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**TRANSPORT AND COMMUNICATIONS
IN INDIA
PRIOR TO STEAM LOCOMOTION**

Transport and Communications in India Prior to Steam Locomotion

VOLUME I: LAND TRANSPORT

80831

JEAN DELOCHE

*Translated from the French
by*

JAMES WALKER



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In the present English edition, the author has incorporated the results of his own researches made since then in different articles and books concerning road engineering, works providing amenities to wayfarers, modes of transport, development of boat structures, along with some other studies on nautical technology written for the greater part by his colleagues of the CSIR-NISTADS project on *Indigenous traditions of Indian Navigation*. These titles will be found in the bibliography preceded by an asterix.

Preface

'A book without a Preface, now a Days, is as unfashionable as a Lady to pretend to be dressed à la mode without a Hoop, or a nice Beau, without a Snuff-box; therefore I am resolved to be in the fashion at any rate.'

(A. Hamilton, *A New Account of the East Indies*, 1744, vol. I, 111)

It is 'fashionable' today, at the outset of most serious works, that the author comments on his reasons for undertaking the work and his research methods. We willingly conform to this custom; all the more so, as there was at the beginning of this study, some thirty years ago, an actual experience which we, in a few words, wish to relate.

During the course of several years we journeyed, walking or by bullock cart, throughout this immense country, covering thousands of kilometres: during the torrid heat of summer, wending along the paths of the Himālaya, during the cool season, following the trails of Rājasthān or treading the paths shaded by coconut palms in Kēraḷa; coming here to a halt at a shelter for pilgrims, there, at the ruins of a Mughal palace serving now as a stable for buffaloes. We ardently loved the Indian roads, and fondly preserve descriptions of these in small exercise books. One day we gave a talk for the French unit of All India Radio regarding the old road from Dehlī to Āgrā, with its *kos-mīnār*, its caravanserais, its red mausoleums. A lengthy passage was dedicated to the picturesque stage from Mathurā to Vṛndāvana, and to the dances of the villagers, at night, in the low-lying jungle alongside the Jamunā. This broadcast was entitled: 'The Indian Road'!

This is not the place to indulge nostalgically in one's youth, but we felt it appropriate to at least mention this incident which probably determined the orientation of our research at the time of our second sojourn in this country. We then set forth with naivety and enthusiasm on a vast subject at the junction of several disciplines: *the impact of roads on Indian civilization*. Another adventure which was to correspond to a deep aspiration; for today, after more than fifteen years of work, the 'ways' of India still interest us.

This ambition, however, was inordinate. After having made a scrupulous survey of the sources, provided our files with an imposing bibliography and filled several dossiers,¹ we came to realize that to

1. A portion of this work has already been published in *Recherches sur les routes de l'Inde au temps des Mogols (Etudes critique des sources)*, 1968.

clear the path into so many virgin zones was a pursuit surpassing the possibilities of an individual synthesis and could only be the fruit of a collective labour. We had to envisage a more modest study, limited to the technical aspects of transport and communications in India *prior to steam locomotion*.

We have intentionally chosen this somewhat vague formula; whereas, it would perhaps have been more appropriate to have said: transport and communications in India *during the Mughal period*, as the greater part of our documentation corresponds to that era. However, in this domain there exists no clear-cut circumscription based upon chronological division. Such specification has no significance as pertains to the development of transport techniques. Thus, bullock carts and boats did not suddenly appear with the Muslim sovereigns; they existed well before. In order to know their history, to determine if and to which extent their form or their utilization had evolved, it was necessary to search in the most distant past for pertinent written or iconographic documents; and, as well, to employ the investigations made by Europeans at the close of the eighteenth and beginning of the nineteenth centuries – precious source of information which has been widely exploited in this work. By the same token, the Mughal roads respond to antecedent communication needs; their disposition evolved afterwards as a result of the attraction emanating from colonial metropolises. One could not remain unaware of the sources which record ramifications of old, nor neglect the documents of the European *companies*.

It is only proper to bring together these extremely diverse facts and accounts, that they shed light one upon the other, should one wish to go beyond the purview of sporadic study; for each given response posed one or several queries demanding to be taken up once more and completed by other investigations. A sufficiently wide range of comparative facts is therefore imperative in order to obtain fruitful results.

Let us add that this research into the past has been, as it were, enriched through the daily observation of the country and the people.

It would be necessary at this point to express our gratitude to all those who, near or distant, have participated in this work. They are innumerable and, rather than present a list of names which would inevitably be incomplete, we prefer to convey to them collectively our cordial acknowledgement.² In particular, we wish to express our gratitude and affection to those most humble people who, in towns and villages, always received us with that kindness, the secret of which the people of India possess, making us feel everywhere that we were one of their own.

'Yatum ūrē, yāvarum kēlir' (PuRanāNūRu, 192)

2. The line drawings illustrating this study were made by the draftsmen of the French Institute of Pondicherry.

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Abbreviations

<i>Ā'in</i>	Abū'l Fazl, <i>Ā'in-i-Akbarī</i> .
<i>A.D.G.</i>	<i>Assam District Gazetteers</i> .
<i>A.R.B.</i>	Patil, <i>The Antiquarian Remains of Bihar</i> .
<i>A.S.R.</i>	<i>Annual Reports, Archaeological Survey of India</i> .
<i>B.D.G.</i>	<i>Bengal District Gazetteers</i> .
<i>Bal.D.G.</i>	<i>Baluchistan District Gazetteers</i> .
<i>B.D.C.R.I.</i>	<i>Bulletin of the Deccan College Research Institute</i> .
<i>B.E.F.E.O.</i>	<i>Bulletin de l'École Française d'Extrême-Orient</i> .
<i>B.O.D.G.</i>	<i>Bihar and Orissa District Gazetteers</i> .
<i>Bombay Gazetteer</i>	<i>Gazetteer of the Bombay Presidency</i> .
<i>Cahār Gulšan</i>	Caturman Rā'i, <i>Cahār Gulšan</i> .
<i>C.I.S.G.</i>	<i>Central India State Gazetteers</i> .
<i>C.P.C.</i>	<i>Calendar of Persian Correspondence</i> .
<i>C.P.D.G.</i>	<i>Central Provinces District Gazetteers</i> .
<i>C.S.R.</i>	Cunningham A., <i>Archaeological Survey of India, Reports</i> .
<i>D.G.U.P.O.</i>	<i>District Gazetteers of the United Provinces of Agra and Oudh</i> .
<i>E.B.(A.)D.G.</i>	<i>Eastern Bengal (and Assam) District Gazetteers</i> .
<i>E.F.</i>	<i>English Factories</i> .
<i>E.T.</i>	Foster W., <i>Early Travels in India</i> .
<i>Hobson-Jobson</i>	Yule and Burnell, <i>Hobson-Jobson</i> .
<i>Hunter, S.A.B.</i>	Hunter W., <i>Statistical Account of Bengal</i> .
<i>I.A.R.</i>	<i>Indian Archaeology, a Review</i> .
<i>I.E.S.H.R.</i>	<i>Indian Economic and Social History Review</i> .
<i>I.G.</i>	<i>Imperial Gazetteer of India</i> .
<i>I.G.J.</i>	<i>Indian Geographical Journal</i> .
<i>J.A.S.B.</i>	<i>Journal of the Asiatic Society of Bengal</i> .
<i>J.B.B.R.A.S.</i>	<i>Journal of the Bombay Branch of the Royal Asiatic Society</i> .
<i>J.I.H.</i>	<i>Journal of Indian History</i> .
<i>J.O.I.B.</i>	<i>Journal of the Oriental Institute, Baroda</i> .
<i>J.P.A.S.B.</i>	<i>Journal and Proceedings of the Asiatic Society of Bengal</i> .
<i>J.P.H.S.</i>	<i>Journal of the Punjab Historical Society</i> .
<i>J.R.A.S.</i>	<i>Journal of the Royal Asiatic Society</i> .
<i>J.R.G.S.L.</i>	<i>Journal of the Royal Geographical Society of London</i> .
<i>L.A.M.B.</i>	<i>List of Ancient Monuments of Bengal</i> .
<i>L.A.M.B.O.</i>	Kuraishi, <i>List of Ancient Monuments in the Province of Bihar and Orissa</i> .
<i>L.A.R.C.P.B.</i>	Cousens, <i>List of Antiquarian Remains in the Central Provinces and Berar</i> .
<i>L.A.R.N.T.</i>	Cousens, <i>List of Antiquarian Remains in his Highness the Nizam's Territories</i> .
<i>M.A.I.N.W.P.O.</i>	Führer, <i>Monumental Antiquities and Inscriptions in the N. W. Provinces and Oudh</i> .
<i>M.A.S.B.</i>	<i>Memoirs of the Asiatic Society of Bengal</i> .
<i>M.D.G. or M.D.M.</i>	<i>Madras District Gazetteers or Madras District Manuals</i> .

<i>M.G.</i>	<i>Manual of the Administration of the Madras Presidency, vol. III, Glossary.</i>
<i>Mir'ât-i-Ahmadî</i>	'Alî Muḥammad Khân, <i>Mir'ât-i-Ahmadî</i> .
<i>M.J.L.S.</i>	<i>Madras Journal of Literature and Science.</i>
<i>Mysore Gazetteer</i>	<i>Mysore Gazetteer</i> , ed. C. Hayavadana Rao.
<i>N.W.P.G.</i>	<i>Statistical, Descriptive and Historical Account of the N.W. Provinces of India.</i>
<i>O.H.R.J.</i>	<i>Orissa Historical Research Journal.</i>
<i>P.D.G. or P.S.G.</i>	<i>Punjab District Gazetteers or Punjab State Gazetteers.</i>
<i>Rennell, M.I.N.</i>	Rennell J., <i>Map of the Inland Navigation, in Memoir of a Map of Hindoostan.</i>
<i>R.L.A.R.B.P.</i>	Cousens, <i>Revised Lists of Antiquarian Remains in the Bombay Presidency.</i>
<i>Seir Mutaqherin</i>	Ghulām Ḥusain Khân, <i>Seir Mutaqherin.</i>
<i>Thornton, G.C.A.I.</i>	Thornton E., <i>Gazetteer of the Countries Adjacent to India.</i>
<i>Thornton, G.T.E.I.C.</i>	Thornton E., <i>Gazetteer of the Territories under the Government of the East India Company.</i>
<i>Tûzuk</i>	Jahāngīr, <i>Tûzuk-i-Jahāngīr.</i>

Transliteration

Indian words have been transliterated (in italics) following current practice, with the designation of the pertinent language (Sanskrit, Hindūstānī, Tamil, etc.) both in the text and in the index. As regards toponymy, we have as far as possible adopted the orthography of the various regional languages;¹ however, to avoid confusion, we have, whenever necessary, indicated in the index the form as given on the official Hindī maps and in the publications of the *Survey of India* (English transcription). Examples: Kalikātā, Kalkattā, Calcutta; Tañcāvūr, Tañjāvūr, Tanjore, etc.

Abbreviations used: Ar., *Arabic*; Assam., *Assamese*; Beng., *Bengali*; Bih., *Bihārī*; Guj., *Gujarātī*; H., *Hindūstānī*; Kan., *Kannāḍa*; Kaś., *Kaśmīrī*; Mal., *Malayālam*; Mar., *Marāṭhī*; Nep., *Nepālī*; Or., *Oṛiyā*; Panj., *Pañjābī*; Pers., *Persian*; Skt., *Sanskrit*; Sind., *Sindhī*; Sinh., *Sinhalese*; Tam., *Tamil*; Tel., *Telugu*; Tib., *Tibetan*.

1. Among those documents consulted, in which the place-names are noted in the regional language scripts, we shall mention: *M.G. and Alphabetical List of Villages in the taluks and districts of the Madras Presidency*, in which the names of villages in the former Madras Presidency are given in characters of the *Kannāḍa*, *Malayālam*, *Tamil* and *Telugu* languages; *Alphabetical List of Villages*, published by the government of Tamil Nāḍu, in which the village names are noted in Tamil script; *Gujarat State Gazetteers, Broach District* (1961), *Rajkot District* (1965) and *Surat District* (1962), which provide lists of towns and villages in the respective districts in *Gujarātī* characters; Bhāratiya Janagāṇanā 1961, *Mahārāṣṭratil Khedyāncī va Saharāncī Varna Kramī*, in which a list of towns and villages is given in *nāgarī*, and *C.I.S.G., Gwalior State*, vol. I, part III, where the towns and villages of the former Gvāliyar State have been noted in *nāgarī*.

Further are to be mentioned the *dictionaries* and *lexica* of the different Indian languages (too numerous to be cited in the bibliography), as well as the *atlases* and *maps* of the present Indian states, printed in the regional scripts, which we have collected at the French Institute of Pondicherry.

Introduction

The transport revolution in India, despite the importance placed upon roads by the *Maurya* and the *Mughals*, did not take place in the third century B.C. under *Aśoka*, nor in the sixteenth century A.D. during the reign of *Śer Śāh*; rather, its advent was to await the mid-nineteenth century. *Previous to that time*, natural agents were employed, the energy of man and animal on land, the motive force of wind on water; *afterwards*, steam power was implemented. The pace of the transport means had remained unchanged since remote antiquity; then, within half a century, it was to increase at an unimaginable rate.

What, then, was the practical magnitude of the distances on this subcontinent comprising some four million square kilometres, equivalent to the surface area of Europe (Russia excluded)? For those of an earlier age, India was at least twenty times¹ — and, following season or circumstance, perhaps thirty, forty or even one hundred times — larger than it is today. Which means were available to overcome the vast distances? We shall attempt to respond to this question by successively analysing land transport and water transport, which will enable us to evaluate the creative forces of travel and communication.

In this first volume, we shall consider the road network, then discuss questions pertaining to the construction and organization of the main roads, and conclude with an examination of the modes of transport.

1. At the close of the previous century, McGeorge (*Ways and Work*, 221) calculated that the railways had reduced the size of India by twenty times, and that in 1894, one thus covered a distance of 400 miles in the same time in which one had 100 years earlier travelled only 20 miles.



I

THE ROAD NETWORK

The road network is a complex system of routes and paths that connect different parts of a country or region. It is a vital part of the infrastructure that allows people and goods to move from one place to another. The road network is a complex system of routes and paths that connect different parts of a country or region. It is a vital part of the infrastructure that allows people and goods to move from one place to another.

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1. A Geographic and Human Choice

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The existence of a road network necessarily implies the collaboration of nature and man, and corresponds therefore to a geographic and human choice. It would appear at first that the very structure of the country inevitably determines the system of communications. Natural obstacles compel land transit to follow the lines of least resistance, to take the most convenient passages, and contribute to the establishment of roads along well-defined trails. One thus understands that certain valleys would have channelled trade at a very early stage, that certain passes would have been frequented from an early date, that ways of passage would have retained their importance throughout history, and that the old routes would have been firmly entrenched in the earth. In India, perhaps more so than elsewhere, the historian cannot fail to be struck by the permanence of certain lines of communication that have persisted over the centuries; new roads regularly follow old paths, as if land transit had never been able to elude the determinism of geographic factors.

The Role of Nature

Would nature alone offer a sufficient understanding of that living organism formed by the network of roads?

The subcontinent is clearly demarcated from the rest of Asia by its high rampart of mountains, permitting of passage only at certain well-established points. To the east, the Burmese chain, no doubt as a consequence of the covering of dense forests, has been virtually a barrier to passage, and contact between the east of India and the Irāvadī basin was made by way of sea.¹ The prodigious Himālaya range bordering on the Plateau of Tibet, despite its altitude, is not insuperable; many paths turn into the incisions made by the rivers along the line of ridges, and these breaches indenting the mountain chain have always served as links between the southern slopes and the highlands of Central Asia. The western edge of the Irānian ranges, with its long ramparts of calcareous sierras, where watering places are scarce, is more open to general transit; its famous gates have been traversed without cessation since most ancient times. Thus, the obstacles of the

1. Even today overland connections between India and Burma are limited: the Arākān mountains are not traversed by any railway line (and, until 1944, no land route existed).

mountainous border, giving rise to the concentration of trails and paths at propitious locations, require men to always proceed to the same places, to follow the ways opened by their precursors.

Within these limits, the obstacles represented by the relief are irregularly distributed. The map brings to view the vast crescent of alluvial tracts extending from the delta of the Gaṅgā to that of the Indus, an ensemble of plains bearing a remarkable uniformity and offering natural possibilities to land travel. The Peninsular Plateau, consolidated very long ago and having the aged topography of regions subjected to protracted subaerial erosion, being a formation of highlands inclined from west to east in which appear large, deeply carved rivers (Mahānadī, Godāvarī, Kṛṣṇā, Kāvēri), is also, although to a lesser degree, favourable to the advances of men. The only obstacles are the bare reliefs of the Arāvalī Range, the fault scarps framing sunken basins of the Narmadā and the Tāptī, and the steep slopes of the Western Ghāṭs carved into the basalts and crystalline rock; even though they be difficult, less by reason of their altitude than the harshness of their cliffs. The Western Ghāṭs have only an average altitude of 1,000 to 2,000 metres, but they rise rapidly in the form of very steep slopes and, whether in the trap rock north of Govā (Goā), or in the gneiss and granite of the old platform, their west side is always precipitous and forms often a barrier, excepting those locations where the ridge-line slopes downward and where it is dissected by passes. These naturally dictated passages, the most important of which is the Pālakkāṭu (Pālghāt) Gap, have been persistently followed over the ages. Nowhere else is to be encountered such an excess of slopes. Neither the aged and worn mountains of the Arāvalī Range, nor even the heterogeneous ridges of Central India present great difficulties, because their bastions and rocky spurs are carved lengthwise and transversely with valleys. Hence, the relief, excepting perhaps the length of the West Coast, represents no veritable obstacles.

It would seem that the arid zone extending to the west of the Arāvalī Range, with its sands that progressively cover the substratum of ancient rock, would have been particularly unfavourable to human interrelation. In the solitudes of the Thār, resultant of the absence or the dearth of shallow waters, the wells are generally briny and become increasingly deeper as one proceeds farther south-west; it is towards these waters that the trails make their ways. Nevertheless, except in the deep sands which form a strip to the west of Jaisalmer, almost everywhere the plants and shrubs restraining the sands, and depressions and ponds lend themselves to the alimentation of cattle. Thus, the Thār does not represent a hindrance to passage comparable to that of the Sahara; all the less so, because this region was formerly less arid (hence more accessible), as is borne witness by a hydrographic network which only recently was obstructed by sands.

The constraints which land communication was bound to undergo were particularly severe in the low-lying zones furrowed by rivers, such as the deltas of the Godāvarī, the Kṛṣṇā, the Kāvērī, and of the Indus, with their innumerable distributaries; the plain of Oṛīsā regularly menaced by the inundations of the Mahānadī; the enormous Baṅgāl delta covered with old stanchèd beds, alluvial folds periodically pierced by the various arms of the Gaṅgā or the Brahmaputra; and, finally, the long and narrow western coast traversed by hundreds of rivers, like so many grooves running down the Ghāṭs, to terminate at the sea in a series of estuaries.

But, more than the mountains, the desert or the rivers, the forest would appear to have been a major barrier to the overland movements of men. Prior to the intensive deforestation begun in the nineteenth century, the forest cover in India was appreciably more extensive.² This is clearly to be understood from the ancient texts;³ and Hsüan-tsang, who in the middle of the seventh century journeyed through the country, repeatedly mentions in his accounts the interminable jungles hostile to intercommunication.⁴ Even during the Mughal period vast forest zones posed serious problems to the wayfarer.

To begin with, the northern border was much less penetrable than is now the case. In East Baṅgāl and in Āsām the wooded tracts covered a considerable surface area. At the foot of the Himālaya, the tarāī formed a continuous massif, from Haridvār to the Brahmaputra, which in places overlapped deeply into the Gangetic Plain.⁵ The other great hindrance to land travel, apart from the vast forests covering the Western Ghāṭs,⁶ was the enormous wooded zone in the highlands of

2. As shown by Legris (*La végétation de l'Inde*, 349-50), the intensive exploitation of forests was begun at the close of the eighteenth and beginning of the nineteenth centuries, following upon the creation of large coffee and tea plantations and the systematic utilization of timber. The exploitation was accelerated after the 1857 rebellion and the construction of the railway system towards 1860; to such an extent that presently the forests subject to forestry regulation comprise only approx. 22 percent of India's surface area, with however higher percentages in places (approx. 40 per cent in Madhya Pradesh, and more than 70 percent in the district of Bastar).

3. Vide B.C. Law, *Historical Geography* 40-1; Srivastava, *Trade and Commerce*, 6 and n. 2.

4. Watters, *On Yuan Chwang's Travels*, vol. I, 365, 372; vol. II, 20-3, 45, 196, 198, 200, 209, 214, 224, 226, 237, 239.

5. Vide the references given by Habib in *Agrarian System*, 10-1, 13, 15-6. Concerning the tarāī, vide Tavernier (*Travels*, vol. II, 204-7) whose testimony is confirmed by Map X of the *Bengal Atlas* of Rennell (1781), as well as by the accounts of Falconer (1825), cited by Legris, *op. cit.*, 346.

6. Concerning the Travancore forests, vide Tavernier, *Travels*, vol. I, 194-303; concerning the region east of Govā (Goā), Carré, *Travels*, vol. I, 221-7, and Careri, *Travels*, 207 sq.

Central India. To the east of the Arāvalī Range, the country was partitioned by dense jungles. In the Vindhya and the Sātpurā no real deforestation had as yet occurred. The forests spread eastwards as far as the Kaimūr mountains which come to an end almost at the Gaṅgā, opposite Mīrzāpur. The ridges of Choṭā Nāgpur which dominate the eastern plain, called *Jhārkhaṇḍ* (thicket land) by the Muslims, were impenetrable. The western border of Orīṣā was scarcely more favourable, with its jungles infested with savage animals. As regards Bastar, at present still the most heavily wooded district in India, it was a cuirass fending off passage.⁷ These forests, which formerly had been places of refuge and have preserved very old modes of life, appear today like museums of early cultural forms. One understands, consequently, that travel would have been precarious in these regions,⁸ and that the *great currents of civilization would have circumvented them by peripheral routes*, in particular by passing along their western fringe. This is a fact of fundamental importance in the development of Indian civilization.

The Role of Man

But, nature alone is not responsible; men have also had a part to play. A very direct relation exists between roads and human settlements. Hamlets, villages, cities are not merely seeds of life, but also centres, knots, points of convergence where the currents of land transit culminate, and from which they set forth. It is possible, based upon the recent work of archaeologists, to glimpse in broad outline the history of these human settlements in India.

The beginnings of road development in India, as elsewhere, become lost in the mist of time. Men probably had begun to follow the tracks of the large migratory herbivores, taking advantage of topographical irregularities and choosing established and well-defined landmarks. The penetration of territory was primarily effectuated by way of the rivers. The map of the stone-age sites⁹ indicates that the vestiges of paleolithic occupation stretch along the large rivers of India. More than

7. Vide, on the forests of the Cambal country and the Mukandvārā Pass at the beginning of the eighteenth century, T. Roe, *Embassy*, 329-42; on those of the Vindhya and Sātpurā Ranges, in 1579 and in 1630, Monserrate, *Mongolicae Legationis*, 14, and Mundy, *Travels*, vol. II, 51-6; on the Bundelkhaṇḍ and the wooded margins, *Bābur-nāmā*, vol. II, 448, and Sarkar, *Hist. of Aurangzeb*, vol. I, 11; on the Choṭā Nāgpur jungles, Sarkar, *Mir Jumla*, 154; on the Orīṣā border, *C.P.C.*, vol. V, 1978; Motte (1788) and Leckie (1790), in *O.H.R.J.*, vol. I, 1952, app. II, 25 and vol. II, 1953, app. IV, 11-3; on Bastar, Walker, in *M.J.L.S.*, vol. XVI, 1850, 233.

8. Vide, in *Asiatic Researches* (vol. VI, 57-191), the travel journal of J. Blunt who, in 1795, journeyed from Cunār to Rājamahēndravaramu.

9. Subbarao, *Personality of India*, 63.

80 sites of microlithic industry have been discovered in Gujarāt, dispersed in the valleys of the Narmadā, the Mahī and of the Sābar-matī.¹⁰ Excavations have revealed that these sites are generally mountain spur or dune settlements¹¹ favourable to intercommunication because they constituted the junctions of paths from which, following the valleys, the population diffusion could proceed. Prehistoric land crossing thus would appear to have been linked with the river valleys which were points of reference and routes of penetration.

A coherent network begins to appear with the progressive urbanization of the great plains to the north of the Peninsular Plateau. As of the third millennium, the brilliant Indus Civilization was invested with communication routes following the river arteries to the delta, before branching towards the Gulf of Khambhāt, traversing the Kāthiyāvāḍ Peninsula.¹² The arrival of 'new' populations in the Gangetic basin, towards 1500 B.C., is accompanied by the conquest of lands suitable for cultivation and pasturage, at the expense of the forest. This process seems to have been progressively continued in the direction of the Deccan lava fields; to be followed between the fifth and third centuries B.C. by a vigorous urban thrust, as evidenced by archaeological excavations in the north-east, the Gaṅgā Valley, the Mālava and the Mahārāṣṭra plateau.¹³ These are the settlements, developed by successive generations, which have contributed to the establishment of land routes advancing from the mid-basin of the Gaṅgā towards the valleys of the Narmadā and the upper Godāvarī, which bifurcate thence towards the deltas of Āndhra, avoiding thus the centre of the peninsula. The region of the Gulf of Khambhāt would appear to have been throughout this entire period a very active centre of exchange, and it is in such wise that Hindusthān would have participated in the prevailing life of the Indian Ocean.

No activity of this order is to be observed in the Goṇḍvānā, prior to the modern period, which would have been able to attract the great currents of land traffic. The isolation of this region is not only connected with the presence of natural obstacles, but is also to be viewed in the context of land clearing for cultivation. The Nāgpur plain would have been able to play a much less lack-lustre role, had man so decided.

In a word, it appears that a *cementation* of the diverse regions of India had taken place during the protohistoric period, and that this process had neared completion at the dawn of historic times, when the *Maurya* founded the first Indian empire. The trails linking their provincial metropolises spread perhaps in numerous ramifications; they

10. *Ibid.*, fig. 18, p. 70.

11. *Ibid.*, 71.

12. Allchin, *Birth of Indian Civilisation*, 127-9.

13. Wheeler, *Early India*, 118-9; Allchin, *op. cit.*, 215-20.

constituted, nonetheless, the clearly defined axes of land transit, a veritable network which has served throughout the centuries as a model for all the great sovereigns down to Aurangzeb.¹⁴

It is according to this scheme that we shall undertake the regional analysis of communication routes. For the convenience of exposition and to better follow the destiny of the various routes, we shall distinguish several large zones of communication: the Himālayan border, the North-West, the Gangetic Plain and the eastern margins, the country situated between the Gaṅgā and the Gulf of Khambhāt, the transversal band connecting the Tāptī and the deltas of Āndhra, the South of the peninsula, and finally, the Goṇḍvānā.

14. Vide the maps of the ancient road links which we have collected in our *Recherches sur les routes de l'Inde*, pls. I-X.

2. The Himālayan Border

We shall begin our study with the mountainous border. The Himālaya, 'abode of snow', has forever awakened in man an extraordinary fascination by dint of its august chain of fold mountain ranges with their formidable passes, its summits which are the loftiest on earth, the isolated valleys which have served as refuge for people of the lowlands; and, finally, through its mystery.

Indian literature extols the Himālayan peaks, where dwell the gods, and their sacred waters fecundating the plains. Mount Kailāśa, Lake Mānsarovar, Amarnāth, Badrināth, Paśupatināth have attracted since time beyond memory innumerable pilgrims: a religious peregrination which throughout the course of history has furthered the contacts between India, Central Asia and China.¹

The Gates of the Western Himālaya

The passes of the Hindūkuś, the Pāmīr and of the Karākoram ranges to the west of the chain, have been traversed from a very early date. It was by way of these passages that Indian Buddhism penetrated China.²

1. The history of the Himālayan trails is not well known. Those having travelled along them throughout the centuries have not transmitted accounts, with the exception of a few Chinese pilgrims during the period between 400 and 700 A.D. Only Kaśmīr, and to a lesser degree Nepāl, have preserved to an extent the memory of their past. Certain European travellers, such as Bernier, Tavernier, Marshall, who attempted to procure information regarding the routes followed by trade caravans, obtained, however, but summary information. The missionaries, Jesuit and Capuchin, who dared to venture across the mountain folds (more, it is true, out of evangelic fervour than curiosity), have sometimes described their experiences. The documents they have left enable that the major passages taken in the seventeenth and eighteenth centuries be re-discovered. Excepting the North-West, where the trails of the Hindūkuś and the Pāmīr led to Turkeṣtān, the routes between Āsām and Kaśmīr all emerge at the great West-East axis of the Indus - Tsan-po furrow. The old maps of the Himālaya have been reproduced by Sven Hedin in *Southern Tibet*, vols. I-II. European geographers entertained rather vague notions concerning its relief. With *Mount Imaus* or *Taurus* or *Caucasus* they designated a chain of mountains extending from west to east and crossing all of Asia to include the true Taurus, Elburz and Himālaya. Even at the close of the eighteenth century, Orme (*Hist. Fragments*, 457) still thought that the Himālaya was a continuation of the great Caucasus.

2. The rugged trails of the Western Himālaya thus have ensured the transmission of one of the loftiest speculations of the human spirit. A fact that ridicules the simplistic explications of geographic determinism, for it is precisely in this zone

From the oases of Turkeṣtān³ various routes led to India. The pilgrims having come from the Oxus Valley pressed their way through the defiles of the Hindūkuṣ; a massif nevertheless of such height that 'even the birds in their migrations cannot continue their flight and have to descend and walk',⁴ and of such breadth that a twelve-day foot march is required to reach the farther end of its deep gorges. The travellers debouched into Bāmiyān, whence advancing through the Ghorband Valley they joined the main trunk road. Another itinerary, shorter, followed the Tāghdumbās Pāmīr and crossing the Kilik Pass continued on through Hunzā and Gilgit to reach the Indus Valley. The most direct route, however, passed through the Karākoram, Leh, Zoḡi-Lā and the Vale of Kaśmīr.⁵

It is quite likely that these monks and pilgrims were accompanied by merchants. In any case, after Kābul had become, in the eighth century, the Afghān metropolis, the western gaps channelled commercial traffic originating in Turkeṣtān. At the time of Bābur, the Hindūkuṣ was criss-

that the mountainous obstacle is the greatest; a fact which furthermore demonstrates that few physical barriers are able to resist human will, when the fulfilment of a fundamental need is implicated.

3. The hydrographic conditions at the western extremity of the Gobi Desert during the first centuries of the Christian era differed appreciably from those of today, and in Chinese Turkeṣtān the oases bordering the rivers supported irrigated cultures enabling the development of flourishing towns which became also centres of Buddhism. Regularly visited by pilgrims, these have since been buried beneath the sands (vide the reports of the Stein Aurel excavations, in particular *Ancient Khotan, Detailed Report of Archeological Explorations in Chinese Turkestan*, 2 vols, 1907; *Ruins of Desert Cathay, Personal Narrative of Explorations in Central Asia and Westernmost China*, 2 vols., 1912).

4. As said Hsüan-tsang (Watters, *On Yuan Chwang's Travels*, vol. II. 267).

5. During the fourth century, Chinese monks, about whom little is known, journeyed to India to acquire and take back with them scriptural manuscripts. In the year 400, the pilgrims began to make their way in greater number not only to Central Asia, but into India itself; amongst whom Hui-jui (355-409) might be mentioned, as well as Pao-yun, who went as far as Puruṣapura (Peśāvar), and Fa-yung who, in 420, followed the Kaśmīr route where it would appear that many of his monks remained for a lengthy period of time. From this first generation of pilgrims, the only account to have survived intact is that by Fa-hsien, who arrived in Uḡḡiāna by way of Khotan, Kāśgar and Dardistān. Then, in the sixth century the movement of Chinese pilgrims in India seems to have slackened; but, under the *Tang* an exceptional traveller, Hsüan-tsang, took the trail from Bactra and debouched via Bāmiyān into Kapiśa, Gandhāra and the Indus basin. From the ninth century onwards the process of decay of the *Tang* dynasty entailed that of Buddhism, and to the extent to which Chinese colonization collapsed, the routes of Central Asia closed to the Chinese: that was the end of the pilgrimages. It should also be noted, that in the seventh century a certain number of monks followed the route from Tibet, but it was soon closed for political reasons (vide Demiéville, 'Les sources chinoises', in *L'Inde classique*, vol. II, 399-409).

crossed by caravans during the fair-weather season. The conqueror gives in his memoirs a list of the seven large passes linking the capital city with Balkh, Qūndūz and to Badakhshān, and by way of which traders of Central Asia ventured to supply the Kābul bāzār.⁶

Farther to the east, the Pāmīr and Karākoram passes have remained the northern gates of Kaśmīr; however, only scant information is available concerning them.

The route which led from Lake Volur to Āstor, or via Gurez to Skārdū on the Indus, mentioned by Wu-k'ung in 759, was regularly taken by the Dard traders prior to the construction of the Gilgit road by the English.⁷ Until 1638, according to Bernier,⁸ the caravans which travelled each year from Kaśmīr to Kāšgar followed this course, and from Skārdū continued on to Yārkand by way of the Bāltoṛo glacier.⁹

The easiest way to Ladākh (and farther onwards in the direction of China or Tibet) crossed the Zojī-Lā Pass, at 3,400 metres the least high of the western Great Himālaya, proceeded through the Drās Valley and, bifurcating at Kārgil, arrived at Leh.¹⁰ This is the route followed by Désidéri in 1715, when he journeyed from Śrīnagar to Lha-sa.¹¹ At Leh, various routes converged: to the south-east, that traversing the Tsan-po Valley; to the east, that arriving from Rudok by way of which the Mongol Sopko tribe advanced in 1686-87 to invade Ladākh;¹² to the north-west, the Bāltistān route which ran alongside the Indus¹³ and enabled the Muslims of 'Alī Śer to conquer the country in 1600. But, the most important has always been the northern route which crossed

6. These are, from east to west, the Khavāk, Tūl, Pārandī, Bāj-gāh, Valiān, Cahār-dār and Śībar-tū passes (*Bābur-nāma*, vol. I, 202, 204-5 and n. 4; *Ā'in*, vol. II, 405). In 1603, Bento de Goes, en route to Kāšgar, passed through Pārvān and Bāj-gāh (Wessels, *Early Jesuit Travellers*, 16-24). Vide the detailed and lively description of the Hindūkuś passes given by Foucher in *La vieille route* (vol. I, 17-28, and map, fig. 6), as well as Holdich's sketch (*Gates of India*, f.p. 500).

7. He crossed the Dudakhut (Dugdhaghāta) Pass, approx. 13 km east of the Rāzdianḡan pass, traversed today by the 'Gilgit Transport Road', which was constructed by British engineers (Stein, *Memoir*, 19, 89-90).

8. Bernier, *Travels*, 425-7. It was in 1638 that Śāhjahān sent an expedition, led by 'Alī Mardān Khān, in the direction of Tibet; it miscarried. The sovereign of Tibet, however, so as preclude any further surprise, forbid access to his territory by way of Kaśmīr.

9. This itinerary has been long since abandoned, the passage having been obstructed by glacial drift.

10. Several invaders have crossed this pass, amongst whom Mīrzā Muḥammad Haidar in 1532 (vide Stein, *Memoir*, 92-3). This passage was developed in 1834 following the conquest of the country by Zorāvar Singh, who systematically constructed bridges over the rivers (Cunningham, *Ladāk*, 148-50).

11. Wessels, *Early Jesuit Travellers*, 210-22, 225-69.

12. Cunningham, *Ladāk*, 157-9.

13. During the summer risings of river-levels resultant of snow melt, travellers coming from Skārdū preferred to follow the Śyok Valley as far as Corbad, whence

the Karākoram Pass and led to Yārkaṇd and to Khotan, linking the southern side of the massif with China.¹⁴

Contact between the Kaśmīr basin and the Pañjāb was effectuated by diverse routes which deserve a more elaborate presentation.¹⁵

The Routes from Kaśmīr to the Pañjāb

These are much better known than the other Himālayan trails, because the *Kaśmīrī* sources abound in topographic details,¹⁶ and also because the Mughal chronicles have described the ways of access to the valley, where each year the emperors went to reside during the hot season.¹⁷

At the time of Akbar, according to Abū'l-Faẓl,¹⁸ twenty-six different routes led to Hindusthān, of which however only a few were negotiable on horseback.

The natural passage to the Śrīnagar basin is the Jhelam Valley (*Vi-tastā*), but downriver from Bārāmūlā it becomes for a stretch of 80 km a succession of rigorous gorges which were then, as had been the case since most ancient times, guarded by fierce populations. It is probably for this reason that it has not played a principal role in the history of Himālayan travel. Nevertheless, because it is the shortest route between the old Gandhāra and Kaśmīr, and is not of too great an altitude, being the only passage not obstructed by winter snows, wayfarers, as

by way of the Hānu Pass they proceeded to Leh continuing along the Indus (*ibid.*, 162-3).

14. Its course evolved in conformance with glacial movements. In 1812, according to 'Izzat-u'llah, the trail south of the Karākoram Pass followed the bed of the Śyok, but ice masses having accumulated in the river-bed, travellers were obliged to take a more irregular passage, to the west of the former. Thomson followed this trail in 1848 (*ibid.*, 160-2).

15. Among the Himālayan principalities, a special place must be accorded to Kaśmīr, which 'in the heart of Asia sinks like a wedge under the force of India, but bound to India has shared her destiny' (Lévi, *Népal*, t. I, 6).

16. The indigenous sources, in particular Kalhaṇa's *Rājatarāṅginī*, offer an abundance of information concerning ancient Kaśmīr. They have been studied by Stein in his remarkable *Memoir on Maps Illustrating the Ancient Geography of Kaśmīr*. Nothing comparable is available pertaining to the rest of India.

17. 'It is not indeed without reason that the Mogols call Kachemire the terrestrial paradise of the Indies, or that Ecbar was so unremitting in his efforts to wrest the sceptre from the hand of its native Princes. His son Jehanguyre became so enamoured of this little kingdom as to make it the place of his favourite abode, and he often declared that he would rather be deprived of every other province of his mighty empire than lose Kachemire' (Bernier, *Travels*, 1891 edition, 401). Vide the descriptions given by Jahāṅgīr in his memoirs (*Tūzūk-i-Jahāṅgīrī*, in particular vol. II, 143-4, 162-3, 273-4).

18. *Ā'in*, vol. II, 351.

for example Hsüan-tsang and Wu-k'ung, have followed it from a very early date.¹⁹ Al-Birūnī was acquainted with it. The route most likely passed through the vicinities of Abbottābād and Mansahrā, whence, across the Kunhār and the Kiṣāṅgaṅgā, it reached Muẓaffarābād, then continued along the right bank of the Jhelam as far as Bārāmūlā, from where, after having traversed the river, it arrived at Śrīnagar.²⁰

During the Mughal period it was called the *Paklī route* because it crossed the *sarkār* of the same name.²¹ It linked up with the main trunk road at Ḥasan 'Abdāl to the west of Rāvalpiṇḍī.²² The emperors or their agents travelled that way when the other passages were closed.²³ It did not, however, attain to a military and commercial importance until a relatively recent period subsequent to the Afghān conquest, as of the second half of the eighteenth century, being as it then was the most convenient way from Kaśmīr to Peśāvar.²⁴ At the close of the nineteenth century the strategic significance of Kaśmīr in the context of the Anglo-Russian rivalry obliged the British to construct a road suitable for vehicles from Rāvalpiṇḍī to Śrīnagar, the *tonga road*, proceeding past the summer station at Marī and along the left bank of the Jhelam, which then channelled a significant part of the travel between the valley and the Pañjāb.²⁵ Today, between Bārāmūlā and Muẓaffarābād, a road runs along either side of the Jhelam, but only that on the right bank can lay claim to any great age.²⁶

All the other routes leading to the plain must traverse the chain of mountains extending from the Jhelam to the Bānihāl Pass, forming the southern border of the Śrīnagar basin.

The Toṣamaidān Pass was of particular importance during the period of the last *Kaśmīrī* kings because it linked the capital city with their fortified town, Lohara. Hsüan-tsang probably traversed this pass and, in any case, Maḥmūd of Ghaznī did so when he attempted to invade Kaśmīr in 1081, as did Raṇjīt Singh in 1814. The route determined by the Toṣamaidān Pass enabled one to reach without great

19. Vide Stein, *Memoir*, 14-5, 18-9.

20. *Ibid.*, 23-5.

21. *Ā'in*, vol. II, 351; *Tūzuk*, vol. II, 126, 143. It included the region between Kaśmīr and the Indus.

22. Jahāṅgīr followed this route in 1619 and noted in his memoirs the names of the stages (*Tūzuk*, vol. II, 123-39).

23. *Tūzuk*, vol. II, 143; and Rennell, *Memoir* (1792), 135-6.

24. Hugel records a local tradition according to which this road would really only have been opened to travel by the *Paṭhān* 80 years prior to his visit (1835) (cited by Stein, *Memoir*, 83, n. 2). Forster (*Journey*, vol. II, 42 sq.) followed a cross-country track from Muẓaffarābād to Peśāvar, the stages of which are difficult to identify.

25. Begun in 1880, it was completed in 1890 and until the opening of the road from Jammū to Śrīnagar via the Bānihāl Pass, it was Kaśmīr's primary access route.

26. Stein, *Memoir*, 83.

difficulty Pūñch, the regions of the Jhelam and the Indus, and was until the construction of the Rāvalpiñḍī carriageway the passage favoured by traders; even though, by reason of its altitude, the pass was always closed during the winter for a longer period than that of Pīr Pañjāl.²⁷

The latter, at 3,494 metres, of a lesser altitude, led to the valleys of the two Tohī of Rājaurī (Rājapurī) and of Pūñch (Parṇotsa) and had become very early the most frequented passage between Kaśmīr and the Pañjāb, being mentioned often in the *Kaśmīrī* chronicles.²⁸ It was probably in consideration of these natural advantages that Akbar decided to have the imperial road connecting Lāhaur and his summer residence pass that way. It departed from the main trunk road at Gujarāt and led to Śrīnagar by way of Bhīmbar, Rājaurī, the Ratan Pīr Pass, Bahrāmgaḷa, Puṣiyānā, Pīr Pañjāl, 'Alīābād Sarāe and Hīrapur.²⁹

To the north of Ratan Pīr, a branch road led to Śrīnagar, making a detour towards the west via Pūñch, Hājī Pīr (2,508 metres), Urī, and then continued up the left bank of the Jhelam. This passage, traversing passes of lesser altitudes, was never blocked over long periods by snow and for this reason was very much travelled when the imperial road was closed.³⁰

There were at the time of Akbar two other trails. The one led from Rājaurī to Hastivañj (near 'Alīābād Sarāe) by way of the Darhāl Pass and Lake Nandan. This was the way generally taken by soldiers prior to the construction of the imperial road.³¹ The other trail traversed the Tañgtala Pass, some 8 kilometres to the north of Pīr Pañjāl, and was inaccessible to pack animals.³² The old Mughal route nevertheless had remained the most important of Kaśmīr's trade routes until the close of the nineteenth century.³³

27. The old stages of passage would have been: Kārkoṭadraṅga (Draṅg), the Toṣamāidān Pass, Sārambara (Chāmbār), Aṭṭālikā (Mañḍī), Parṇotsa (Pūñch), (Stein, *Memoir*, 79-81).

28. The ancient chronicles record the following stages between the valley and Rājaurī: Śūrapura (Hīrapur), Kramavarta, Hastivañja, Pañcaladhārāmāṭha (Pīr Pañjāl), Puṣiyānānāḍa (Puṣiyānā), Bhairavagala (Bahrāmgaḷa), Rājapurī (Rājaurī) (*ibid.*, 72-9).

29. Some stages of the route have been recorded by Finch (in *E.T.*, 169); a detailed itinerary is to be found in *Cahār Gulṣan* (CV) and in Tieffenthaler's *Descriptio Indiae* (in Bernoulli, *Description*, vol. I, 86-8); vide as well Rennell, *Memoir*, 134-5.

30. This itinerary is mentioned in *Cahār Gulṣan* (CVI); Vide also Rennell, *Memoir*, 138, and Stein, *Memoir*, 86-7.

31. *Ā'in*, vol. II, 332; Stein, *J.A.S.B.*, 1896, vol. 64, 379-80, and *Memoir*, 72-4.

32. *Ā'in*, vol. II, 352; Stein, *J.A.S.B.*, 1896, vol. 64, 379, n. 1, and *Memoir*, 79. It was used by smugglers in the 19th century.

33. The salt of the Pañjāb mines was transported over this trail; Stein (*Memoir*, 75 n. 3) records that at the time of his travels in the Pīr Pañjāl region he encountered daily caravans of oxen loaded with this precious commodity.

A very rugged trail, impassable for beasts of burden, extended farther eastwards, crossing the Sidau (formerly Siddhapatha) or the Būdil Pass, connecting in an almost straight line Śrīnagar and Akhnūr and, consequently, has always been followed by *Kaśmīrī* bearers.³⁴

The Bānihāl Pass,³⁵ at the extremity of the chain, grants access to the valley of the Upper Canāb and to the partitioned regions of Himācal Pradeś. As it is never entirely obstructed by winter snows, it was by this passage that the exchanges between Kaśmīr and Jammū were effectuated. Nevertheless, it appears that the importance of this route would have increased at the time of the dissolution of the Mughal empire, as well as during the *sikh* revolt in the second half of the eighteenth century. The traders, apprehensive because of the insecurity prevailing along the main road on the Indo-Gangetic threshold, made a long detour proceeding along the mountainous border and traversing the eastern passes of Kaśmīr.³⁶ The caravan followed by Forster in 1783 went from Jammū to Śrīnagar by way of Bānihāl.³⁷ Tieffenthaler³⁸ records that there was also some traffic on the trail leading from Kīstavar to the Upper Jhelam via the Marbal Pass to the east.

During the course of the nineteenth century the road from Jammū was neglected; between 1913 and 1915 a minister of the *māhārājā* had a carriageway constructed linking the two regional capitals. It is today the only land route from India to Kaśmīr.

The Gaps in the Ridge-line between Kaśmīr and Nepāl

The mountain chain extending between the basin of the Jhelam and the Śāradā is deeply carved by the high valleys of the Canāb, the Satlaj and of the Gaṅgā, through which one passed to reach the Plateau of Tibet.

A relatively convenient trail joined Maṇḍī and Leh. It advanced up the Byās by way of the Kulu Valley and the Rohtaṅg Pass, then made a detour at Lāhul proceeding along the Candrā-Bhāgā and traversed the Bārā-Lācā and Lācāluṅ Passes before debouching at the Indus. These different passes, despite their altitudes (4,000-5,000 metres) are quite easily accessible from June to the end of October because the slopes in that region are of an even regularity. The Jesuit, Azevedo, made his way through them in November 1631,³⁹ and it was by this route that a

34. Stein, *Memoir*, 71; Drew, *Northern Barrier*, 524.

35. 'Bāṇasālā' in the chronicles (Stein, *Memoir*, 70-1).

36. Forster, *Journey*, vol. I, 190, 245-6.

37. The route which he took followed roughly the same course as that of today.

38. Bernoulli, *Description*, vol. I, 89; concerning ancient travel in this area, vide Stein, *Memoir*, 95-6.

39. Wessels, *Early Jesuit Travellers*, 110-18.

chief part of the trade between Ladākh and Hindusthān was effectuated.⁴⁰

The Satlaj, leaving Tibet through an imposing gorge, forms a long incision which has naturally channelled land transit between the Indian Plain and the furrows of the Indus and the Tsan-po. By means of this rough trail which followed the torrent, one could join directly the Lhasa road to the north-east; or, by continuing up the Spiti basin, reach Leh to the north-west.⁴¹ Inscriptions found near several bridge emplacements attest to the antiquity of travel in this part of the country.⁴²

On the other hand, it is not simply because the Gaṅgā and the Jamunā have cut passages through the mountainous barrier⁴³ that men have since an early date been wont to journey to their sources, but by reason of their being great centres of pilgrimage. Throughout the centuries devout Hindus from all corners of India have made their way along the trails leading to Gaṅgotrī, Kedarnāth, Badrīnāth, and the path they have tread has been followed without remission ever since.⁴⁴

From Haridvār, 'the door of Lord Hari', where the Gaṅgā flows into the plain, the main route hewed a passage in the abrupt river gorges to Devaprayāg, Śrīnagar, Rudraprayāg and Badrīnāth. From there, by way of the Māna Pass, difficult of access and always snow-covered, one came out into the high valley of the Satlaj and the Tibetan side.⁴⁵ The Jesuits, Andrade and Azevedo, ventured to Tsaparaṅg in Tibet by this passage in 1624 and in 1631.⁴⁶

40. Vide the itinerary given by Cunningham (*Ladāk*, 153-6).

41. Cunningham (*Ladāk*, 155-7) has noted the names of the major stages from Rāmpur to Leh; one followed the Satlaj as far as the Vaṅtu bridge, then crossed the mountain at the Tārī Pass to reach the Pin River, Dankhar, the Spiti River and the monastery at Kyi; from there a trail branched off and led to the Bārā-Lācā Pass via Losar, while another traversed the Paraṅg Pass and continued along the Somorārī and So-kar lakes.

42. Francke (*Antiquities of Indian Tibet*, vol. II, 23), at the time of his journey through the Tibetan frontier at the beginning of this century, recorded inscriptions perhaps 1000 years old testifying to the very early use of these trails.

43. The *N.W.P.G.* (vol. XII, 85-98) describes the high valleys situated between the Alakanandā and the Kālī and the difficult passes leading into Tibet.

44. Concerning the pilgrimages to Gaṅgotrī, to Kedarnāth and Badrīnāth, as well as regarding the old Garhvāl and Kumāyūm (Kumaon) routes, vide *ibid.*, 234-7, 556-61, 23-7, 249-51, 414-17.

45. In the same work (582-7) there is a detailed itinerary established on the basis of information provided by explorers at the beginning of the nineteenth century, and as well a good description of the Māna Pass.

46. Wessels, *Early Jesuit Travellers*, 46-63, 95-101. The precincts sacred to Hindus, the high valleys of the Bhāgīrathī and the Alakanandā attracted thus each year during the fair-weather season a significant religious traffic. Azevedo estimated that, anno 1630, approx. 80,000 pilgrims made their way to the *kumbh-melā* at Badrīnāth (*ibid.*, 97). The passes leading to Tibet seem also to have been frequented by soldiers, for according to Andrade (*ibid.*) the *rājā* of Śrīnagar in

The Nepāl Valley, Natural Link between India and Tibet

The historical knowledge of the Nepalese trails is somewhat more complete.⁴⁷ In this country which extends over 800 kilometres from west to east with formidable mountains, ravines and transverse valleys, as well as innumerable waterways flowing into a maze of narrow gorges, the Kāthmāṇḍū basin, mid-way between the plains of Hindusthān and the Plateau of Tibet, occupies a privileged geographical position. The southern barrier and the redoubtable lowlands of the tarāi have granted passage to the Hindu civilizing influences; while to the north several passes, negotiable from May to September, open through colossal bulwarks the passage from Lha-sa and China.

This route had been identified and explored since the seventh century by Chinese pilgrims and envoys.⁴⁸ The Catholic missionaries who in the seventeenth and eighteenth centuries frequently journeyed this way have transmitted valuable information concerning its various stages.⁴⁹ To travel from Paṭnā to Kāthmāṇḍū, one proceeded along the left bank of the Gaṇḍak as far as the region of Motihārī; whence the most frequented track crossed, as does the present road, the tarāi⁵⁰ to

Gaṛhvāl would have invaded Tibet from three different places with his armies of 12,000 to 20,000 men.

47. S. Lévi (*Népal*, vol. I, 75-228) surveyed the diverse sources (European, Chinese, Tibetan and indigenous documents) which are available for the study of Nepāl and evaluated them respective of nature, implication and significance.

48. *Ibid.*, 150-63.

49. The information provided by missionaries, Jesuit and Capuchin has also been studied by S. Lévi (*ibid.*, 150-63), who recounts the tormented history of the Tibetan and Nepalese missions (1703-68).

50. It is the itinerary summarily recorded by the Jesuits Cabral (1632), Grueber and d'Orville (1661) (Wessels, *op. cit.*, 157, 192-7; Lévi, *op. cit.*, 82-7) and J. Marshall (1668-72) (*Notes*, 161, 166-7). The road book from Candranagar to Lha-sa by way of Nepāl, compiled by Father Georgi in *Alphabetum tibetanum* (1762), reproduced by Lévi (*op. cit.*, 118-29), indicates a more detailed route, traversing Sīnghiyā and Mehsī. Father Marc (1758-68) mentions (*ibid.*, 123-25) another track which set out from Betiyā. Finally, these trails have been described with great care by Kirkpatrick, who travelled them at the time of his journey in 1793 (*An Account of the Kingdom of Nepaul*, 10-87, 329-36).

The English envoy reports of two trails between the forested border and Hetaurā. The first, which he followed from Maniyārī (on the left bank of the Vāgmatī, where it crosses the Nepalese frontier) via Piprā, Bhagavānpur, Bārahgarhī, Jhāra-jhārī and Cīriyāghāt (*ibid.*, 11-26), was irregular, unhealthy and of but secondary importance. Father Georgi (Lévi, *op. cit.*, 119-22) seems to have followed this course, at least in part. The second route which, from Betiyā or from Sagaulī via Garpasārā and Bicchiyākori, traversed regions less exposed to floods and having more sparse forests, channelled almost all commercial traffic (Kirk-

then, beyond Hetaurā, scale the bordering chain to Cisopānī garhī before reaching the centre of the basin.⁵¹ It thus followed a shorter course than does the present road. The trail from Lha-sa, as described by European wayfarers, followed a difficult course: menaced by land-fall, one clung to the rocks above the chasms and had to climb to altitudes of 4,000 to 5,000 metres, crossing the Kutī and Thaṅg-Lā Passes which were blocked during seven months of the year.⁵² There was, however, a less arduous passage traversing the Kiroṅ (Kyi-roṅ, 'dog's gorge') Pass which attains to an altitude of only 3,000 metres and was even accessible to horses.⁵³ The Nepalese ambassador, who made the journey to Peking every five years to pay the requisite tribute, returned by this passage so as to bring the ponies presented by the Chinese emperor. It was also via this way that the Chinese troops penetrated Nepāl in 1792.⁵⁴

In addition to these trails, the missionaries knew of a 'very difficult and perilous route'⁵⁵ much farther to the east, which probably would have traversed the Haṭiyā Pass and followed the course of the Arūn River.

The shortest and most convenient way for the traders of Hindusthān to reach Lhasa was that which went through Sikkim via the broad Cumbī Valley, though it crossed unhealthy jungles infested at all seasons with malaria. This route was taken during periods when the

patrick, *op. cit.*, 27-46; Father Marc, in Lévi, *op. cit.*, 123-4; Landon, *Nepal*, vol. I, 170-8).

51. Between Hetaurā and Kāthmāṇḍū, Father Georgi (in Lévi, *op. cit.*, 122) appears to have ventured along a difficult and seldom travelled route via Makvānpur. The usual trail, after having passed through Dhokaphedī and Bhīmpheḍī, climbed the steep slopes of the Cisopānīgarhī Pass to then descend towards Tāmbokhānī, whence either via Pharpīṅ, the Vāgmatī River, Khoknā and Pāṭaṅ, or by way of Citlaṅg, Candragiri and Thānkot, it reached the capital city (Kirkpatrick, *op. cit.*, 47-77; Father Marc, in Lévi, *op. cit.*, 124-5; Landon, *op. cit.*, 178-81). Today, the carriageway passes to the west of Bhīmpheḍī.

52. Fathers Grueber and d'Orville followed this trail coming from Lha-sa (Wessels, *op. cit.*, 192-7; Lévi, *op. cit.*, 82-7). J. Marshall (*Notes*, 166-7) indicates the same itinerary. Father Georgi, in his compilation (Lévi, *op. cit.*, 82-7) and Kirkpatrick (*op. cit.*, 315-22) have collected the names of the main stages: Kāthmāṇḍū, Sankhu, Devapur, Sīpā, Cautarā, Phaltu, Listī, Khāsā, Chosyāṅg and Kutī (vide Landon, *op. cit.*, vol. II, 33-6). The Nepalese segment of this trail passed somewhat northwardly of the present road.

53. Via Navākoṭ and Rasuāgarhī (the stages have been recorded by Kirkpatrick, *op. cit.*, 302-8). The advantages of this route are noted by Désidéri (1716-21) and by Hari Rām, who visited the region in 1885 (Wessels, *op. cit.*, 233).

54. Lévi, *op. cit.*, 131; Landon, *op. cit.*, vol. II, 29-33. Concerning the Nepalese itineraries of the Peking mission, vide Hodgson, *Miscellaneous Essays*, vol. II, 181-90.

55. According to Father Marc (Lévi, *op. cit.*, 131; Landon, *op. cit.*, 43).

Nepalese trails were closed to passage,⁵⁶ and was again frequented as of 1904 after the engineers of the Lha-sa expedition had constructed a road along the same course as previously followed by the old trail. A good part of the exchange between British India and Tibet was effectuated over this route.⁵⁷ Today, the old Nepāl road re-assumes its former importance. The kingdom, emerging from its secular isolation, has permitted India to link the tarāi with the Kāthmāṇḍū Valley by means of a carriageway (1956), and has allowed the Chinese to re-establish the connection with Lha-sa. The course of the new road differs but little from that of the old trail.⁵⁸

The Eastern Passes

Between the Brahmaputra Valley and the Plateau of Tibet, the passes of the Eastern Himālaya have channelled Mongol migrations and Tibetan expeditions in the direction of the Indian slopes. Unfortunately, an almost complete obscurity veils their history. One knows scarcely anything antecedent to the recent past of Bhūṭān, which by way of the *Dvār* (or, gates), a zone of hills covered with tall grass and forests and furrowed by numerous rivers, formed a link with India.⁵⁹

The most travelled Tibetan route passed through the west of the country. The few European travellers who, at the beginning of the seventeenth and close of the eighteenth centuries, ventured that way all followed the same itinerary. They left the plain via the Baksā-Dvār, proceeded up the valleys of the Raidak (or Vaṅchu) and its affluent, the Parchu, traversed Paro and joined at Phari-joṅ the Cumbī Valley route which led to Gyang-tse.⁶⁰

Other than this track, direct but very rough and inaccessible to pack animals by reason of the harshness of its gorges, there were trails along the other river valleys serving the country towns. According to the *bhūṭānī* merchants consulted by Pemberton in 1838, the least difficult

56. According to Fathers Georgi and Cassien (Lévi, *op. cit.*, 43).

57. 'Through the Chumbi valley as through the neck of a bottle, is poured half of the entire trade between India and Tibet. For the trade of all other routes west and east from Kashmir to Assam, a distance of nearly two thousand miles, totals barely as much as that which passes along this one road' (Bell, *Tibet*, 78). As regards the other old Nepalese trails, vide the itineraries provided by Kirkpatrick (*op. cit.*, 286-302, 308-15, 323-7).

58. Karan and Jenkins, *Himalayan Kingdoms*, 107-8.

59. The *Bhūṭānī* used them in the eighteenth and nineteenth centuries to carry out their raids in Āsām and in Baṅgāl (White, *Sikkim and Bhutan*, 264-84).

60. The Jesuits Cacula and Cabral were the first Europeans to enter Bhūṭān, in 1626 (Wessels, *op. cit.*, 122-56). G. Bogle's mission traversed the country in 1774 (Markham, *Mission of George Bogle*); Turner's in 1783 (S. Turner, *An Account of the Embassy*). Concerning the English embassies sent to Bhūṭān between 1774 and 1907, vide White, *op. cit.*, 237-63.

trail set out from Ciraṅg-Dvār and, traversing the valley of the Machu River, reached Punākhā, whence it continued on to the Gyang-tse route. Somewhat farther eastwards another trail led from the Bijñi-Dvār to Toṅgsā; while yet another proceeded from Debāṅgiri to Tāṣigaṅg, whence it continued up the Manās Valley to arrive at Lhasa.⁶¹

When Bhūṭān, as a result of the Chinese threat, felt obliged to emerge from its isolation, the carriageway which was then constructed to connect the Indian frontier and Paro followed roughly the course of the old western trail. It was completed in 1962.⁶²

Hierarchical Organization of the Himālayan Trails

The utilization of the various passes indenting the Himālayan chains thus was not solely dependent upon the natural advantages which they perhaps had been able to offer land transit, but also upon human factors; an aspect which must be stressed.

The Himālayan principalities, isolated from the plain and self-reliant, have jealously held watch over the accesses to their valleys.⁶³ The sovereigns of Bhūṭān have never permitted foreign travellers to take any other trail than that of the Baksā-Dvār, the most difficult, so as to better monitor their movements.⁶⁴ In Nepāl a reciprocal distrust provoked the closure of the convenient Kiroṅg Pass and almost all travel went over the dangerous Kutī trail.⁶⁵ The commercial significance of the passages has varied, moreover, in contingency with political events. The Nepāl route, for example, having been open for a time to the Chinese during the seventh century, was subsequently closed over a long period as a result of the persistent anarchy which prevailed in the Kāṭhmāṇḍū Valley and in Tibet. Then, towards the middle of the sixteenth century the relations between the two countries were resumed,⁶⁶ and during the Mughal period Nepāl was the great *Himālayan porter*. All testimonies concur regarding this point. Other than those active passes of the Hindūkuś which channelled traffic from Turkeṣṭān, many of the Himālayan passes were but infrequently travelled. The Bhūṭān passage was 'dangerous and uncertain', according

61. Pemberton, *Report on Bootan*, 48-50.

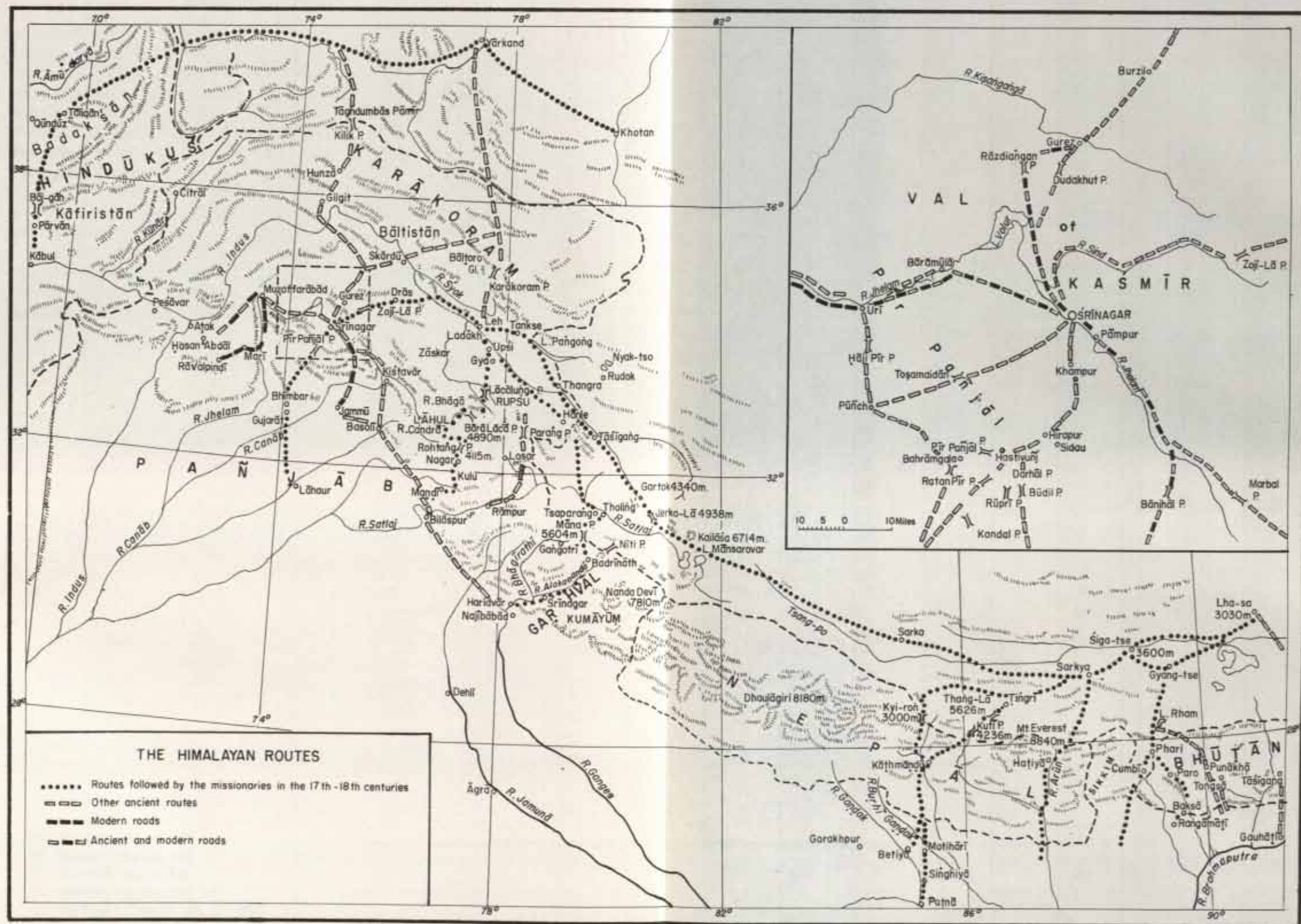
62. Karan and Jenkins, *Himalayan Kingdoms*, 46-9.

63. In ancient Kaśmīr the passes were guarded by forts called *draṅga* or *dvāra* (gates) and the officer responsible for these posts was known by the name *dvārapati* ('the Lord of the Gate'). During the Muslim period this role was entrusted to the 'feudal' chiefs, called *malik* (Stein, *Memoir*, 68-9).

64. Pemberton, *Bootan*, 48-9.

65. Lévi, *op. cit.*, 131.

66. *Ibid.*, 308-9.



1. From the Hindukush to the Burmese chains.

to Cabral;⁶⁷ that from Garhvāl was essentially a pilgrimage route scarcely extending farther than the sources of the Gaṅgā. The trails leading to Ladākḥ, if one is to give credence to Bernier,⁶⁸ were closed subsequent to the intervention of Śāhjahān in 1638; and Marshall, like Bernier, records that *Kaśmīrī* traders took the route from Nepāl by way of Paṭnā,⁶⁹ which Désidéri, who met them at the Kutī Pass, confirms.⁷⁰ The value of the trail from Kāthmāṇḍū did not escape the judicious Tavernier, who has left us a picturesque description.⁷¹ Following the conquest of the country by the *Gorkhā*, at the close of the eighteenth century, trade abandoned these Nepalese routes and other passages between India and Tibet were sought.

In short, the Himālayan trails, blocked by snow during part of the year and often closed for political reasons, have not played a role in the history of Indian communication routes comparable to that of the passages of the Irānian border.

67. Wessels, *op. cit.*, 157.

68. Bernier, *Travels*, 426.

69. Marshall, *Notes*, 169.

70. Wessels, *op. cit.*, 232.

71. Tavernier, *Travels*, vol. II, 204-7.

3. The Gates of the North-West and the Indus Valley

The bare chains of the western mountainous border are riven by several gaps which during the millennia have channelled not only the periodic nomadic wanderings from Upper Asia in the direction of the Indian plain, but also the migrations of different ethnic groups, as well as the armed raids of numerous conquerors. The English expeditions undertaken against Kābul and the notorious disaster to which they were subjected at the Khaibar Pass have tended to obscure the memory of the erstwhile importance of the other defiles of the 'Frontier'.¹

From the Makrān to the 'White Mountains' (Safed Koh)

The arid depressions and oases of Balūcistān between Īrān and the Sindh plain have attracted, at least since protohistoric time, the great currents of land traffic. Archaeological discoveries indicate that interchange was effectuated from an early date by means of the diverging valleys stretching to the east of Kvaṭṭā (Quetta), the badly drained corridors serried between the calcerous folds of the south, and along the coast.²

1. There is here no question of considering the Īrānian and Central Asian routes which have been dealt with elsewhere and are beyond the range of the present study. We shall scarcely go beyond an indeterminate line which, extending from the Hindūkuš to the Makrān, passes through Kābul and Qandahār. The western boundaries of Hindusthān have varied throughout the ages. Since the Hephthalite invasion (at the close of the fifth century), Persia had lost all control over the northern portion of the Afghān massif, but had retained the southern area represented by Balūcistān; for which reason, subsequent to the defeat of the Persian armies, the Arabs were able to take the Sindh with relative ease. Firmly established in the Kābul region, the Grand Mughals returned the *Mauryan* frontier to India. Persia always had political designs regarding Aj-Rukkāj (Qandahār region) and Makrān; India continued to be wary of the area to her north-west. Kābul remained more-or-less nominally in a position subordinate to the Grand Mughals; Qandahār frequently changed hands until 1649, after which all the tentatives of Šāhjahān to re-take the city were doomed to failure (vide Foucher, *La vieille route*, 37, 366).

2. One can indeed suppose that the protohistoric sites discovered throughout the region, which in the past was probably favoured with a more humid climate, were located along the ancient routes. And thus, in relation to archaeological finds, several major axes in the south become apparent, extending along the Nāl Valley and the Mulā Pass; to the north, across the Kvaṭṭā Gap and the Bolān Pass, the Zhob and Lorālāi Valleys (vide Piggott, *Prehistoric India*, 71, 137; Allchin, *Birth of Indian Civilisation*, 102, 128). Srivastava (*Trade*, 28-49) has systematically noted all

The Makrān served as a link between Sumer and the Indus basin.³ Alexander's expedition marched along its coast returning to Persia.⁴ Arabian invaders followed less arduous routes between the eighth and ninth centuries which passed to the north of the Kac Valley and Las Belā before arriving at the towns of the delta.⁵ Over a long period caravans proceeded along the banks of the same incapacious mountain streams infiltrating the rocky terrain scorched by the sun. Holdich⁶ estimates that the intensity of traffic through the gates of the Makrān was then much greater than that of all the passes of the Īrānian border combined. The desert has since buried the prosperous cities which once lived its trails.

The Kirthar Range to the north forms a long, practically insuperable barrier, except at its northernmost extent, where the Mulā gorge leads to the plateau of Kalāt. This is one of Balūcistān's earliest frequented passages,⁷ which probably witnessed the march of the soldiers commanded by Krateros, Alexander's lieutenant,⁸ and which the nomads and their herds have persistently taken at the time of their annual migration to the Sindh plain.⁹ It has since then, not experienced such heavy traffic.

The routes leading to the oases of Kvattā and Pišin are easier to travel through. The Brāhui group of fold mountains come to an end there, as well as the concentric arches of the Sulaimān Range through which one can advance from the plain to the mountains' interior, thus facilitating communications with the Helmand basin. From this opening up to the Gomal River, between calcerous and sandstone undulations, the Zhob and Lorālāi valleys extend to the north-east, from where one could reach the Five-Rivers. Unfortunately, there is no

the references to ancient passages that have been made in the reports of archaeological finds and utilized them to construct (f.p. 32) a map of the protohistoric routes of this zone. It is, however, overly simplified.

3. These contacts are proved by the presence in Mesopotamia of indusial seals that span the Akkadian period around 2000 B.C..

4. Arrian, *Anabasis*, book VI, 21; Q. Curtius Rufus, *De Rebus*, book IX, 10; the sources are discussed by Holdich (*Gates*, 135-68). Vide also M.A. Stein, 'On Alexander's Route into Gedrosia', *Geographical Journal*, vol. CII, 1943, 193-227.

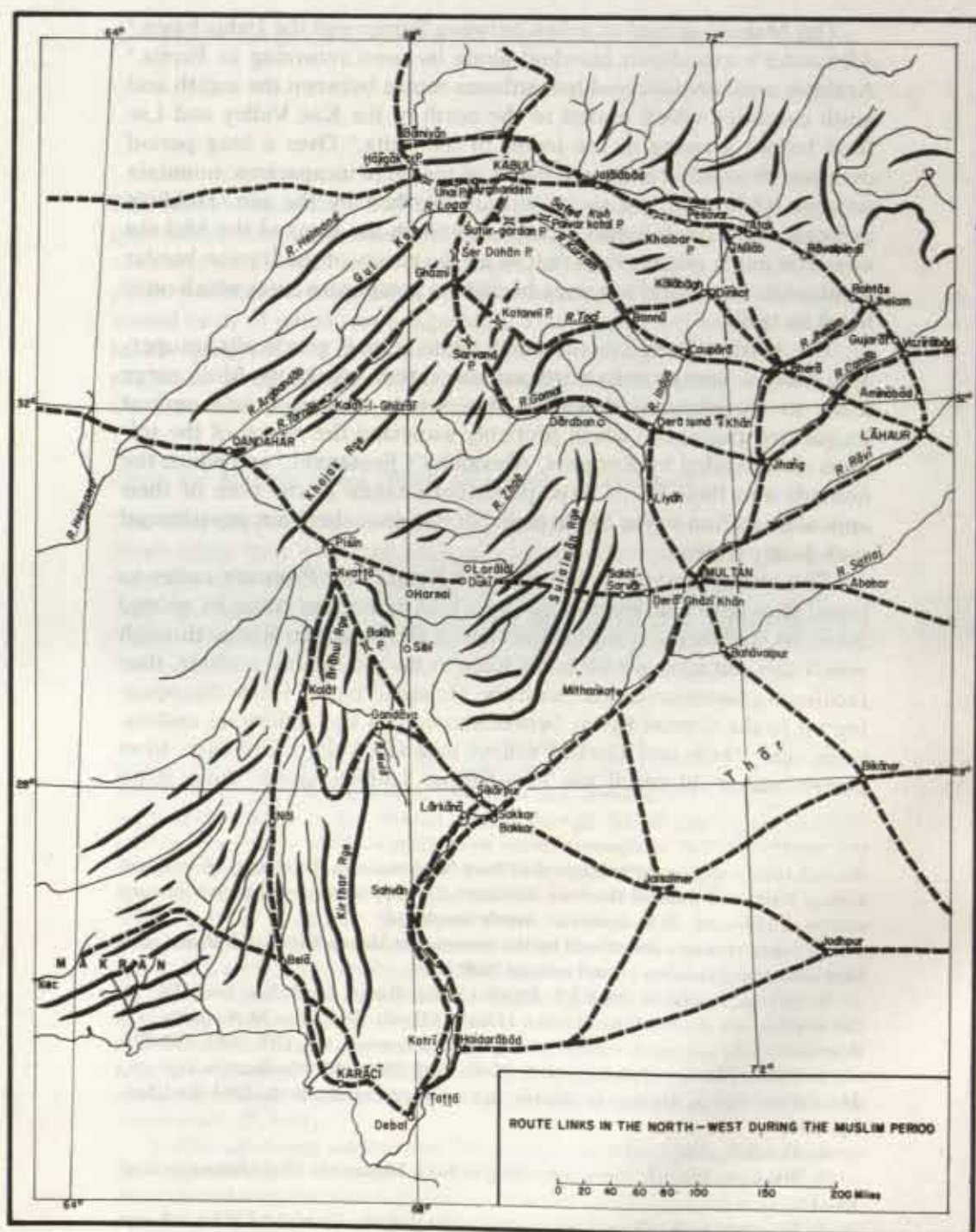
5. Elliot, *History of India*, vol. I, 12-40. Vide Holdich's clarification (*op. cit.*, 284-324) as well as his map of ancient and mediaeval routes in the Makrān (*ibid.*, f.p. 284).

6. Holdich, *ibid.*, 167-8.

7. Since pre-historic times, according to N.G. Majumdar (*Expeditions in Sind*, 153-4).

8. En route to Kalāt and Alexandria in Arachosia (Qandahār) (Holdich, *op. cit.*, 147-8).

9. Masson followed it at the time of his journey to Balūcistān. Vide the stages of this route on Thornton's map, *G.C.A.I.*, 1844, vol. I.



II. The Irānian border and the Indus Valley.

record of the traffic which formerly passed through these low-lying areas. It is most probable that the Arabs would have crossed this region to proceed from Īrān to the Indus, but it is astonishing to ascertain that the great geographers of that period make no mention of this.¹⁰

To the north of the Gomal, the mountainous defiles gradually appear in history with the invasions of Turkish and Afghān tribes; more particularly, from the beginning of the eleventh century subsequent to the foundation in Ghaznī of a strong dynasty and the rapid development of two cities which were to assert themselves as the metropolises of Afghānistān, Kābul and Qandahār (to which we shall later return).

Extending to the Safed Koh, which delimit to the south the basin of the so-called Kābul River, three principal incisions across the bordering chains link the Afghān valleys to the Indian plain.

The most favourable to transit is that of the Gomal River, accessible to Ghaznī by way of the Sarvand Pass, and reaching the Indus in the region of Ḍerā Ismā'il Khān. The Tocī passage, by reason of its abrupt gorges more irregular than the former, is connected to Ghaznī by the Kotannī Pass. Finally, the channel of the Kurram, whose upper course flows along the 'White Mountains', opens an access to the Kābul basin via the Paivar kotal, the Šutur-gardan Pass and the Logar Valley.

The Main Trails during the Muslim Period

Under the Mughals, Qandahār maintained contact with Sindh and the Pañjāb by way of two principal routes which diverged in the region of Pišin, south-east of the Khojak Pass. But little is known concerning the first, which passed through Šāl (Kvaṭṭā), the Bolān Pass, Šikārpur and met with the Indus at Sakkar-Bakkar. Humāyūn, when fugitive, followed this course in 1543;¹¹ and, during the eighteenth century it was by this way that the caravan from Bakkar to Persia proceeded each year.¹²

The second route is somewhat better known, as several European travellers who followed it in 1614 and 1641 have left accounts thereof.¹³ It led to Ḍerā Ghāzī Khān and, from there, on to Multān via Dūkī, Cūtiyālī and Sakhi-Sarvār. A difficult trail traversing to the south the Zhob and Lorālāi valleys, having a relief confounded by escarpments and plateaux, it was nevertheless a significant commercial route be-

10. Holdich, *op. cit.*, 209.

11. *Tazkirat-ul-Vāqī'āt*, transl. Steward, 49-51; *Tabaqāt-i-Akbarī*, in Elliot, *History*, vol. V, 215.

12. Manrique, *Travels*, vol. II, 233.

13. Steel and Crowther (*Purchas*, vol. IV, 270-2) in 1614; Manrique (*Travels*, vol. II, 253-9) in 1641. On his map of the region lying between Dehli and Qandahār, Rennell (*Memoir*, 1792, f.p. 65) has simply reproduced the information acquired from Steel. Vide *J.P.H.S.*, vol. I, 165.

tween Northern India and Persia,¹⁴ as well as having been a strategic passage along an extent of which Bābur journeyed, anno 1505,¹⁵ and which Aurangzeb's army followed in 1552 en route to besiege Qandahār for the second time.¹⁶

The other trails were used as passageways by armed expeditions from Ghazni and Kābul.¹⁷ The famous Maḥmūd and his cavalry would appear to have often passed through the defiles of the Tocī;¹⁸ Caṅgiz-Khān (Gengis Khān) in 1219 advanced through the Gomal Valley with his soldiers; and Tīmūr Lang (Tamerlan) led his forces by way of the Kurram corridor in 1398.¹⁹

Bābur relates in his memoirs that at the beginning of the sixteenth century the principal routes leading into Hindusthān were, firstly the Baṅgaś trail which passed through the Kurram Valley and debouched onto the Indus at Dīnkoṭ,²⁰ and then that from the Farmūl (or Birmal) which, by way of the Gomal or the Tocī, continued on to another ferrying point at Caupārā somewhat farther southward.²¹ These passages were, according to Burnes,²² as yet active at the beginning of the nineteenth century, in particular the Gomal route which, from Derā Ismā'il Khān to Ghazni and Kābul, channelled a significant part of the traffic to Afghānistān. The inhabitants of the region also deemed the trails setting out from Derā Ghazī Khān and from Śikārpur, 'the two doorways to the Khorāsān',²³ to be of great importance.

There were, furthermore, many other passages crossing the arid sierras of this border, activated each year by the slow-moving migration of herds towards the Indus plain in the regulated rhythm of trans-

14. At the beginning of the seventeenth century, approx. 3,000 camels followed this route yearly. However, as of 1614, the maritime route having been blocked at the outbreak of the war between the Portugese and the Grand Mughals, the volume of trade on the Qandahār trail quadrupled and each year 12,000 to 14,000 camels set out from Lāhaur in the direction of Persia (Steel and Crowther, *op. cit.*, 269).

15. *Bābur-nāma*, 206, 238-9.

16. The stages given in *Ādāb-i-'Ālamgiri* roughly correspond to those noted by Crowther (vide Sarkar, *Hist. of Aurangzeb*, vol. I, 83-4). Raverty (*Notes on Afghanistan*, 5-28) has given a detailed description of the passes and routes leading from Multān to Qandahār and has translated a passage from Raṣīd Khān's *Lata'if-ul-Akhhār* depicting the march of Dārā Śikoh in 1652.

17. Vide H. T. Prinsep, 'Note on the Passes into Hindoostan from the West and North-West and the use made of them by different conquerors', *J.A.S.B.*, vol. XI, part I, 1842, 552-73.

18. Elliot, *History*, vol. II, 434-78; Holdich, *op. cit.*, 513.

19. H. T. Prinsep, *op. cit.*, 556, 558.

20. *Bābur-nāma*, 206, 231-2.

21. *Ibid.*, 206, 235-6.

22. Burnes, *Cabool*, 77.

23. *Ibid.*, 79-80, 88.

humance. Mohanlal, in 1836, noted at least eleven distinct itineraries between the mid-valley of the Indus and Qandahār.²⁴ On these scattered tracks which converged amongst the cliffs of the narrow gorges, tribes of shepherds and traders with their camel caravans constituted the major contingent of commerce between India and Khorāsān.²⁵ Unfortunately, the history of these secondary passages eludes us almost completely.²⁶

Thus, from the eastern side all 'Frontier' routes led to the Indus which, until the establishment of the railways, prevailed as the basic means of longitudinal transit and transport. The river was augmented on either side by a track that connected the riparian settlements and was an indispensable complementary passageway. Moving upstream, the caravans which patiently proceeded up the valley could well have vied with the inland water transport, following the river's meandering before bifurcating, according to destination, either towards the mountainous tracks, or the desert trails.²⁷

The Routes of the Afghān Massif

Before considering the series of basins and gorges that succeed one another to the north of the Safed Koh, and to which the ancient annals have allocated a special place, it is necessary to at least adumbrate the history of the prominent trunk roads which came there to an end.

Foucher, in his well-known monography on the "Indian Route of Old",²⁸ after having constated that the former cities had often been re-located and that the passageways had been correspondingly re-oriented,

24. Five between *Derā Ghāzi Khān* and *Mithānkoṭ*, and six others to the south which left the Indus at *Rojhān*, *Badanī*, *Ghauspur* and *Śikārpur* (Mohanlal, *Travels*, 406-11). Vide also in Thornton's *G.C.A.I.* the list of routes recognized as the most practical in the first half of the nineteenth century: Qandahār-Herāt, *Ghazni-Derā Ismā'il Khān*, *Derā Ghāzi Khān-Qandahār*, *Ghazni-Kvaṭṭā*, *Śāl-Kalāt*, *Kalāt-Kotri* (vol. II, 293-338 and vol. I, map, at the end).

25. Vide *infra*, 253-54.

26. Rennell's map (*Memoir*, 1792) contains almost no topographical indication concerning this entire zone. That of Thornton (*op. cit.*, vol. I, at the end) notes only the settlements along the Indus or the main trails. It was the exploratory journeys of the nineteenth century and the investigations of British administrators that have made known *Balūciṣṭān* and the 'North-West Province Frontier'. Vide the list of routes leading from *Kābul* towards the south-east as given by Raverty in *Notes on Afghanistan*, 68-95.

27. Vide the detailed itineraries given by Thornton in *G.C.A.I.* (vol. II, 350-75); *Rohri-Jaisalmer*, *Ṭaṭṭā-Kotri*, *Kotri-Sakkar*, *Kotri-Sahvān*, *Sakkar-Lārkānā*, *Lārkānā-Sahvān*, *Śikārpur-Lārkānā*, *Sahvān-Karāci*. Vide also 'Various Routes in Scinde from official documents from Bombay', of March 1840, *J.A.S.B.*, vol. XII, part I, 1843, 44-59.

28. *La vieille route de l'Inde de Bactres à Taxila*, Paris, 1942.

considers that the most important modifications in the urban centres of Afghānistān had been undertaken at the time of the Muslim invasions. Previous thereto, in the former provinces of Arachosia (region of Qandahār), Bactria (Afghān Turkestan) and of Kapiśa (Kohistān of Kābul), the large cities were Alexandria, Balkh and Kāpiśi; and, it was in their direction that the lines of communication had been oriented. Subsequent to the conquest, other cities developed more or less immediately in their proximity: Mazār-i-Šarīf replaced Balkh, as Qandahār superseded Alexandria and Kābul supplanted Kāpiśi 'even in the memory of historians', while another city was founded, Ghaznī, which was to become for a period of two-and-one-half centuries a splendid capital.²⁹ The consequences of these changes respective of the road network are known.

Initially, to the south, Alexandria in Arachosia was probably located on the right bank of the Arghandāb and it is likely that, until the seventh century, the Kapiśa route had followed the river. Qandahār, succeeding to the old metropolis, moved to the east towards the Tarnāk, and this sub-affluent was then to channel the new route in the direction of Ghaznī and of Kābul.³⁰ During the Mughal period it passed through Šahr-i-Safā, Kalāt-i-Ghīlẓāi and north of Ghaznī divided into two branches, one of which descended the Logar Valley,³¹ while the other debouched to the west of Kābul, at Arghandeh, and corresponded thus to the present road.³² It was, as relates Tavernier,³³ the easiest way in which to proceed from Isfahān to Lāhaur and was preferred by all travellers to the desolate track leading to Ẓerā Ghāzi Khān (vide *supra*, 27-28).

To the north, the main artery from Bactria to India traversing the Hindūkuś, which having abandoned Kāpiśi in favour of Kābul, rather than continuing on to the south-east to the portal of the Ghorband Valley, was subsequently oriented directly southwards, thus to arrive at the new capital, whence it proceeded directly eastwards making its way to Jalālābād. Consequences of this displacement of the metropolis were also felt farther to the north. Departing from Bāmiyān, the route tended to gravitate towards Kābul and to traverse the Hājīgāk and Unai passes: a new itinerary which since the Muslim era was a serious concurrent to the Ghorband passage.³⁴

These urban variations necessarily had repercussions on the eastern section of this artery leading to India.

29. Foucher, *ibid.*, 202, 47, 244.

30. *Ibid.*, 202.

31. *Cahār Gulšan*, CIV-CV.

32. Tavernier, *Travels*, vol. II, 74; Tieffenthaler, in Bernoulli, *Description*, t. I, 69.

33. Tavernier, *op. cit.*, vol. II, 73.

34. Foucher, *op. cit.*, 246.

'The Indian Route of Old' (Foucher)

The valley of Kābul, granting direct access to the Pañjāb, divides into two distinct parts: the one, having very irregular relief, occupies the first terrace of the Afghān massif; the other, comparatively even, is already on Indian terrain, extending from Jalālābād to the Indus. The descent from this tier of elevation followed either the course of the Pansjir which watered Kāpiśī, or the *rūd* upon which the modern Kābul was re-built (Kābul-rūd). Until the eighth century, the political and commercial centre of this region was situated at the confluence of the Ghorband and Pansjir Rivers, and the old route from Kāpiśī to Nagarahāra by way of Lampaka (Laghman) responded more satisfactorily to the actual needs and amenities of those times past than the route from Kābul to Jalālābād. To then continue on to Takṣaśilā or Rāvalpiṇḍī, it was thus inexpedient to traverse the Khaibar Pass leading to Peśāvar. Puruṣapura was only to be founded four centuries subsequent to Alexander, and the destination was Puṣkarāvati, then capital of Gandhāra. The Indus crossing was not made at Aṭak, but somewhat farther upstream at Udabhāṇḍa or Uṇḍ, traditional ferrying point during high-water periods, fording place at times of low-water, and utilised by Hsüan-tsang as well as by Bābur. This was the itinerary of the successors of Alexander, then of the barbarian invaders down to the first century of our era. The mediaeval route progressively abandoned these orientations. There was firstly a deviation to Puruṣapura, founded at the close of the first century, and yet linked by a detour to the old capital, Puṣkarāvati, which yielded but gradually its importance to its young rival, seeing that the ferry passage at Uṇḍ was still in use in the sixteenth century. Later, subsequent to the decline of Kāpiśī to the avail of Kābul, as of the beginning of the eighth century when the Khaibar Pass linked the new capital to Peśāvar, the main road no longer left the southern bank of the river and the direct link with Aṭak ultimately prevailed³⁵ (vide Fig. III).

On the other bank of the Indus the points of reference, in particular along the Indo-Gangetic threshold, are of far less certainty. There is no compulsory passage as in the western mountain ranges; and, furthermore, the available information pertaining to land travel is quite inexplicit. The ancient history of the settlements of this zone remains for the most part unknown.³⁶ Apart from Takṣaśilā, scarcely more than two nodal points are to be discerned which appear to have attracted successively the main road: Śākala and Lāhaur. Śākala (or Syālkoṭ), a

35. *Ibid.*, 28-53.

36. The map of sites of the protohistoric period discovered between the Indus and the Gaṅgā shows that the Indo-Gangetic threshold has served since early times as a link between the two fluvial basins (vide Wheeler, *Early India and Pakistan*, 32), but it does not enable the determination of the courses followed by definite trails.

fortified town at the time of Alexander, Menander's capital (at the beginning of the second century B.C.) and that of the Hephthalite monarch Mihirakuta (in the sixth century A.D.), appears to have had a brilliant history until the seventh century. Lāhaur became an important city as of the beginning of the eleventh century (vide Fig. IV).

According to Buddhist sources, the royal road to the east of Takṣaśilā followed the border of the Sivālak via Śākala, traversing in this zone where plain and mountain meet at a right angle the five rivers, yet fordable during the dry season, and then continued directly southwards to Mathurā.³⁷ According to investigations made by the Seleucid Greeks, there existed a branch road traversing the Jamunā to the north of Indraprastha (Dehlī), which probably passed through Hastināpura.³⁸

At the time of Maḥmūd of Ghaznī, if one is to give credence to Al-Birūnī, a way also led along the mountainous border, from the foothills of the Pīr Pañjāl to Sarsāvah on the right bank of the Jamunā;³⁹ but the main road passed by way of Uṇḍ, Lāhaur, Janer, Bhadaur, Sunām, Kaithal, Pānīpat and, on the other bank of the Jamunā, Merāṭh.⁴⁰ The Grand Mughals were subsequently to give it the present orientation.

The Grand Trunk Road from Kābul to Āgrā under the Mughals

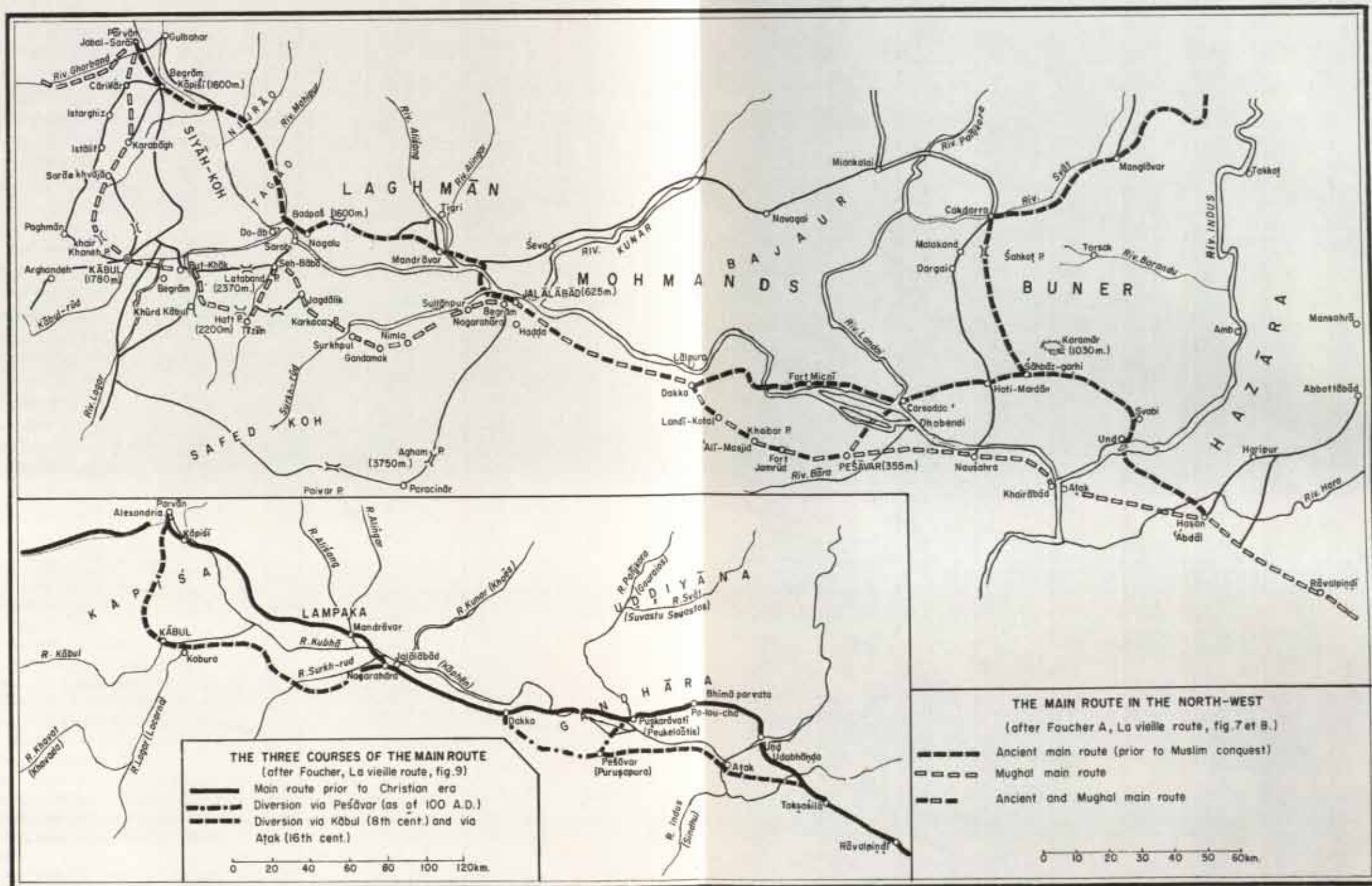
Kābul was thus a strategic and commercial centre in contact with the metropolises of Central and Western Asia. On the other hand, Āgrā and then Dehlī were the brilliant capitals of the empire. The sovereigns of Hindusthān were concerned about the road axis uniting these points of convergence and foresaw it at intervals with fortified posts which have thus determined its course.

37. J. Przyluski ('Un ancien peuple du Penjab: les Udumbara', *Journal Asiatique*, t. 208, janvier-mars 1926, 1-59) has noted the stages of several journeys undertaken during the Buddhist era in the North-West of India, between Takṣaśilā and Mathurā, and ascertained that each time the same route was used, as he always found the same names: Bhadrāmkara, Udumbara, Aggalapura and Rohitaka, which correspond to Syālkoṭ, Paṭhānkoṭ, Agrohā (20 km north-west of Hisār) and Rohtak.

38. Pliny, *Natural History*, book VI, 21.

39. This was the route from Kanauj to Kaśmīr (*Alberuni's India*, vol. I, 205; vol. II, 319; Elliot, *History*, vol. I, 61-2). The stages are difficult to identify: Śīrśāraha (Sarsāvah), Pinjaur (?), Dahmālā (Nūrpur ?), Ballavar (Phillaur ?), Ladda (?), Rājagiri (Rājaurī).

40. This was the route from Kanauj to Ghaznī (*Alberuni's India*, vol. I, 205-6; vol. II, 320; Elliot, *History*, vol. I, 62-3). The stages of this passage, between Pānīpat and Lāhaur, have been studied by Cunningham (*C.S.R.* vol. XIV, 1878-9, 67-8), who identified the difficult names such as Ādittahaur (Bhadaur), Jajjanīr (Janer), Mandahūkūr (Maḥmūdpur or Lāhaur). He considers that the distances provided by Al-Birūnī are generally so exact that the renowned scholar must have obtained his information from someone who knew the country well (vide Fig. IV).



III. From Kābul to Rāwalpindī.

At the time of Bābur, it divided into at least two different branches to arrive at the Indus: the old way of the fords (mentioned above) used mainly during the winter months, and the southern track terminating at Nīlāb (24 km south of Aṭak).⁴¹ Bābur's successors, constructing very considerable fortresses at Aṭak on the Indus and at Rhotās on the Jhelam, obliged the route to cross the rivers at those points (vide Fig. II). The fortress at Rhotās was constructed by Śer Śāh in 1542 so as to control the unruly tribes of the Salt Range; the other, dominating the narrow Atak gorge, was the will of Akbar and has continued, since 1581, to be the key to Kābul.⁴² Thus is explained the new physiognomy of this major route.

The stages are well-known from the accounts of wayfarers of the period who travelled it.⁴³ The route followed approximately the course of the present-day road from Kābul to Lāhaur, except at its western extremity where, as far as Jalālābād, it made a detour southwards to traverse the mountainous border of the Kābul basin.⁴⁴ During periods of insecurity, so as to avoid the exactions of looting tribes in the region, it was always possible to cross the border chain by different trails. Thus, between Dakka and Peśāvar, it was practicable to continue directly eastwards as far as Micnī and then loop towards the south.⁴⁵ On the other side of the Indus the route served Gujarāt, Vazīrābād and Amīnābād, urban developments of the Grand Mughals.⁴⁶

Departing from Lāhaur, the imperial road, punctuated with *kos-mīnār*,⁴⁷ did not pass via Amṛtsar, but somewhat to the south by way of

41. *Bābur-nāma*, 206.

42. Vide Wheeler, *Five Thousand Years of Pakistan*, 74-5, 94-5.

43. The names of the stages, and often a description of the passage, are to be found in Monserrate, *op. cit.*, 116-53 (1581); *Tūzuk*, vol. I, 96-106 (1607); Finch, in *E.T.*, 167-8 (1611); De Laet, *De Imperio*, 55-6 (1631); Tavernier, *Travels*, vol. I, 76-7 (1639-60); Tieffenthaler, *Descriptio*, in Bernoulli, *Description*, t. I, 71-3, 113-4 (mid-18th century); *Cahār Gulšan*, C-CIV; Rennell's map in *Memoir* (1792).

44. The modern road is oriented directly eastwards, following along the southern bank of the Kābul river as far as Jalālābād; the Mughal road passed by way of Butkhāk, Khūrd-Kābul, Tizīn, Jagdālik, Gandamak, Nimla, Sultānpur. To the east of Jalālābād, as today, it connected Dakka, Landī-khāna, 'Alī Masjid, Jamrūd, Peśāvar, Nauśāhra, Aṭak.

45. In 1832, the inhabitants of the country told Burnes that to journey from Peśāvar to Kābul, one had the choice among five different passages; from Peśāvar to Dakka he preferred to take the Micnī route, which was relatively reliable, more so than that from Khaibar (Burnes, *Travels*, vol. I, 113-14; Mohanlal, *Travels*, 58-9).

46. Vide *I.G.*, vol. V, 196; vol. XIII, 535; vol. IV, 353. The principal stages were Aṭak, Hasan 'Abdāl, Rāvalpīndī, Ravāt, Rohtās, Khavāsspūr, Gujarāt, Vazīrābād, Amīnābād and Lāhaur. Concerning the imperial road linking Lāhaur and Kābul, vide the detailed description of the stages provided by Raverty in *Notes on Afghanistan*, 31-48, 95-7.

47. Vide *Annual Progress Report, Northern Circle, for the Year ending 31st*

Nūr-ud-dīn Sarāe, Fatehābād, Sultānpur and Nakodar; cities that today have waned, for since the close of the eighteenth century they have had to bow to the sacred city of the *Sikh*, which has progressively diverted to its advantage the currents of land traffic. Then, from Phillaur via Sarhind, Ambālā, Karnāl, Pānīpat, it reached the capitals, Dehlī and Āgrā, since their inceptions prosperous cities to which the route has thus remained steadfast.⁴⁸

Except for short segments, the route from Kābul to Āgrā has therefore undergone but few modifications since the close of the sixteenth century, a fact testifying to a relatively stable urban settling. Politically and administratively a strategic axis created by the Mughals, it has nevertheless been subject to reverses of fortune corresponding to the decline of the central power. Before the *pax britannica* had restored its previous lustre, it had been abandoned by large-scale trade during more than a century for the sake of secondary routes following the Himālayan border or traversing the arid steppes of northern Rājasthān.

The Secondary Routes between the Indus and the Jamunā (vide Fig. II)

To the south of the imperial highway, the transversal routes coming from the ferrying-points of the Indus were oriented towards the regional metropolises. The trails connecting Nīlāb, Dīnkoṭ and Caupārā to Lāhaur joined at Bherā (on the left bank of the Jhelam), a large market-place at the time of Bābur.⁴⁹ The ways from Dāman (region of *Ḍerā Ghāzī Khān* and *Ḍerā Ismā'il Khān*) converged near Multān, which was the other centre of the alluvial plain.

This old provincial capital, by reason of its location upstream from the Pañjnād (which collects the waters of the five rivers) between Hindusthān, on the one side, and the passes of the Irānian border and the Sindh plain on the other, played from an early date a key role in exchange and interrelation. It was connected to the main road by different lines which doubled the rivers.⁵⁰ The former course of the

March, 1914, 48-50.

48. Concerning the route from Lāhaur to Dehlī, vide Monserrate, *op. cit.*, 95-108; Finch, *op. cit.*, 156-61; De Laet, *op. cit.*, 49-51; Steel, in Purchas, vol. IV, 267-8; Tavernier, *op. cit.*, vol. I, 77-84; Manrique, *Travels*, vol. II, 180-4; *Cahār Gūllān*, XCIII; Tieffenthaler, *op. cit.*, 113 and 146. Concerning the segment from Dehlī to Āgrā, by way of Faridābād, Palval, Hoḍāl, Kōsī, Mathurā, vide Monserrate, *op. cit.*, 92-8; Finch, *op. cit.*, 155-6; De Laet, *op. cit.*, 47-9; Steel, *op. cit.*, 267; Tavernier, *op. cit.*, vol. I, 85-6; Marshall, *Notes*, 159; *Cahār Gūllān*, XCVII-XCVIII; Tieffenthaler, *op. cit.*, 206-7.

49. *Bābur-nāma*, 377-9, 382-7, 479; Rennell, *Memoir* (1792), 87, 115 and map f. p. 65.

50. These roads which regularly followed the waterways characterize the maps of the Pañjāb during the first half of the nineteenth century.

passage from Vazirābād is known, which extended along the Canāb via Jhaṅg;⁵¹ and, in particular, that of the important artery which led to Lāhaur and followed the Rāvi, to the north-east of Talambā, more closely than does the present road.⁵²

Various tracks stretched in the direction of the Jamunā which, in order to circumvent the desert, traversed the Satlaj in the south of the actual district of Montgomery and by way of Abohar and Hāmsī led to Dehli. It would appear that they had been quite frequently travelled prior to the Mughal period⁵³ and, in any case, were used by travellers such as Ibn Baṭṭūṭah and conquerors such as Tamerlan.⁵⁴ They regained their importance as the empire went into decline, subsequent to the invasion of Nādir Šāh, when the main road had become a target of all agitators.⁵⁵ Again at the beginning of the nineteenth century, according to Burnes,⁵⁶ the caravans from the Gangetic Valley proceeded by way of Dehli, Hāmsī, coming to a halt at Bahāvalpur and at Multān, whence they were able to reach Kābul or Qandahār via the 'Frontier' trails.

On the other side of the Mughal artery a series of trails served the markets of the Himālayan fringe. Rennell,⁵⁷ at the close of the eighteenth century, noted several of them: that from Jhelam to Jammū;⁵⁸ that from Lāhaur to Jālandhar via Amṛtsar which continued on towards Sarhind by way of Māchivārā⁵⁹ and into which entered the roads from

51. Vide Rennell (*Memoir* (1792), 110 and map f.p. 65), who utilised Persian documents to determine the course of this route.

52. The stages (Makhdumpur, Talambā, Harappā, Šadr Gugerā) are those of Steel and Crowther (*Purchas*, vol. IV, 269), of *Cahār Gūllan* (CVI-CVII) and of Tieffenthaler (*op. cit.*, t. I, 119). As to the identification of place names, vide *J.P.H.S.*, vol. I, 132.

53. Elliot, *History*, vol. III, 350.

54. Ibn Baṭṭūṭah went from Multān to Dehli by way of Abohar, Ajūdahān, Hāmsī, Masūdābād (vide Yule, 'The Geography of Ibn Batuta's Travels in India', *Indian Antiquary*, 1874, vol. III, 114-7, 209-12). In 1392, Tamerlan's army followed a route from Talambā to Pānīpat via Bhatner and Samānā which intersected the former (Elliot, *History*, vol. III, 416-95). His stages have been identified in part by Sarkar (*Military History of India*, 42-3); vide also Rennell, *Memoir* (1792), 112 and map f.p. 65.

55. Modave (*Voyage*, 324) said in 1777 that the fruit traders of Kābul followed the desert trail to reach Dehli. The routes linking Multān and Dehli are summarily represented on Rennell's map (*Memoir*, f.p. 65), who made use of various manuscript maps (*ibid.*, 70-7).

56. Burnes, *Travels*, vol. II, 414-15. The traders of the upper Pañjāb (from Amṛtsar in particular) journeyed by way of Jhaṅg, Liyāh and met at Dāraban (48 km west of Derā Ismā'īl Khān) whence, via the Gomāl Valley they continued on to Ghaznī and Kābul (Burnes, *Cabool*, 77).

57. He made use above all of information provided by W. Kirkpatrick, Polier, Forster and Tieffenthaler (*Memoir*, 104-11).

58. Rennell, *Memoir*, 106.

59. Tieffenthaler, in Bernoulli, *Description*, t. I, 113.

Syālkoṭ and from Kāṅgrā;⁶⁰ finally, the trail from Ambālā to Sāharanpur leading to the heart of the Doāb. These different segments, roughly corresponding to one of the itineraries provided by Al-Birūnī,⁶¹ appear to have been used to an extent by both Tamerlan and Bābur.⁶² They have survived for the greater part in the present roads or railway lines.

In conclusion, the importance of the trails of the Hīmālayan border must be emphasized. By reason of the general insecurity which prevailed in the plains, they channelled during the second half of the eighteenth century part of the traffic from the Gangetic Plain towards the North-West and Central Asia, from Najibābād to Jammū via Lāl Dhāṅg, Nāhan, Bilāspur and, from there to Kaśmīr and into Afghānistān,⁶³ thereby satisfying the needs of large-scale international trade.

Thus, the longitudinal communications in this region of the North-West seem to have been ensured above all by the waterways. The principal meshes of the road network, oriented in a latitudinal direction, crossed the Indus and its affluents and connected — by loosely-knit links to the south, closer-knit to the north — Persia and Central Asia to the Sindh plain on the one side, and to the Gangetic Valley on the other. Here the Grand Trunk road is encountered, which we shall follow as far as the Bay of Baṅgāl.

60. *Ibid.*, 112; Rennell, *Memoir*, 106-7.

61. The route from Kanauj to Kaśmīr (*Alberuni's India*, vol. I, 205; vol. II, 319; vide *supra*, 32).

62. Elliot, *History*, vol. III, 463-77; *Bābur-nāma*, 454-69.

63. Tieffenthaler (in Bernoulli, *Description*, t. I, 89) has given a brief list of the stages of this route. Forster described it in detail in 1783 and particularly stressed the significance of the commercial traffic effectuated along this passage (*Journey*, vol. I, especially 190, 245-6).

4. The Gaṅgā Valley and the Eastern Margins

a. FROM ĀGRĀ TO PAṬNĀ

The Main Road

After having crossed the Indo-Gangetic threshold, the Grand Trunk Road curved sharply southwards, avoiding the Himālayan fringe to follow with remarkable consistency the courses of the Jamunā and the Gaṅgā as far as the Bay of Baṅgāl.

It would seem, since very remote times, to have been divided into two distinct branches which bifurcated to the north of Indraprastha (or Dehlī), each following one of the large rivers, by way of Mathurā or Kanauj, to then again have joined at Prayāga (or Ilāhābād).¹ The route along the Gaṅgā would appear to have been formerly the most important, particularly after the political centre of the valley had been shifted from Pāṭaliputra to Kanauj. However, once Dehlī had become the capital of Hindusthān, the Jamunā route continued until the nineteenth century to be an object of the sovereigns' attention. The English restored to the former its position of pre-eminence.

During the Mughal period the imperial road, leaving Āgrā, traversed the Jamunā and followed the left bank of the river by way of Śikohābād, Itāvā, Ghāṭampur and Fatehpur to its confluence with the Gaṅgā at Ilāhābād.²

On the other side of the Gaṅgā it followed roughly the course of the present road as far as Banāras.³ From there, in order to reach Paṭnā it was possible to cross the Gaṅgā at the Baksar ferry: this was the way taken by Bābur at the time of his Bihār campaign, and Humāyūn on his

1. According to Buddhist sources, there was a road which followed the course of the Jamunā, via Mathurā and Kauśāmbī, and another following the Gaṅgā by way of Hastināpura, Soreyya and Kānyakubja (Kanauj). Greek sources (Pliny, *Natural History*, book VI, 21) specify that during the *Maurya* period the royal road passed through Hastināpura and Kānyakubja (vide Srivastava, *Trade*, 68-72, 81). At the time of Al-Birūnī (*Alberuni's India*, 205-6), the most important axis, joined at Sarsāvah and at Merāṭh by the two routes from the North-West, also followed the Gaṅgā's course (vide *supra*, 32).

2. Finch (in *E.T.*, 178-9) and De Laet (*De Imperio*, 62-3) only indicate the major stages; Mundy (*Travels*, vol. II, 78-187) and Tavernier (*Travels*, vol. I, 92-6) go more into detail. Vide also Marshall, *Notes*, 160; *Cahār Gulšan*, CX-CXI; Rennell's *Bengal Atlas*.

3. Mundy, *op. cit.*, 107-22; Tavernier, *op. cit.*, 96; Marshall, *op. cit.*, 160; *Cahār Gulšan*, CXI; Tieffenthaler, in Bernoulli, *Description*, t. I, 240; Rennell's *Bengal Atlas*.

return from Gauṛ in 1539.⁴ But the main Mughal road, whose course in this region had been determined by Śer Śāh,⁵ made a detour to the south of Banāras via Mughal Sarāe, Sahasrām and, after having proceeded along the Son, arrived at Patnā.⁶

The only significant diversion since then was made to the interior of the Doāb, resultant of the tremendous development of Kānpur in the nineteenth century which drew the old route to the banks of the Gaṅgā and induced the formation of a loop between Khajuhā and Śikohābād.

Diverse secondary roads between the river and the Himālayan border linked the provincial metropolises to the main route.

The Secondary Roads at the Close of the Eighteenth Century

The courses followed by these secondary passages in the second half of the eighteenth century are known, due to the admirable *Bengal Atlas* by Rennell and the information which has been provided by various travellers.⁷

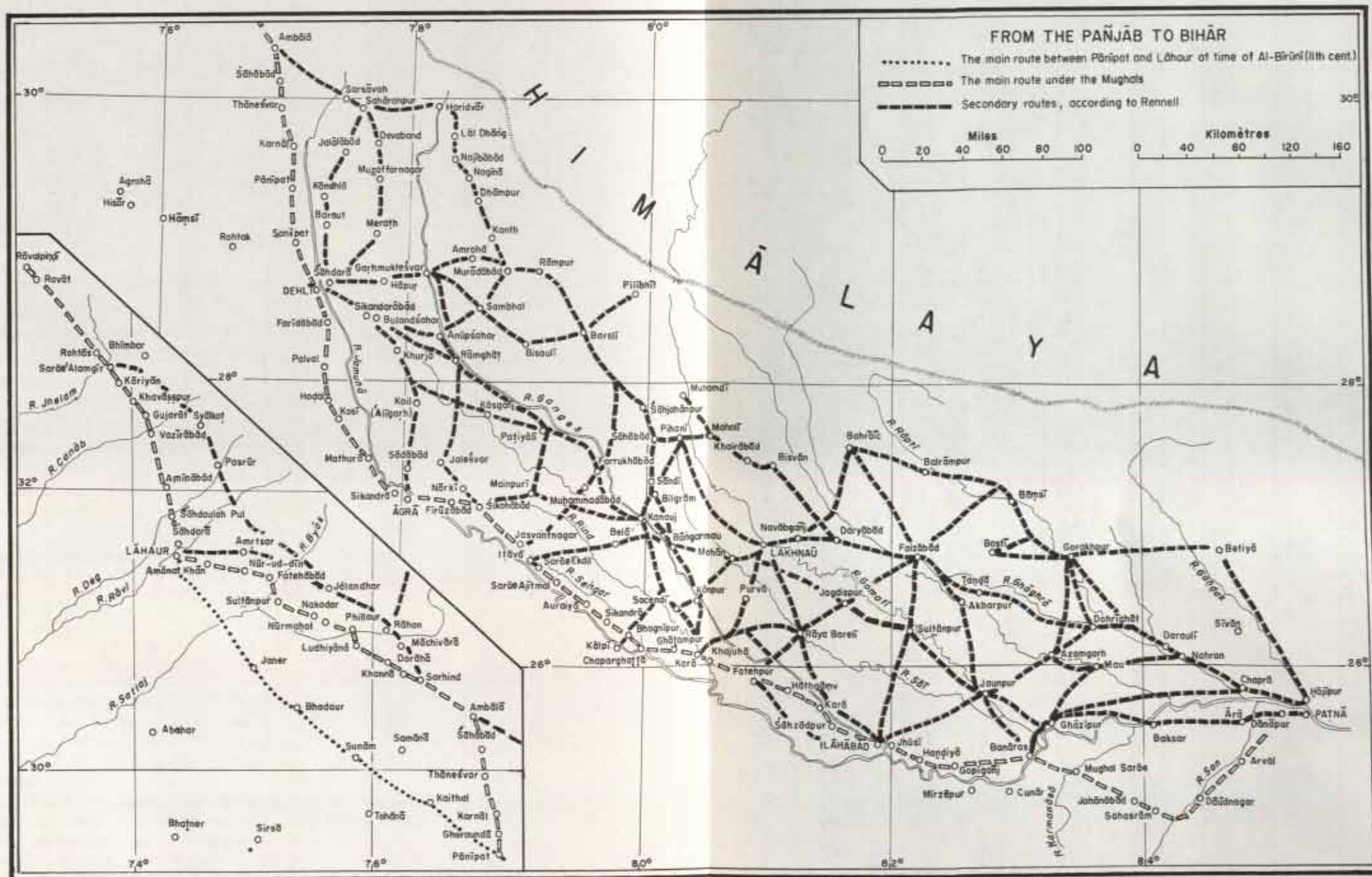
A study of the map by the aforementioned English geographer shows a series of passageways more or less parallel to the Grand Trunk Road, running alongside the large rivers or following the interfluves and linked to each other at regular intervals by transversal roads crossing the riverways.

4. Oldham, 'Routes, Old and New', *Bengal Past and Present*, vol. XXVIII, part 1, 1924, 27.

5. The Sahasrām region was his personal domain, and it was there that he was interred.

6. Mundy, *op. cit.*, 122-57; Tavernier, *op. cit.*, 98-100; Marshall, *op. cit.*, 160; Rennell's *Bengal Atlas*. It is not known at which point on the Son the ferry was located at the time of Śer Śāh. Between Dihri and Barun, where the present Grand Trunk Road crosses? Or, between Hariharganj and Dāūdagar, as indicated in the *Bengal Atlas*? Or, again, between Makrain and Gaṭhauli? Tavernier crossed at Dāūdagar, Mundy at Makrain. As there was no bridge, it is probable that the crossing was made at different points in conformity with the seasons or the state of the riverbed (vide Oldham's remarks, *op. cit.*, 27-8).

7. Vide the map in *Memoir of a Map of Hindoostan (1792)* and Rennell's *Bengal Atlas*. U. Masson (*Means of Transport*, 42-9) has identified several itineraries of Rennell's *Road Book*: Dehlī-Koīl; Dehlī-Almorā via Meraṭh and Murādābād; Dehlī-Korā via Bareli and Kanauj; Farrukhābād-Ambālā via Sahāranpur; Banāras-Sahāranpur. The *Cahār Gulshan* (CIX-CX) provides the stages of the routes from Dehlī to Koīl and from Dehlī to Patnā via Murādābād and Banāras. Tieffenthaler (in Bernoulli, *Description*, t. I) gives the lists of several itineraries: Bareli-Almorā (143, 145); Śāhjānpur-Dehlī (146); Bareli-Sahāranpur (146); Dehlī-Haridvār (2 routes, 147); Kanauj-Itāvā (195); Farrukhābād-Bareli (197); Farrukhābād-Itāvā (197); Farrukhābād-Dehlī (198); Āgrā-Koīl (200); Jaunpur-Ilāhābād (231); Jaunpur-Ghāzipur (231); Ghāzipur-Gorakhpur (231); Ilāhābād-Korā (232-4). Vide also Law de Lauriston, *Mémoire*, 496-510; Hodges, *Travels*, 100-24; Forster, *Journey*, vol. I.



IV. From Rāvalpīṇḍī to Paṭṇā.

The large centres of convergence, Dehlī, Ilāhābād, Banāras, Paṭnā, Lakhnaū, Faizābād, were located on the navigable rivers which were still the essential axes of transit. Of particular importance seem to have been the roads which, from Lakhnaū or from Faizābād, flourishing capitals of the Avadh principality, led to the riparian cities of the Gaṅgā and the Jamunā,⁸ as well as the route from Najībābād which, by way of Farrukhābād, Bareilī, Murādābād, led to the Himālayan border. This was a new route opened by the important traders to transport their merchandise to the regions of the North-West, for the imperial road no longer afforded the necessary security.⁹ At the same time, the *East India Company* considered the shortening of the Grand Trunk Road to the east of Paṭnā.

b. FROM PAṬNĀ TO THE BAY OF BAṄGĀL

The easiest natural means to travel from Paṭnā to Baṅgāl followed the course of the Gaṅgā, because the zones extending on either side of the river were unfavourable to transit.¹⁰ To the south, the plain is bordered by the mountainous belt of the Choṭā Nāgpur, a heavily wooded massif sheltering populations who long resisted the central powers. To the north, the innumerable affluents on the left bank form a labyrinth of riverbeds, alluvial folds and marshland only surmountable with difficulty. Nowhere else in the valley are the jungles of the central hills and the Himālayan tarāi so near. In the region of Rājmaḥal for some 60 km between Pīr Painti and Udhanāḥ the mountains extend almost to the river and the Teliyāgaṛhī defile was considered to be the 'key to Baṅgāl'.¹¹ The main road which thus must necessarily have followed the

8. Srivastava, *Shuja-ud-daulah*, vol. II, 343.

9. Forster (*Journey*, vol. I, 190, 245-6), who notes the stages, emphasizes the important role this road played in large-scale international trade.

10. To study the eastern end of the Grand Trunk Road, there is Oldham's excellent article ('Routes, Old and New, From Lower Bengal "Up the Country"', part I, 'Old Highways and Byways', *Bengal Past and Present*, vol. XXVIII, part I, July-Sept. 1924, 21-36; 'Routes...', part II, 'The New Military Road' and the Grand Trunk Road', *Bengal Past and Present*, vol. XXX, July-Dec. 1925, 18-34); and, equally valuable is Foucher's monography concerning the eastern section of the 'vieille route'.

11. 'To the right of the gorge is a mountain chain, at a half-mile's distance. On the left, at a quarter-mile, is the riverbank. The village is surrounded on the one side by an elevated bank, on the other by heavy forest and nearly impassable environs.... These gorges in Bengal resemble those of the Caspian and Cilicia: for it is by means of them that one may penetrate into Bengal. If one were to raise a wall extending from the mountain's summit to the riverbank, the access would be entirely closed; a very small contingent of soldiers would suffice to bar passage to the largest enemy army' (Tieffenthaler, in Bernoulli, *Description*, t. I, 446). Vide also Hodges (*Travels*, 22-3 and f.p. 22), who gives a sketch of the Sakrīgālī

right bank of the Gaṅgā had, until the nineteenth century, always possessed a considerable strategic value.¹²

The Grand Trunk Road

It is nonetheless probable, that since very ancient times tracks traversed the wooded hills of the Choṭā Nāgpur. Perhaps they were taken by the *Maurya* in order to proceed from Pāṭaliputra to Tāmralipti.¹³ The Chinese traveller, I-tsing, followed them in 673.¹⁴ And, in any case, it appears that there would have been a significant religious traffic in this region. Oldham¹⁵ assumes that at least two ways led to the mouths of the Hugalī River, and from there to Jagannātha-Purī: one setting forth from Banāras or Gayā and passing through the districts of Hazārībāgh and Manbhūm, while the other proceeded southwards from Muṅger by way of the districts of Santhāl Parganā, Bīrbhūm and Bāṅkuṛā. The Muslim sovereigns avoided this 'thicket land' (*Jhār-khaṇḍ*) and scarcely ventured there save to undertake retaliatory expeditions or to circumvent the fortified gorges on the banks of the Gaṅgā.¹⁶ The main artery followed the great river.¹⁷

The courses of these passages varied locally in detail in relation to the divagations of the rivers¹⁸ and in correspondence with the evolution of urban centres, which in this region was particularly turbulent.¹⁹

Pass.

12. It was there that Śer Śāh was stayed as he had set forth to attack the Baṅgāl capital in 1536, and it was also in this area that Humāyūn's army was halted two years later (Oldham, *op. cit.*, part I, 25). Vide also Saran's remarks in *Provincial Government*, 21-2.

13. Pliny, *Nat. Hist.*, book VI, 21. Vide the course suggested by Beglar in *C.S.R.*, vol. VIII, 48-51.

14. J. Takakusu, 'I-tsing', *Records of the Buddhist Region*, XXI; Pandey, *Hist. Geography*, 198-200.

15. Oldham, *op. cit.*, part I, 26.

16. Thus the Muslim sources give to understand: Bakhtiyār Khiljī (1196-1223) probably traversed the Choṭā Nāgpur to go to Baṅgāl; likewise Fīrūz Śāh returning from his Oṛisā campaign. Mān Singh, viceroy of Baṅgāl under Akbar, at the time of his second expedition against the rebels in Oṛisā ordered his troops stationed in Rohtāsgaṛh to take the route from *Jhār-khaṇḍ* in the direction of Medinipur (Midnāpur). Under the reign of Śāhjahān, Śāistah Khān went to subjugate the *rājā* of Palāmū; finally, in 1659, Mīr Jumlah circumvented the fortified city of Muṅger by way of the mountainous zone bordering the city to the south (sources discussed by Pandey, *Hist. Geog.*, 203, and in particular by Oldham, *op. cit.*, part II, 18-9, part I, 25-6).

17. Vide the information we have collected and mapped in our *Recherches*, plates I-VII.

18. We shall discuss this in the second volume.

19. There is no precise information regarding the communication routes of

During the Mughal period, the imperial highway from Paṭnā, administrative centre which regained to an extent the former glory of Pāṭaliputra, to Rājmaḥal, short-lived Baṅgāl capital at the close of the sixteenth century, followed the narrow but convenient passage suggested by nature, via Muṅger on the right bank of the Gaṅgā.²⁰ It divided into two branches at the head of the delta following the two main riverbeds: the Padmā to the east, and the Bhāgīrathī-Hugali to the west.

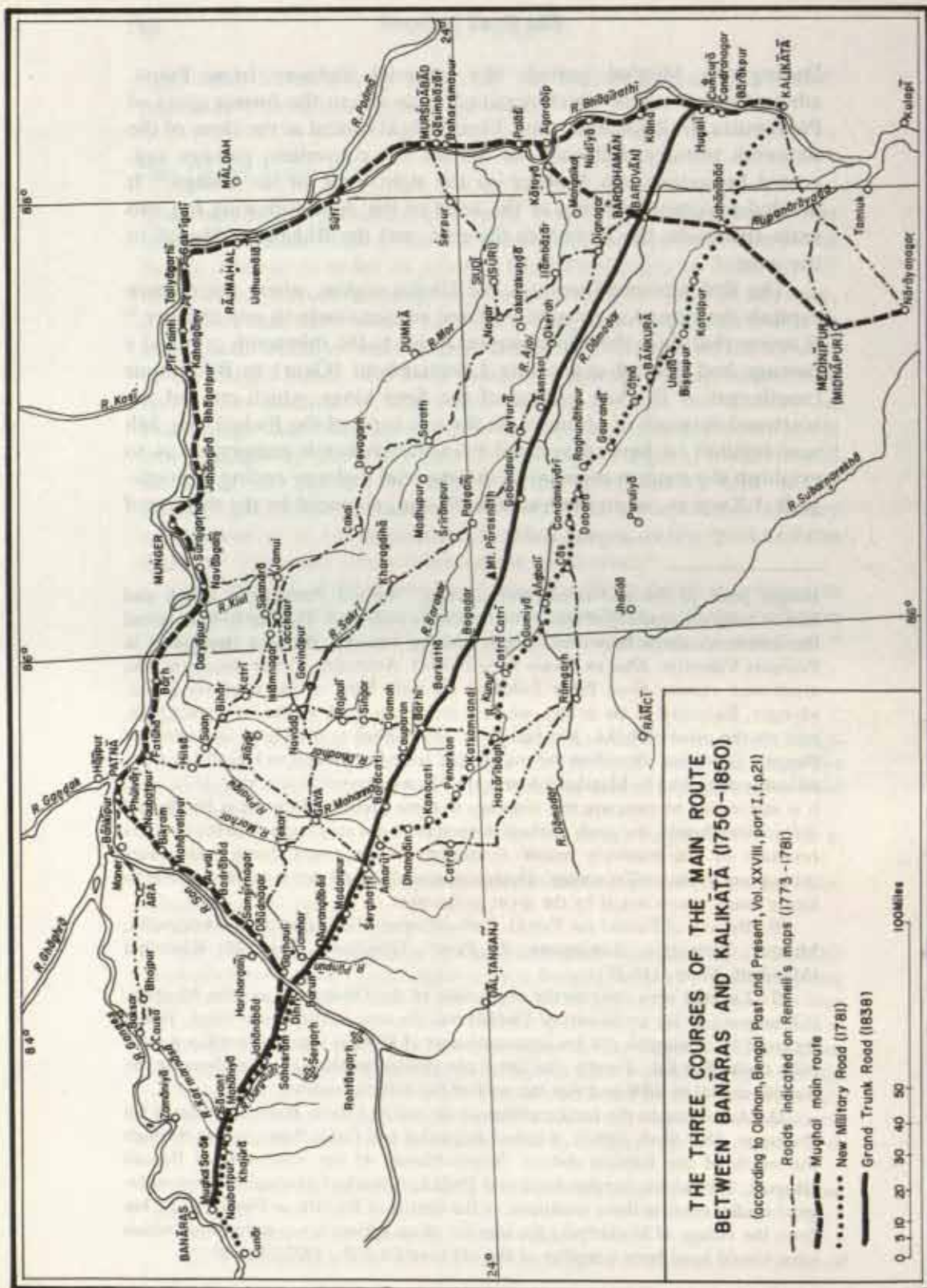
The first advanced towards the Ḍhākā region, where the eastern capitals developed in proximity of and consecutively to one another.²¹ It seems that since the Hindu period (prior to the thirteenth century) a passage had existed connecting Lakṣmaṇāvati (Gaur) to Bikrampur (south-east of Ḍhākā), capital of the Sena kings, which crossed the scattered network of affluents on the left bank of the Padmā. Śer Śāh was reputed to have developed it in the sixteenth century so as to establish the eastern segment of the imperial highway ending in Sonārgām.²² Even so, when the location of Gaur, menaced by the shifting of

Baṅgāl prior to the mid-seventeenth century. The old Portuguese, Dutch and Italian maps are scarcely of use, as no routes are indicated. The first to have noted the itineraries dates from 1660 and is that by Van den Broucke (published in François Valentijn, *Oud en Nieuw Oost-Indien*). According to this document, the main road coming from Bihār followed the right bank of the river via Paṭnā, Muṅger, Rājmaḥal as far as Sūti, where it divided to reach on the one hand Orisā, and on the other, Ḍhākā. Blochmann (*Contributions to the Geog. and Hist. of Bengal*, 13-44) has identified the stages. The road from Paṭnā to Hugali has been minutely described by Marshall (*Notes*, 111-35), who travelled it in May, 1671; and, it is interesting to compare this itinerary to those given by Rennell in his *Bengal Atlas*. Nonetheless, the study of these documents is not easy because of the changes resultant of the relatively recent divagations of the rivers. Some forty years subsequent to Rennell's 'survey', Buchanan already found that it was impossible to locate many places noted by the great geographer.

20. By way of Fatūhā (or Fatvā), Baikunṭhapur, Bārḥ, Daryāpur, Sūrajgarha, Muṅger, Bhāgalpur, Kahlgaṁv, Pīr Painti, Teliyāgarhi, Sakrīgālī, Rājmaḥal (Marshall, *Notes*, 117-35).

21. Located very near to the confluence of the Dhalesbarī and the Meghnā, Bikrampur (19 km south-east of Ḍhākā) was the seat of the Hindu kings. It was replaced by Sonārgām (18 km east-south-east of Ḍhākā) which was still a metropolis under Śer Śāh. Finally, the latter city yielded to Ḍhākā, which became the Baṅgāl capital in 1608 and was the only of the cities to survive.

22. According to the local traditions collected by Hakīm Ḥabībūr Rahmān (in Qanungo, *Sher Shah*, 315-6), it linked Rājmaḥal and Gaur; then, passing through the north of the Rājśāhī district, Serpur-Murcā, 48 km south-east of Bagurā (Bogrā), Śāhzādpur, Serpur-Atiyā and Ḍhākā, it reached Sonārgām. Archaeological studies confirm these traditions: in the district of Rājśāhī, at Dhanorā (2.5 km from the village of Madārīpur) the remains of an ancient levee were found which once would have been a section of the old road (*A.S.R.*, 1922-23, 109).



the rivers, had been abandoned under the Grand Mughals, the route downstream from Rājmaḥal scarcely deviated from the southern bank of the Padmā until reaching the large meander in course which stretched to the east of 'Azimgaṇj, where it formed two arms which again joined shortly before Dhākā.²³ The western branch followed along the left bank of the Bhāgīrathī, traversing it at Agardbīp to continue to Barddhamān (Bardvān), Medinīpur (Midnāpur) and Kaṭak.²⁴ It was the shortest way from Murśīdābād (the Baṅgāl capital in the eighteenth century) to Orīṣā. However, as of the close of the seventeenth century, the main road was subject to the allure of the European trading companies in the lower Hugālī Valley and, once the English *Company* had become a political puissance, it could not resist the attraction exercised by Kalikātā (Calcutta).²⁵

The New Courses of the Main Road

The Grand Trunk Road remained until the mid-eighteenth century oriented according to the fluvial network: the major axis of transit, it was still followed by the troops of the *Company*.²⁶ The decline of Mughal power was to have significant consequences as regards its orientation. From a political point of view, the Indian centre of gravity was no longer Āgrā or Dehlī, but rather Sātārā and Puṇe, and the Maratha cavalymen set out towards Baṅgāl across Goṇḍvānā, Bihār and Orīṣā. The *Company*, menaced on a new front, could not remain unaware of the strategic importance of the furrowed and wooded plateaux of the Choṭā Nāgpur. To facilitate its military operations, which had considerably augmented since 1757, it sought a more direct line of communication to the mid-plain of the Gaṅgā. In 1763, the *Company* dispatched officers to explore the region, and for the first time a British army contingent, commanded by Major Carnac, made its way directly from Barddhamān (Bardvān) to the Sahasrām region,

23. Van den Broucke's map of 1660 shows that the eastern branch of the Grand Trunk separated from the other at Sūtī, followed the southern bank of the Padmā as far as Fatehābād (Farīdpur), then traversed the river to arrive at Dhākā. Tavernier (*op. cit.*, vol. I, 103-4) and Tieffenthaler (*op. cit.*, 458-9) mention a road which crossed the Padmā well upstream from Farīdpur, at 'Acerat' or at 'Totipour' (?). The *Bengal Atlas* provides the following stages: Rājmaḥal, Sūtī, Murśīdābād, 'Azimgaṇj, whence a passage led to Dhākā following the left bank of the river by way of Pābnā, Sujānagar, Jāfargaṇj and Hasanābād. Another served the villages on the right bank as far as Farīdpur and joined the former at Hasanābād.

24. This passage, which Van den Broucke notes as a main road, was taken in 1640 by Manrique (*Travels*, vol. II, 116-9). The *Bengal Atlas* gives the stages.

25. Vide the stages of the route from Hugālī to Qāsimbāzār in Marshall, *Notes*, 111-3, and in the *Bengal Atlas*.

26. Major Adams followed this route during his campaign of 1763, as did Munro in October 1764 (Oldham, *op. cit.*, part I, 28).

traversing the jungles of southern Bihār. On 7 July 1781, Hastings had the *Council* adopt the project of a road running directly from Kalikātā to Cunār via Bāṅkuṛā; the course of which corresponds to none of the routes noted by Rennell.²⁷ It was named the 'New Military Road', and was utilised until about 1830, then abandoned and even totally forgotten by the inhabitants of the region themselves.²⁸ In 1831, under the government of Lord Bentinck, the present course was adopted, more convenient by way of Bardhamān, Āsansol, Sahasrām and Banāras. The work was completed in 1838 and it continued to be the arterial road between Bāṅgāl and Uttar Pradesh.²⁹

We have herewith concluded the history of the last segment of the imperial highway, main artery upon which all of the great sovereigns of Hindusthān had founded their power. The dazzling development of Kalikātā and the opening of the Choṭā Nāgpur to transit are responsible for the recent and very important diversion of the Grand Trunk Road, by which the armies of the *Company* advanced to the doors of Afghānistān to impose the new British rule.

The Passageways of Bāṅgāl and Āsām

In these plains covered (and during the monsoon submerged) by a multitude of tumultuous rivers which have often changed their courses, leaving pseudo-branches and marshes, the provincial passageways have had great difficulty in becoming established, despite the interest of the local sovereigns.³⁰

According to the traditions of the country, which have in certain areas been archaeologically confirmed, there existed prior to the Mughal period, between the Gaṅgā and the eastern mountainous border, several axes which Śer Śāh is reputed to have restored. Firstly, to the east of the Meghnā a passage connected the Ḍhākā region to Caṭṭagrāma; then, on the royal road from Gauṛ to Sonārgāṁ, a road branched off leading via Ghoṛāghāt to the Koc Bihār area. The latter was intersected by a transversal road coming from Darbhaṅgā and Dinājpur which continued on into the Āsām Valley.³¹ They are mentioned, amongst others, in Rennell's works.³²

27. That is to say, 'Patna 2d road' and 'Patna 3d road', whose stages are indicated in *Description of the Roads in Bengal and Bahar*.

28. A detailed history is to be found in Oldham, *op. cit.*, part I, 29-36 and part II, 18-27.

29. This route has also been studied by Oldham (*op. cit.*, part II, 27-34).

30. We shall review the works of these princes in the chapter dealing with road construction (*infra*, 106-12).

31. Vide Gait, *History of Assam*, 44, 51, 60; Qanungo, *Sher Shah and his Times*, 316 and n. 1.

32. *A Description of the Roads in Bengal and Bahar; Memoir of a Map of*

In its time Mursidābād was at the centre of a radiating network, the southern branches of which have already been mentioned. To the north, passageways set forth in the direction of Purṇiyā, Dinājpur, Rampur (Raṅgpur), whence it was possible to proceed onwards to Koc Bihār and to Govālpārā. In Āsām the main roads stretched along either side of the Brahmaputra Valley, with levees serving as dykes having been constructed during the two preceding centuries.³³ Dhākā, the metropolis of the eastern delta, was linked with Caṭṭagrāma via Kumillā to the south-east, with Śrīhaṭṭa (Sylhet) to the north-east, with Rampur (Raṅgpur) in the north-west, and finally with Kalikātā via Farīdpur and Yaśohar (Jessore).³⁴

It is almost certain that the majority of these roads were but miserable trails traversing rivers and marshes,³⁵ passable only after the period of high-waters. This led Buchanan, visiting the district of Dinājpur some thirty years subsequent to Rennell's passage, to say that the roads noted on the maps of the English geographer had existed nowhere else than on paper.³⁶

The Orīsā Route

To proceed from Bihār or from Baṅgāl to Orīsā, one went to the Medinīpur region, from where the Mahānadi delta route set forth. The pilgrimage trails coming from the mid-Gaṅgā ended there, crossing the Choṭā Nāgpur,³⁷ as did the road from Mursidābād and Bardhamān

Hindoostan (1792).

33. Vide *infra*, 110-12.

34. Rennell, *Description of Roads*, 23-4, 37-8, 60-1, 63-70. According to M'Cosh (*Topography of Assam*, 8-9), there was around 1835 another route leading from Dhākā to Govālpārā by way of Jamālpur and Sīṅgrīmarī (Bhuyan, *Anglo-Assamese Relations*, 55-6).

35. At the beginning of the nineteenth century, the most important transit ways were the postal routes connecting Kalikātā with Govālpārā via Mursidābād and Dinājpur, and Kalikātā with Dhākā and Caṭṭagrāma; nevertheless, one could only travel them between the months of November and June (Taylor, *Sketch of the Topography*, 120-1).

36. Martin, *Eastern India*, vol. II, 1018. It must be added that the divagations of the rivers have often resulted in the disappearance of the old levees. The author of the *Gazetteer of Maymansīh* (B.D.G., Mymensingh, 1917, 91-2), after having noted the itineraries mentioned by Rennell in his *Road Book*, constates that the road from Dhākā to Serpur between Mirzāpur and Tāngail no longer existed, that but few traces remained and no one would think that it had once been a trunk road. He adds that to the east of Kiśorgaṇj, where Rennell indicated a passageway proceeding to Śrīhaṭṭa, it would not have been possible in the twentieth century to construct a road due to the maze of pseudo-branches and marshes extending throughout the region around the Meghnā.

37. Vide *supra*, 40.

(Bardvān)³⁸ and the passages from the lower Hugali Valley which, with the development of Kalikātā, witnessed a considerable growth of importance.³⁹

The course of this route, by way of Jaleśvara, Bāleśvara, Bhadrak, Jājpur, Arakhpur, Kaṭak, Pipili and Purī, has varied but little throughout the centuries,⁴⁰ because Kaṭak, occupying an admirable position on the river at the head of the delta, remained the capital since the tenth century and Jagannātha-Purī has always been one of the most frequented of India's places of pilgrimage.⁴¹ The modern diversion between Bhadrakh and Kaṭak, which passes some 15 km west of the old route, allows that the crossing of the innumerable arms formed by the Brāhmaṇī and Mahānadī in their delta be avoided.

Other than this artery, whose military and religious significance was considerable,⁴² there were no other main roads in this isolated province furrowed by rivers. The gaps in the western border, mountainous and wooded, formed narrow doors opening onto a world of primitive tribes hostile to transit.⁴³

This broaches the problem of the relations between the northern plains and the Deccan Plateau. For convenience of exposition, we shall first turn to western India and consider the nodality of the Gulf of Khambhāt.

38. Vide *supra*, 43.

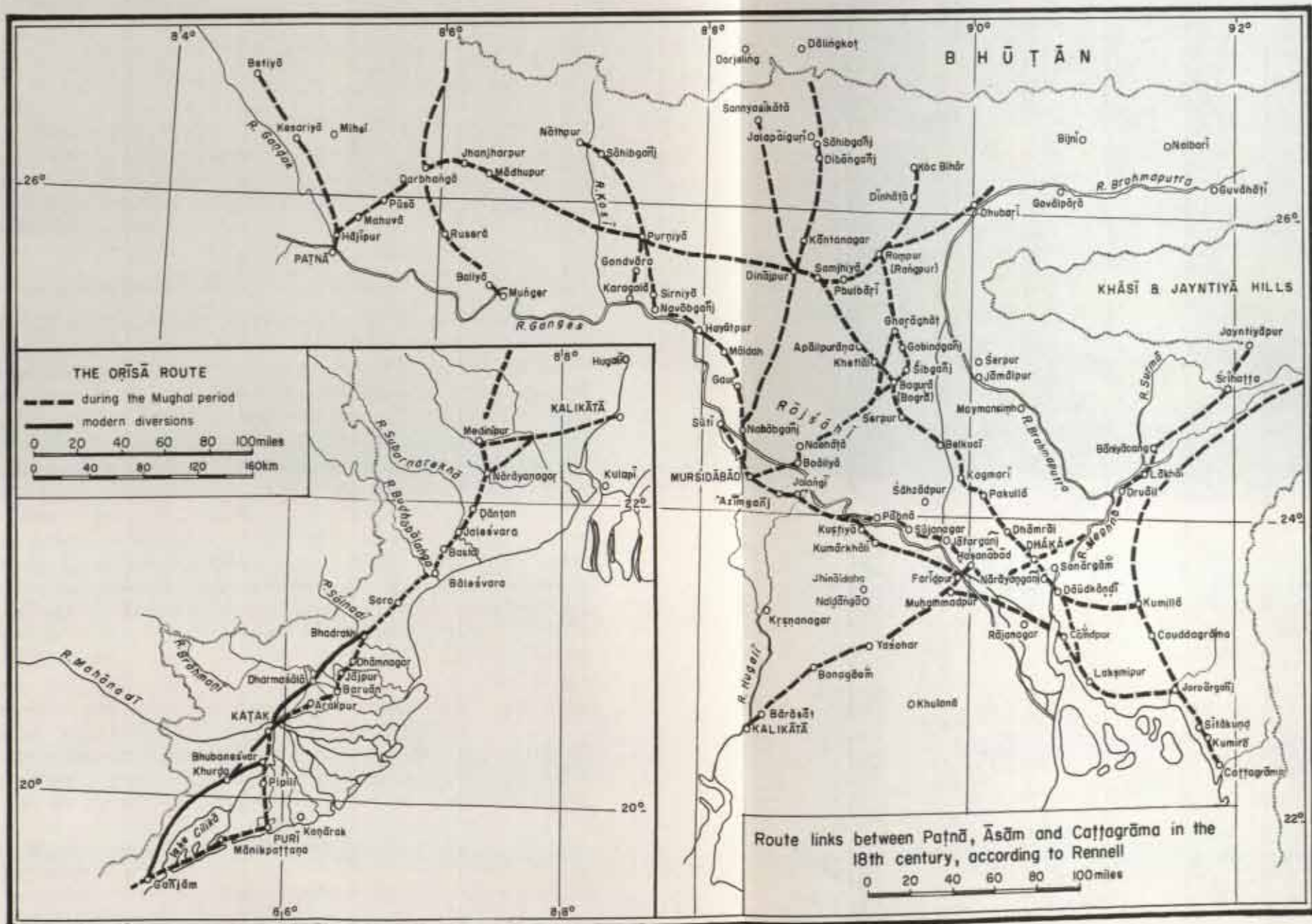
39. There was a branch road from Medinipur to Hugali followed by Marshall (*Notes*, 61-5) in 1669; however, when Kalikātā became the Baṅgāl capital, it channelled to its advantage this latter road and the *Bengal Atlas* shows a double embranchment linking the colonial metropolis to the old route from Orīṣā, either by way of Medinipur, or via Nārāyaṇagar.

40. Regarding earlier communication between Orīṣā and Baṅgāl, vide P. Acharya, 'Ancient Routes in Orissa', *O.H.R.J.*, vol. IV, 1955, 44-9.

41. The names of the stages of the route will be found in the accounts of the following European travellers: Manrique, *Travels*, vol. II, 95-116 (1640); Marshall, *Notes*, 61-5 (1669); A. Hamilton, *New Account*, 1930 edition, vol. I, 209-19 (1708); Duperron, *Zend Avesta*, t. I, I, LXII-LXXXI (1757); Motte, 'Narrative', *O.H.R.J.*, vol. I, 1952, app. II, 1-19 (1766); Leckie, 'Journal', *O.H.R.J.*, vol. II, 1953, app. IV, 1-5 (1790); Rennell, *Description of the Roads*, 29-31.

42. Rājā Mān Singh went this way in 1591-92 at the time of his Orīṣā expedition; under Aurangzeb in 1660-63, the same itinerary was followed to quell the rebellion of the chiefs of this province (vide Ray, *Orissa*, 149). Concerning the travel of pilgrims, vide Hunter, *Orissa*, vol. I, 152-7; vol. II, 81-3, 130-9.

43. We shall view (*infra*, 86-87), in the chapter on Goṇḍvānā, the passageways leading from Orīṣā to the centre of the peninsula.



VI. From Patnā to Āsām and lower Baṅgāl. From Medinipur to Gaṅjām.

5. From the Gulf of Khambhāt to the Northern Plains

Intercommunication between the Gangetic Plain and the Deccan Plateau was effectuated from an early date in the direction of the Narmadā estuary or of the valley of the Upper Godāvarī, resultant of the attraction exercised by the active ports of the Gulf of Khambhāt and the Thāṇe coast.

The Ancient Nodalities of the Gulf of Khambhāt and the Thāṇe Coast

The Gulf of Khambhāt has, since the time of the Indus Civilization, played a considerable role in human interrelation, as witnessed by the Harappā sites which have been discovered in proximity of its coastline.¹ Throughout the first centuries of the Christian era it was a region of great importance, where the large currents of continental traffic from Hindusthān and the Deccan ended, as well as the maritime routes from the Persian Gulf and the Red Sea. Bharukaccha (Bharuc) was then the great trading centre of Western India.² Farther southward the ports on the Thāṇe coast, such as Sūrpāraka (Sopārā) and Kalyāṇa, were also nodal points.³ In the interior of the region, to the north-east, certain locations are of particular significance as a result of their permanence: Mathurā and Kauśāmbī (east of Ilāhābād) on the Jamunā, Māhiṣmatī (Maheśvar) on the Narmadā; and, above all, Ujjayinī (Ujjain). The latter is to be found on the majority of the known itineraries from the Gangetic Valley to the Arabian Sea. Having been a meridian for the Hindu geographers and one of India's seven sacred cities, it was prosperous during the Buddhist era, provincial capital under the *Maurya*, and administrative centre under the Mughals.⁴

Using these great centres of convergence as a basis, one can attempt to establish, at least summarily, the ancient network in Western India.

The old capitals, Pāṭaliputra and Kanauj, were probably linked to

1. Wheeler, *Early India*, 137; Allchin, *Birth of Indian Civilisation*, 179-82.

2. *Periplus*, 41-6.

3. An edict from Aśoka was found at Sopārā and the author of the *Periplus* (52-3) mentions several active ports on this coast.

4. Archaeologists have found at these sites and at other intermediary points a certain number of constants, particularly regarding ceramics, which permit one to assume that these were probably important stages along the route from the Gaṅgā Valley to the Deccan since the first millenium (vide Wheeler, *op. cit.*, 137-45; Allchin, *op. cit.*, 184-90, 208-19).

the Gulf of Khambhāt by passageways traversing Baghelkhaṇḍ and Bundelkhaṇḍ. Buddhist sources speak of a route leading from Kauśāmbī to Pratiṣṭhāna (Paīṭhaṇ) via Vidiśā (Bhilsā), Gonaddha (Dorāhā),⁵ Ujjayinī (Ujjain) and Māhiṣmatī (Maheśvar).⁶ From the *Maurya* to the *Gupta*, Bhārhut and Sāñcī seem to have been road junctions, as was Khajurāho, the capital of the *Candela*, at a later period. Ancient monuments in this region bear witness to an intense artistic activity reflecting a brilliant civilization and implying vigorous human inter-communications. The author of *Periplus*⁷ mentions a large commercial route between Ujjayinī and Bharukaccha which perhaps passed through Dāhod (Dohad) and Vaḍodarā (Baḍodā). It is probable that a road branched off from this axis in the vicinity of Vidiśā leading to Mathurā, and that this sacred city was also in direct contact with the port of the Gulf of Khambhāt by means of a trail from eastern Rājasthān.⁸

It can be assumed that, to the south of the Narmadā, the rupestrian temples of Ajantā, Ellorā, Pāṭaṇe (near Cālīsḡāmv), Cāndavaḍ (Caṇḍor) and Nāśik were since the second and third centuries B.C. located along the passageways mentioned in the texts. Hence, the 'Buddhist' route from Ujjayinī to Pratiṣṭhāna,⁹ after having crossed Māhiṣmatī presumably would have passed by way of the Ajantā ghāt, while the route from Bharukaccha to the old capital of the Upper Godāvarī would have served the regions of Cālīsḡāmv and Ellorā,¹⁰ Nāśik having been then a stage on the route from Māhiṣmatī to Sūrpāraka.¹¹

In the region of the sea the passes of the Western Ghāts channelled from an early date the continental traffic towards the ports of the

5. According to *C.I.S.G. (Bhopal State, vol. III, 104)*, Gonaddha might be identified with Dorāhā, which owes its name to the fact that it was located at the crossing of two roads.

6. *Sutta Nipāta*, 976-7; *Srivastava, Trade*, 71-2.

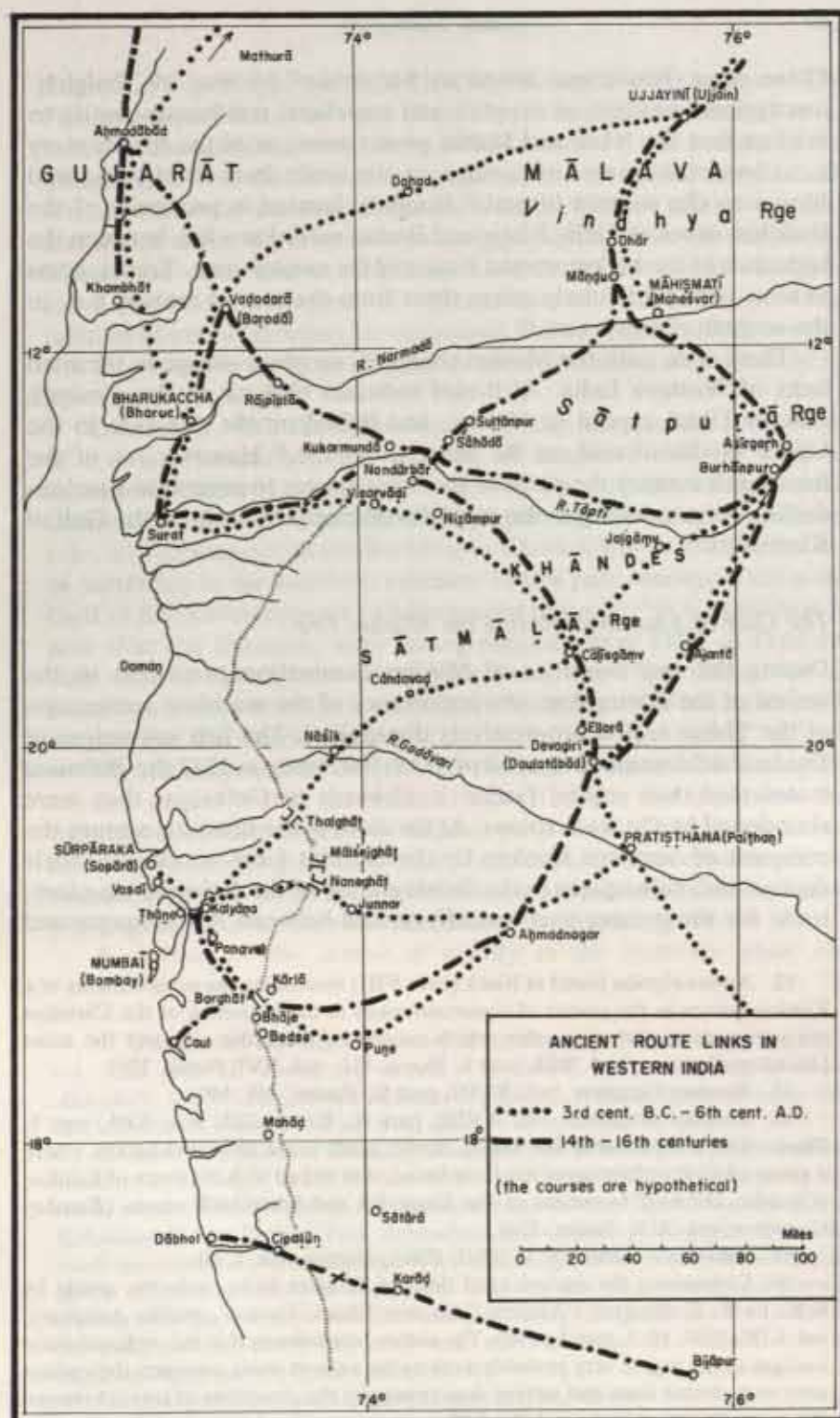
7. *Periplus*, 48.

8. This trail could have passed through Mādyamikā, located near Cittaur, corresponding to the Minnagara of *Periplus* (41) which 'exported a large quantity of its cotton cloth to Barygaza' (Bharukaccha) (vide *Srivastava, op. cit.*, 88).

9. *Sutta Nipāta*, 976-7.

10. According to the *Bombay Gazetteer* (vol. XIII, *Khandesh*, 206) the road from Barygaza to Paethana, mentioned in *Periplus* (51), would have followed the Tāpti Valley as far as Visarvāḍī, then would have reached Paīṭhaṇ by way of the Kundaibārī Pass (near Nizāmpur) and the Kasārbārī Pass in the Sātmājā Range. According to Fleet (*J.R.A.S.*, 1901, 537-52), the stages would have been as follows: Bharukaccha, Markinda, Cāndavaḍ, Daulatābād and Paīṭhaṇ.

11. According to Buddhist sources, Sūrpāraka was linked with the centres in the Gangetic Valley by means of a road which joined at Māhiṣmatī the route from the north (*Dhammapada Attakathā, H.O.S.*, vol. 29, part II, 224-5, cited by *Srivastava, Trade*, 89).



VII. The roads in Western India prior to the Mughals.

Ṭhāṇe area. Nāśik was linked to Sūrpāraka¹² by way of Thalghāt. Inscriptions, vestiges of marches and travellers' rest-houses testify to the fact that the Nāṇe and Mālśej passes were, as of the first century B.C., important places of passage on the route from Pratiṣṭhāna and Junnar to the western littoral.¹³ Borghāt, located in proximity of the Buddhist caves at Kārlā, Bhāje and Beḍse, served as a link between the highlands of the region around Puṇe and the coastal zone. Travel seems to have been particularly active there from the second century B.C. to the seventh century A.D..¹⁴

There was, until the Muslim conquest, no great change in the road links of Western India. Al-Birūnī indicates that yet in the eleventh century Dhār, capital of Mālava, was linked on the one side to the Upper Godāvarī and on the other to Ṭhāṇe.¹⁵ However, as of the fourteenth century the ports on the coast appear to enter into a serious decline corresponding to the rapid development of those on the Gulf of Kambhat.¹⁶

The Gulf of Kambhat during the Muslim Era

During the two centuries of Muslim domination precedent to the arrival of the Portuguese, the importance of the maritime settlements of the Ṭhāṇe region progressively diminished. The first sovereigns of Daulatābād continued to avail of them; but, when in 1347 the *Bahmanī* transferred their capital farther southwards to Gulbarga, they were abandoned by the trade routes. At the close of the fifteenth century the conquest of northern Koṅkaṇ by the Gujarāt kings accelerated their decline and, subsequent to the disintegration of the *Bahmanī* kingdom, trade for the greater part was effectuated between Aḥmadnagar and

12. An inscription found at Nāśik (cave VIII) recounting the achievements of a Koṅkaṇ prince in the matter of communications at the beginning of the Christian era witnesses to the connection which existed between this city and the coast (*Bombay Gazetteer*, vol. XIII, part I, *Thana*, 316; vol. XVI, *Nasik*, 125).

13. *Bombay Gazetteer*, vol. XVIII, part II, *Poona*, 141, 149.

14. *Bombay Gazetteer*, vol. XVIII, part II, *Poona*, 141; vol. XIII, part I, *Thana*, 316. It is probable that Karād, farther south in the district of Sātārā, where a group of 63 Buddhist caves has been found, was linked with the ports of Koṅkaṇ (Cīpaḷūṇ, Dābhol) by means of the Varandhā and Kumbhārli passes (*Bombay Gazetteer*, vol. XIX, *Satara*, 224).

15. Alberuni's *India*, vol. I, 202-3; Elliot, *History*, vol. I, 60.

16. Concerning the ancient road links of Western India, vide the article by K.K. de B. Codrington ('Ancient Sites near Ellora, Deccan', *Indian Antiquary*, vol. LIX, 1930, 10-3, map f.p. 10). The author, considering that the archaeological vestiges of the region very probably were on the ancient roads, connects the various sites with dotted lines and arrives thus to suggest the directions of travel between the second century B.C. and the fifth century A.D. in the west of the Maratha country.

Caul, and between Bijāpur and Dābhol, or was directed to Surat. The Portuguese settlement at Vasaī (Bassein) in the sixteenth century to an extent reanimated the route from Nāsik; however, the decline of the Thāne ports was too advanced. Larger-scale trade in the seventeenth century was oriented towards the ports on the Gulf of Khambhat. The hinterland moreover entered a prolonged period of unrest due to the Maratha rebellion and no mention is made during this period of a trade route traversing the regions of Aḥmadnagar or Sātārā. The development of Mumbaī (Bombay) in the second half of the eighteenth century was to restore to the Thāne region its previous lustre, and attract to its port the major routes.¹⁷

Conversely, with the incipience of Muslim occupation, indications of a new orientation of the currents of transit toward the Gulf of Khambhāt began to appear. The Barvān Pass or that of Sukaldevī, connecting Mālava to Khāndes, came to play an increasingly significant role, and subsequent to the founding by Malik Kāfūr in 1306 of the city of Sulṭānpur at the southern entrance to this pass, the route from the Gulf of Khambhāt appears to have passed that way.¹⁸ It is significant to note that Ibn Baṭṭūṭah, after having marched from Dhār to Daulatābād, went in 1341 by way of Nandūrbār and the Tāpti Valley¹⁹ on his search for a ship, whereas it would have been shorter to have embarked at a port of the Thāne district.

The development of the ports of the Gulf of Khambhāt during the Muslim period is thus an essential fact. Between the thirteenth and fifteenth centuries, Khambhāt became progressively a large emporium and attained to its greatest prosperity in the sixteenth century. In the course of the two following centuries Surat eclipsed all its rivals, before yielding its place to Mumbaī (Bombay), the colonial port.²⁰

A shifting of the centre of gravity in the northern plain also

17. The sources are amply discussed in the *Bombay Gazetteer*, particularly in vol. XIII, part II, *Thana*, 443-4, and XVI, *Nasik*, 125. According to *Indian Antiquary*, vol. II, 101 (*Bombay Gazetteer*, vol. XI, *Kolaba*, 111), the route from the Mahārāṣṭra Plateau to Caul went through Borghāt and Panavel.

18. *Bombay Gazetteer*, vol. XII, *Khandesh*, 106. In the fifteenth and sixteenth centuries at the height of the Muslim dynasty of Aḥmadābād, there was probably a route which followed along the northern bank of the Tāpti, and by way of Kukarmundā, the Buvākā Pass, debouched into Gujarāt at Rājpiplā. Two other roads seem to have played a special role when Asīrgarh was the capital of Khāndes (prior to the foundation of Burhānpur in 1400): the one running north-south, coming from the northern provinces and proceeding to Ajantā and the Godāvari; the other oriented north-east-south-west and leading to the western coast via Jalgaṃv, Nāsik and Thalghāt (*ibid.*, 206-7).

19. *Voyages d'Ibn Batoutah* (Défréméry), t. IV, 42-54.

20. Vide *Bombay Gazetteer*, vol. VI, *Cambay*, 187-221; vol. II, *Surat*, 79-91, 131-4.

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occurred. The Muslim puissance had been crystallized on the banks of the Jamunā at Dehlī; then, for a time, at Āgrā. The urban centres along the central border (from Sāncī to Khajurāho) gradually receded from historical prominence; some even were covered by jungle.²¹ The region became a borderland and the main routes shifted westwards so as to facilitate the exchanges between the capital of the empire and the Gulf of Khambhāt.²²

During the Mughal period, two principal routes led from Surat to Āgrā: one passing through the *rājput* country via Aḥmadābād and Ajmer, the other through Mālava by way of Burhānpur.

From Surat to Āgrā via Burhānpur

The alluvial depression of the Tāptī offered an easy and natural passage between the coastal emporium and the capital of Khāndeś, Burhānpur, which controlled a convenient gap in the Sātpurā. The course of this first section also varied but little during the Mughal period. Following along the southern bank of the river through Nandūrbār, then on the opposite bank through Copḍā, it arrived at Burhānpur.²³

From there, it was necessary to cross the serious obstacle represented by the Vindhya Range and the old route hesitated before several passes that corresponded to different fords across the Narmadā, thus dividing into at least two branches which joined again at Siroṇj. At the beginning of the seventeenth century, the ford at Akbarpur (1.5 km east of Khalghāt) seems to have been the most commonly used and one proceeded by way of the Asīrgarh fortress and the former metropolises of Māṇḍu and Ujjain.²⁴ However, with the reign of Śāhjahān a more

21. Khajurāho was most probably no longer a capital at the time of Ibn Battūṭah's passage (fourteenth century). It seems to have been abandoned by its inhabitants in the fifteenth or sixteenth centuries, which would explain its not having been mentioned in *Ā'in-i-Akbarī* (C.I.S.G., *Eastern India*, VI, A, *Bundelkhand*, 365-6). The great *stūpa* at Sāncī was discovered by chance, in 1877, buried beneath vegetation (*ibid.*, *Gwalior State*, vol. I, 204-5).

22. We shall defer to the following chapter the study of the different branches which extended to the south of the Tāptī towards Koṅkaṇ and the deltas of Āndhra, so as to be able to analyse them at the same time as the other roads of the Deccan.

23. Stages: Surat, Bārdolī, Vyārā, Nārāyaṇpur, Dhātā, Bhādvāḍ, Nandūrbār, Sindkheḍa, Thālner, Copḍā, Adāvaḍ, Sākḷī, Rāver, Burhānpur (Finch, in *E. T.*, 138-46; Mundy, *Travels*, vol. II, 39-50; Tavernier, *Travels*, vol. I, 40-1).

24. Stages: Burhānpur, Asīrgarh, Bhīkaṅgāṃv, Akbarpur, Māṇḍu, Depālpur, Ujjain, Barrai, Siroṇj. This is the route followed by Monserrate (*Mongolicae*, 15-20) setting out from Māṇḍu in 1580, and also that of Finch (*op. cit.*, 138-46) and Jourdain (*Journal*, 146-54) in 1610. Vide De Laet (*De Imperio*, 31-7) and Roe (*Embassy*, 1926 edition, 80-1).

direct means of transit to the east appeared, traversing the Narmadā at Haṇḍiyā and serving Sihor.²⁵

One continued then directly northwards, making a slight bend through Gvāliyar, between Śivpurī and Dholpur, before arriving at Āgrā.²⁶

This was the main military and strategic road from the Deccan, traversing throughout its length the imperial territories directly controlled by agents of the emperor. It channelled all the offensives of the Grand Mughals undertaken towards the south of the peninsula, and was also one of the principal routes of communication from the Doāb to the Gulf of Khambhāt; the other having been the desert route traversing the *rājput* principalities.

From Surat to Āgrā via Aḥmadābād

Two large urban centres contributed to the establishment of the course of this route: Aḥmadābād, capital of the Gujarāt kingdom and one of the most flourishing metropolises of the empire in the seventeenth century; and Ajmer, a very old fortified city in which the Mughal sovereigns resided with preference.

Between Surat and Aḥmadābād the main road crossed the Narmadā at Bharuc, then described a curve inland by way of Vaḍodarā (Baṛodā).²⁷ There were also several roads connecting the various markets of this very active region. It was in fact possible to follow two trails of north-south orientation which traversed the estuary of the Mahī. The first proceeded to Dabkā,²⁸ as far as the tide-mark; the second crossed the river south of Khambhāt, where it forms an enormous bed of lowlands covered by water at high-tide and which could

25. In 1630 Mundy took this route which Tavernier then followed in 1645. R. Temple, studying Mundy's route (*op. cit.*, XXIII) supposes that this new itinerary would have been chosen because of strategic reasons: to facilitate the march of the imperial troops to the Deccan. Stages: Asirgarh, Borgāmv, Nāndgāmv, Carvā, Haṇḍiyā, Icchāvar, Sihor, Dorāhā, Dillod, Barraī, Siroṇj (Mundy, *ibid.*, 51-6; Tavernier, *op. cit.*, vol. I, 42-6; *Cahār Gulšan*, CIV-CV).

26. Stages: Siroṇj, Kacnār, Śāhdarā, Kolāras, Sipri, Doṅgrī, Narvar, Antri, Gvāliyar, Nūrābād, Dholpur, Jājau, Āgrā (Monserrate, *op. cit.*, 20-32; Finch, *op. cit.*, 143-6; Jourdain, *op. cit.*, 151-4; De Laet, *op. cit.*, 34-7; Mundy, *op. cit.*, vol. II, 56-65; Tavernier, *op. cit.*, vol. I, 47-53; section Siroṇj-Narvar: Tieffenthaler, *op. cit.*, 349; *Cahār Gulšan*, CXVI-CXVIII).

27. This was the easiest route, followed by the great travellers Mundy and Tavernier. Stages: Surat, Variāv, Aṅkleśvar, Bharuc, Vaḍodarā (Baṛodā), Vāsād, Naḍiyād, Maḥmūdābād, Aḥmadābād (Finch, *op. cit.*, 173; Jourdain, *op. cit.*, 175; Della Valle, *op. cit.*, 119-20; Fryer, *op. cit.*, vol. III, 158-9; Mundy, *op. cit.*, 266-72; Tavernier, *op. cit.*, 54-9; Thévenot, *op. cit.*, 8-11).

28. It has been described by Thévenot (*op. cit.*, 9-11). Leaving Bharuc, it traversed Sarbhon, Dabkā, Peṭlād, Sojitrā and Aḥmadābād.

therefore only be taken on certain days and at certain times.²⁹ These passageways were interconnected by diverse secondary ramifications.³⁰

From Aḥmadābād to Ajmer the caravans entered the arid section of Rājasthān, to the east of the old chains of the Arāvalī Range, and traversed this interminable peneplain, but sparsely covered with vegetation and sometimes buried beneath the sands. The trail most commonly followed proceeded directly northwards through Siddhapur, Pālaṇpur, Bhīmāl, as far as Jālor,³¹ then made a detour via Pīpar and Mērtā to arrive at Ajmer.³²

Several branches were deployed on this axis which served various market towns and joined the main route at important centres. Thus, one trail led from Aḥmadābād to Jālor via Rādhanpur;³³ another linked Siddhapur to Jālor, passing east of Mount Ābū and Sirohī;³⁴ finally, between Jālor and Mērtā, the ways led on the one hand to the princely city of Jodhpur,³⁵ and on the other, to the large market at Pālī.³⁶

Travellers and European traders of the seventeenth century followed between Ajmer and Āgrā a road which passed through the large centres of indigo collection, Bayānā and Hīṇḍaun.³⁷ One might well be led to believe that it was the Mughal main road, for travellers' accounts

29. Stages: Bharuc, Jambusar, Sārod, Khambhāt, Nagrā, Sojitrā, Mātar, Bārejā (Thévenot, *op. cit.*, 9-11, 17-20; Finch, *op. cit.*, 173-4; Jourdain, *op. cit.*, 171-5; Della Valle, *op. cit.*, 62-94, 102-18). The crossing of the Mahī at low-tide has been vividly described by Della Valle (*ibid.*, 65-6).

30. The route taken by Mandelslo (in Olearius, *Relation*, t. II, 127-33) roughly follows Mundy's, but it makes a detour on either side of the Mahī, to Jambusar and Sojitrā. Tieffenthaler (*op. cit.*, 379) mentions two routes from Khambhāt to Aḥmadābād, the one passing through Dholkā, the other through Peṭlād and Khedā (Kairā); he also mentions the stages of the route from Vaḍodarā to Khambhāt via Borsad and Peṭlād (*ibid.*, 383-4).

31. Stages: Aḥmadābād, Mehsānā, Siddhapur, Pālaṇpur, Dāntivaḍā, Bhīmāl (Tavernier, *op. cit.*, 59-71; Tieffenthaler, *op. cit.*, 333; Mundy, *op. cit.*, 261-6).

32. Stages: Jālor, Bharvānī, Dunārā, Kāṅkānī, Pīpar, Mērtā, Ajmer (Mundy, *op. cit.*, 243-9; Tavernier, *op. cit.*, 71).

33. The longer route by way of Kaḍī, Samī, Rādhanpur and Bhīmāl (Jourdain, *op. cit.*, 170-1; Ufflet, in Finch, *op. cit.*, 173; Tieffenthaler, *op. cit.*, 332-3, 385-7). Jourdain and Ufflet probably followed it so as to obviate tendering the right-of-passage demanded by the local sovereigns on the other trails.

34. Stages: Siddhapur, Magarvaḍā, Rohā, Sarotrā, Muṅghālā, Ābūgarh, Sirohī, Sivānā, Bāgrā, Jālor (Mundy, *op. cit.*, 249-61).

35. Route followed by Jourdain (*op. cit.*, 168-70) between Mērtā and Dunārā; also mentioned by Tieffenthaler (*op. cit.*, 335-7).

36. In 1574, Akbar went from Ajmer to Jālor via Mērtā, Jaitaraṇ, Sojat, Pālī and Bhagavānpur (Elliot, *History*, vol. V, 363 and n. 4).

37. Stages: Ajmer, Kiṣangarh, Mozābād, Cātsū, Lālsot, Hīṇḍaun, Bayānā, Khāmva, Fatehpur Sikrī, Āgrā (Finch, *op. cit.*, 170; Jourdain, *op. cit.*, 168-9; De Laet, *op. cit.*, 65; Mundy, *op. cit.*, 225-43; Tavernier, *op. cit.*, 72; Thévenot, *op. cit.*, 68).

mention having come across milliary columns erected by Akbar.³⁸ However, archaeological studies in fact indicate that it was a simple branch road doubling the imperial highway between Kīṣangarh and Khāmṡā. The survey of *kos-mīnār*³⁹ indicates that the former Mughal road followed a tortuous course, along which were humble villages (only indicated on large-scale maps), and that after Kīṣangarh it continued on to Amber or Jaypur,⁴⁰ to then reach Āgrā by way of Bāṃskoh, Toda Bhīm, Khāmṡā and Fatehpur Sīkrī.⁴¹

The roads on this axis led directly to Dehlī. Setting out from Ajmer, a road proceeded straight to the north-west, via Revārī,⁴² and another trail left Jaypur and caught up with the former shortly before arriving at the capital.⁴³

Thus, we are well-informed regarding the two main routes linking the large port of Surat with the capital, Āgrā, the stages of which have been minutely described by European travellers. These two elongated curves form the framework for the western section of the maps by d'Anville and Rennell. But the remainder of the country was nearly *terra incognita* for the European travellers and, in consequence, for the geographers. Concerning the vast expanse extending from the Indus to the Jamunā and the ridges of Central India, knowledge was but scant, even at the close of the eighteenth century.⁴⁴ Nevertheless, an entire series of secondary passageways allowed of interrelation on either side of the major trunk roads.

The Desert Trails

To the east, across the Thār desert, a very arid steppe covered with thorny shrubs, the camel caravans connected the markets of Hindusthān with the Indus Valley. The English *Company* knew of at least two

38. Withington, in *E.T.*, 225; Finch, *op. cit.*, 148-9; Mundy, *op. cit.*, 226; Thévenot, *op. cit.*, 69.

39. Vide *Annual Progress Report, Northern Circle, for the Year ending 31st March, 1914*, 45-7.

40. Jaypur was founded in 1728.

41. This is the itinerary followed by Akbar in 1574 (Elliot, *History*, vol. V, 362-3). These two routes are indicated by Rennell on the map in his *Memoir* (1792).

42. Stages provided in *Cahār Gulān* (CVII); Ajmer, Harmārā, Mamānā, Sāmbhar, Jubner, Koṭ Pūtli, Revārī, Paṭaudī, Dehlī.

43. Tieffenthaler (*op. cit.*, 211) mentions the following stages: Jaypur, Alvar, Śāhjāhānpur, Nārnaul, Farrukhnagar, Bādsāhpur, Dehlī. Rennell indicates in his map of Hindusthān a more direct route by way of Koṭ Pūtli.

44. Rennell has scarcely augmented the meagre information given by d'Anville. Vide his map covered with blank spaces and fanciful points. It was only at the beginning of the nineteenth century that one began to become better acquainted with this region of India, thanks to the insatiable curiosity of Tod who, in 1815, offered a correct view of Rājasthān's geography (*Annals*, 1873 edition, 1-2).

such trails in the seventeenth century.⁴⁵ One led from Aḥmadābād to Ṭaṭṭā by way of Rādhānpur and the immense marshy plain of the Great Rann of Kacch.⁴⁶ The other led from Ajmer to Jaisalmer, whence it was possible to reach Ṭaṭṭā or Bakkar.⁴⁷

These would have been ramifications of a vaster network, and it is probable that the itineraries noted by Tod at the beginning of the nineteenth century had been utilized for a very long time by shepherds and merchants. There were thus two large junctures of the caravan routes: Jaisalmer which was linked to various ferrying points on the Indus, such as Ḥaidarābād, Sahvān, Rohrī, Mithaṅkoṭ; and then Bikāner, from whence radiated the trails to Jaisalmer, Multān, Hisār, Hāmsī and Dehlī.⁴⁸ At the time of Burnes,⁴⁹ wares and goods of Gujarāt destined for Kābul passed through Pālī, the great entrepot in Rāja-sthān, then continued on to Bikāner and Bahāvalpur whence they were transported on to the passes of Afghānistān (vide *supra*, 35).

These age-old trails, animated by seasonal transhumance towards the Indus in the hot period, and at the outset of the rainy season in the direction of the Thār, were thus also important commercial routes. This was particularly so as of the beginning of the eighteenth century when, as due to lack of security large-scale trade could no longer travel the Grand Trunk Road, the trails were used as alternative routes.

Kacch and Kāṭhiyāvāḍ

A special place must be allotted to the island-like Kacch, isolated as it is

45. From the outset of the seventeenth century the English *Company* attempted to discover more direct routes from Ṭaṭṭā to Aḥmadābād and to Āgrā, but they were forced to renounce this project because of the prevailing insecurity in the desert and the exorbitant rights-of-passage demanded by the local *rājās* (*E.F.*, 1637-41, 137-8, 275).

46. Withington, *op. cit.*, 208-17; De Laet, *op. cit.*, 67-8. It was in December of 1613 that Withington, charged to convey a message to the English at Lārī Bandar, joined up with a merchant caravan setting out from Aḥmadābād for Ṭaṭṭā. Underway the travellers were pillaged, and it was only to the fact that he was a foreigner that he owed his life. Subsequently, it seems that the Europeans dared not follow that itinerary.

47. In 1639 the English *Company* dispatched Bornford to explore the region to determine if it would not be possible to have the caravans journey by way of Jaisalmer (*E.F.*, 1637-41, 137-8, 275). According to De Laet (*op. cit.*, 68), there was also a trail from Āgrā to Bakkar, but it was dangerous. The unfortunate experiences of the English most probably put a damper on the curiosity of the other Europeans, for the desert trails are not again mentioned until the time of Tod.

48. Tod, *Annals*, 1873 edition, vol. II, 302-17. Concerning the network of desert trails at the beginning of the nineteenth century, vide Thornton's detailed map (*G.C.A.I.*, vol. I).

49. Burnes, *Travels*, vol. II, 414.

by vast salty expanses, and the Kāthiyāvāḍ Peninsula, entirely oriented towards the sea and distant from the great currents of continental transit, but nevertheless fully integrated into Indian life, at least since the Buddhist period.⁵⁰

For a long time communications were mainly effectuated along the coast, from one port to another.⁵¹ At the beginning of the seventeenth century an Anhilvāḍa prince had a military road built which led into the interior of the Vāḍhvāṇ and Junāgaḍh territories.⁵² Subsequent to the conquest of the country by the Gujarāt kings, connections were established among the regional centres and the capital. Under the Mughals there were several roads that diverged from Aḥmadābād. A route went to the Jain temple at Pālītānā⁵³ from which branched passageways leading to the active ports at Ghoghā and Dholerā. Two other roads led to Junāgaḍh via Dholkā and Līmḍī⁵⁴ and to Rājkoṭ via Vāḍhvāṇ.⁵⁵ Finally, a road extended to the west which divided into two branches in the region of Morvī to serve the port at Dvārakā and the Kacch metropolis, Bhūj,⁵⁶ which was also accessible by means of a trail from Rādhapur.⁵⁷

From the Arāvalī Range to Bundelkhaṇḍ

Between the Arāvalī Range and the massifs of Bundelkhaṇḍ, the bare reliefs of Mālava with their outliers crowned by fortresses presented scarcely any obstacles to land transit, while the river basins of the Jamunā affluents formed there corridors favourable to communication and interchange. Unfortunately, beyond the military route from the Deccan, but very little is known concerning the course of the passageways in this region.⁵⁸

50. An Aśokan inscription has been found near Junāgaḍh as well as numerous Buddhist rock temples.

51. Vide the map of ancient trade routes of the Kāthiyāvāḍ Peninsula given by Sankalia in *Archaeology of Gujarat*, 267, pl. VII.

52. A tradition reported in the *Bombay Gazetteer*, vol. VIII, *Kathiawar*, 219.

53. Via Dholkā, Koth, Dhandūkā, Vālā (*ibid.*, 219).

54. Tieffenthaler, *op. cit.*, 398.

55. Stages: Sarkhej, Sāṇand, Śāhpur, Talsānā, Vāḍhvāṇ, Muḷī, Thān, Rājkoṭ (*Bombay Gazetteer, ibid.*, 219).

56. Stages: Sarkhej, Sāṇand, Viramgām, Pātrī, Dhrāṅgadhrā, Haḷvad, Morvī; from there a route led to Bhūj, and another to Dvārakā via Navānagar and Kambhālīyā (Tieffenthaler, *op. cit.*, 396-7).

57. *Ibid.*, 386.

58. Only few European travellers strayed from the main road. Regarding the seventeenth century, we depend primarily on the information given by the emperor Jahāṅgīr concerning the passageways he followed between Aḥmadābād and Āgrā, and the scanty topographical notes of Monserrate and of Roe. However, pertaining to the close of the eighteenth century several more-detailed itineraries are

The old road opened by Malik Kāfūr in the fourteenth century to the west of Mālava, which debouched onto the Tāptī near Sultānpur, seems to have been well-nigh abandoned under the Mughals.⁵⁹

It was, on the other hand, possible to utilize other passageways, concerning whose courses there is but little knowledge, which set out from Ujjain to the provinces of Gujarāt, Ajmer and Āgrā. The first, leading to Aḥmadābād and the ports on the Gulf of Khambhāt via Dāhod (Dohad), reached the imperial highway by means of two branches, one of which terminated at Maḥmūdābād or at Naḍiyād, the other at Vaḍodarā (Barodā).⁶⁰ The second set out to Ajmer through Mandasaur and Cittaurgarh,⁶¹ following roughly the present-day railway line. Finally, there was a road which led directly to Āgrā by way of the Cambal basin.⁶²

To the east, from the ridges of Central India to the Jamunā, a series of trails departed from the main road of the Deccan in the direction of

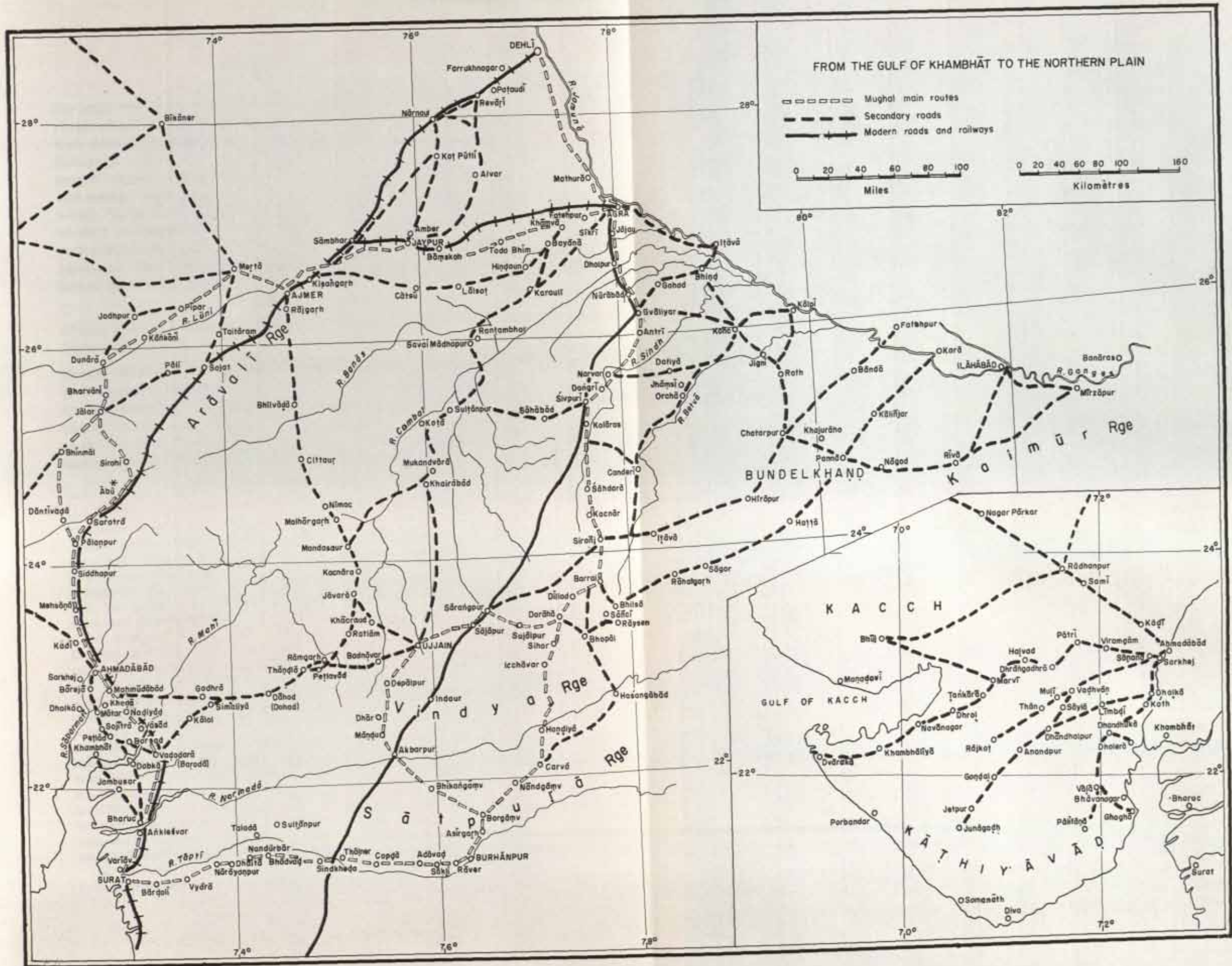
available.

59. If credence be given to Monserrate (*Mongolicae*, 9-15), the road from Sultānpur to Māṇḍu was but a miserable and dangerous trail, a simple short-cut taken by those in haste and travelling with little baggage.

60. Jahāngīr in his memoirs has indicated the itineraries he followed in 1617-18 between Ujjain and Gujarāt: Aḥmadābād, Maḥmūdābād or Khambhāt, Naḍiyād, then Dāhod (Dohad), Rāmgarh, Ujjain (*Tūzuk*, vol. I, 411-15; vol. II, 33-49). At Rāmgarh a branch road led to Māṇḍu via Dhār (*ibid.*, vol. I, 402-11). In 1785 Malet, coming from Vaḍodarā (Barodā), noted the following stages: Vaḍodarā, Kālol, Simaliyā, Dāhod, Thāṇḍlā, Peṭlavād, Badnāvar, Ujjain (Forbes, *Oriental Memoirs*, 1813 edition, vol. IV, 5-37). Excepting the first section (Vaḍodarā-Dāhod), the route taken by the English traveller does not appear to differ from that of Jahāngīr. The modifications in detail constated in the course are to be explained by the evolution of the stopping places. The Mughal emperor indicated twice Rāmgarh (23°3'N, 74°53'E) which was an important fortified town at the beginning of the seventeenth century and is today but a humble village. Malet stopped over at Peṭlavād (23°1'N, 74°52'E), located somewhat farther to the south. This settlement, founded in 1732, was at the close of the eighteenth century a large market town which had entirely eclipsed Rāmgarh (*C.I.S.G., Indore State*, 320-1, 318-9).

61. Thomas Roe (*Embassy*, 1926 edition, 81-4) took the route from Māṇḍu to Ajmer in 1617, but noted only a single stage: Cittaur. Rennell, in his *Road Book* (studied by Usha Masson, *Means of Transport*, 23-4), indicates the major towns along this road, from Peṭlavād onwards: Ratlām, Jāvarā, Kacnāra, Mandasaur, Malhārgarh, Nīmac, Cittaur, Bhilvāḍā, Rājgarh, Ajmer. The route from Ujjain joined this axis in the vicinity of Jāvarā (vide the following note).

62. Little is known concerning the course of the old trail which led from Ujjain to Āgrā. It also evolved in relation to urban changes. During Jahāngīr's era the ancient fortress at Raṇṭambhor (in eastern Rājasthān) seems to have been a road junction; at the end of the Mughal period it had fallen to ruin and the route ran somewhat farther to the west, to Savāi Mādhopur, founded in the mid-eighteenth century. The majority of the stages mentioned by the emperor are impossible to



the large centres in the Doāb and the mid-valley of the Gaṅgā: old routes which were active during the Buddhist and Hindu eras, but then were practically abandoned by voluminous traffic under the Muslims. European soldiers who travelled them in the second half of the eighteenth century have provided information.⁶³ They set out from cities and market towns augmented by commercial traffic, such as Bhopāl, Siroñj, Narvar and Gvāliyar, and proceeded to the princely capitals and markets of Bundelkhaṇḍ and Baghelkhaṇḍ, themselves linked to riparian towns on the Jamunā and the Gaṅgā, such as Kālpī, Ilāhābād and Mīrzāpur. These marginal transit ways contiguous to the Goṇḍvānā forests were above all of regional importance.⁶⁴

Mālava and the New Routes opened by the Marathas in the Eighteenth Century

During the reign of Aurangzeb and his interminable military campaigns to the south of the Tāptī, Mālava, through which the routes from the Deccan necessarily passed, had become a strategic centre of the first order. The Marathas directed a considerable effort towards this region in the first half of the eighteenth century, so as to sever the communications of the Mughal army. The modalities of their settling were to

identify. Nevertheless, it can be assumed that north of Ujjain it went through Khairābād, Mukandvārā, Sultānpur, Raṇṭambhor (whence a trail led directly to Ajmer), Bayānā, Fatehpur Sīkrī and Āgrā (*Tūzuk*, vol. I, 345-52; vol. II, 49-64; vol. I, 340-5; vide also Roe, *Embassy*, 329-42). In 1776, Modave went from Āgrā to Koṭā via Karaulī and Savāi Mādhopur, then continued on to Ujjain by way of the Mukandvārā Pass, Bhānpura, Mandasaur, Jāvarā and Khācraud (*Voyage*, 459-500). He specifies that the direct route from Koṭā to Ujjain proceeded directly southwards from Mukandvārā (*ibid.*, 489).

63. Tavernier (*Travels*, vol. I, 92-6) tells us that mid-way between Āgrā and Ilāhābād, to the west of the confluence of the Seṅgar and Jamunā rivers, a branch road led directly to Siroñj. It is not again mentioned in the accounts of travellers until the end of the eighteenth century, when the English *Company* dispatched soldiers to explore the region so as to discover shorter ways between the mid-valley of the Gaṅgā and Bombay. The itinerary indicated by Tavernier seems to correspond with that taken in 1776 by Colonel Upton from Kālpī to Narvar via Datiyā (vide the map prepared by W. Smith which was reproduced in Macpherson, *Soldiering in India*). In 1778, General Goddard en route to Surat passed somewhat farther to the east through Chatarpur. Law de Lauriston (*Mémoire*, 519-35) travelled along the passageways of Bundelkhaṇḍ and Baghelkhaṇḍ between 1757 and 1761 and left a list of itineraries which he had followed (*ibid.*, map of the region between Dehlī and Paṭnā). Rennell utilized this diverse information in his *Bengal Atlas* and his large map of India in 1792. We reproduce here (Fig. VIII), within the triangle formed by Āgrā-Burhānpur-Mīrzāpur, the road links which he indicated.

64. According to Tavernier (*op. cit.*, vol. I, 92-6), the passageway from Kālpī to Siroñj was shorter and allowed one to save ten days' journey, but the merchants

have lasting consequences for the evolution of the road network in this zone.

Around 1730 they gathered near the eastern border in the region of Sāgar and penetrated the province in the vicinity of Korvai. Once firmly established in the south-west, the ferrying points of Barvāha and Maheśvar (which became the capital of Ahalyā Bāi in 1766) came to assume importance; that at Haṇḍiyā was practically abandoned because it granted access to territories hostile to the Marathas, such as Bhopāl. At the same time, a new city, Indaur, which had been founded in 1715 on the site of a military camp, increasingly began to attract the large currents of land traffic. Towards the middle of the century the Maratha armies, wanting to proceed to Rājputānā, passed by way of Ujjain and Koṭā; while those who went to Dehlī made a detour at Śivpurī, to the east of Koṭā, so as to reach Narvar and Gvāliyar. Thus were formed new transit ways serving the towns of western Mālava, while to the east the old route from Haṇḍiyā was abandoned. Siroṇj was directly affected and lost definitively a greater part of its activity.⁶⁵ Examining the road map established by Raghubīr Siṅh⁶⁶ (Fig. IX), one sees how through successive appropriation of various sections the British main road, developed between 1840 and 1860, shaped its course from Mumbāi (Bombay) to Āgrā by way of Khalghāt (1.5 km west of Akbarpur), Indaur, Sāraṅpur, Śivpurī and Gvāliyar.

Fords and Ferries on the Narmadā

The geo-historian studying the evolution of the different routes in Mālava cannot but be astonished at the permanence of the fords and ferries on the Narmadā, in particular those at Maheśvar and Akbarpur. The former, as demonstrated by archaeological excavations and indicated by ancient texts, was since the protohistoric period, under the name of Māhiṣmatī, an oft-frequented ferrying point; it was still fully active at the close of the eighteenth century.⁶⁷ The latter, located some 15 km westwards, was generally taken under the first Mughals, then

preferred the detour through Āgrā and took the main road, which was better maintained and more certain. The trails from Bundelkhaṇḍ often vanished in the jungle and were not favourable to large-scale traffic. Vide in Sarkar's *Hist. of Aurangzeb* (vol. I, 11) the account of the difficulties encountered by Śāhjahān's armies at the time of their 1625 campaign.

65. The evolution of the road network in Mālava between 1695 and 1765 has been studied by Raghubīr Siṅh in his substantial thesis, *Malwa in transition*, 328-9; we have reproduced here his conclusions.

66. *Ibid.*, f.p. 1; the author has however neglected to indicate for each route the sources he has utilized.

67. As states Modave, who visited the city in 1777 (*Voyage*, 504-7).

seems to have suffered, as of Šāhjahān, at the concurrence of the Haṇḍiyā ford which channelled to a predominant extent the military traffic to the Deccan. The Maratha conquest, restoring the western routes, revived it and the English constructed in near proximity (at Khalghāt) a bridge over which their main road from Mumbaī to Āgrā had to pass. The destiny of these ferries strangely resembles those of Uṇḍ and Aṭak on the Indus as studied by Foucher (*vide supra*, 31).

From these axes in Mālava branched off, south of the Tāptī, the passageways which led to the heart of the Deccan and the eastern coast.

6. From the Gulf of Khambhāt to the Kṛṣṇā and the Āndhra Coast

a. THE GREAT TRANSVERSAL

The Urban Nodalities

It is probable that there existed, at least at the beginning of the Christian era, an important trade route from Bharuc to the deltas of Āndhra via Paiṭhan and Ter;¹ however, the fate of this route is unknown. Only little information is available concerning exchange and communication in this region of the Deccan whose tempestuous history down to the eighteenth century resulted in the frequent shifting of the centres of influence and, in consequence, effected regional variations of the transit axes.

Nevertheless, during the Muslim period certain nodal points appear by their relative permanence to have contributed to the stabilization of the network: firstly, Daulatābād (or Devagiri), one of the Deccan's oldest fortresses, capital of the empire in 1339, supplanted in the seventeenth century by Aurangābād, located some 15 km to the south-east; then, Gōlukonḍa, strategic point, Outb Śāh capital in 1512, replaced by Haidarābād subsequent to the Mughal conquest; finally, the rich deltas of Āndhra which were necessarily to constitute poles of attraction for commercial traffic. It was then at Macilipattanam, principal outlet of the Deccan, that the main transversal route terminated.

Admittedly, it is difficult to specify in detail the main lines of the

1. According to *Periplus* (51), in the third century A.D. merchandise from the coast was transported to Barygaza via Tagara and Paethana. As J.F. Fleet has shown ('Tagara', 'Tor', *J.R.A.S.*, 1901, 537-52), the merchandise which was conveyed to Barygaza (Bharukaccha, Bharuc) and passed through the cities of Tagara (Ter) and Paethana (Pratiṣṭhāna, Paiṭhan) came not from the west coast, but from the eastern littoral, in particular from the deltas of Āndhra. We have seen (*supra*, 48 n. 10) the possible course of this route from Bharukaccha to Pratiṣṭhāna. From there it would have served Ter and Kalyāṇi and, to the south-east of the Haidarābād region, it would have divided into two branches; the one leading to Macilipattanam, termination point of the maritime traffic from the Far East, and the other to Vinukonḍa, which tapped the commodities from the Coromandel Coast. This course corresponds to geographic and historical conditions. The Āndhra kingdom extended diagonally from the Gulf of Khambhāt to the mouth of the Kṛṣṇā; this route must have linked its capital, located on the delta not distant from Macilipattanam, to the towns on the Upper Godāvarī.

road network. On the peninsula, which had never been entirely conquered by the northern empires, the transit ways would appear to have been of a more uncertain character than in Hindusthān, where the great sovereigns were at all times concerned with communications. Their courses are not so easily followed, all the less so because they, in some regions, separate into several branches, which would seem to indicate that they were not entrenched to such an extent as had been the imperial highways.²

From the Tāptī to the Delta of the Kṛṣṇā³

There were during the Mughal period seldom-frequented passageways proceeding from Surat to Aurangābād which crossed the difficult Baglān passes (south-east of Surat).⁴ The main route, however, went up the Tāptī Valley to the vicinity of Navāpur, then traversed the northern extremity of the Ghāṭs and, by way of Tahārābād, reached the regional metropolis founded by Aurangzeb.⁵

From Aurangābād one proceeded to Pāthri,⁶ where there was a

2. Upon consideration of the accounts of the various travellers who journeyed along the main roads radiating from Āgrā to Surat, Lāhaur or Paṭnā, it is noticed that all indicate almost the same stages from one city to another, which is to say, they describe the same course. On the other hand, the itineraries provided by those who visited the South of the peninsula vary considerably from one account to the next, reflecting an urban instability (caused by the ravages of war) to which the transitways needed necessarily adapt themselves.

3. We utilize for the beginning of the seventeenth century the information of two Dutchmen, Van Ravesteyn and Van den Broecke (1616-17); for the second half of the seventeenth century, the accounts of three French travellers, Tavernier (1645, 1653), Thévenot (1666) and François Martin (1670 and 1680); finally, for the eighteenth century, the journal of Anquetil Duperron (1758).

4. Van Ravesteyn crossed the Ghāṭs at the Pimpri Pass; Van den Broecke, coming from Gaṇadevī, proceeded up the valley formed by the Ambikā River, then by way of Anaval, Unai, Kalambā, Kohler, Vanī, Vadner, Pāṭodā, Devathan, Lāsūr, arrived at Daulatābād (*J.I.H.*, 1938, 141-4).

5. Tavernier (*Travels*, vol. I, 120) and Thévenot (*Travels*, 102) mention the following stages: Surat, Bārḍoli, Vyārā, Navāpur, Pimpalner, Tahārābād, Virgāv, Satānā, Umbrāne Aṅkāi, Taṅkāi, Lāsūr and Aurangābād. Anquetil Duperron (*Zend*, t. I, I, CCLIV-CCLXX) gives a very detailed itinerary (he cites over fifty villages) roughly corresponding to the route mentioned by his two compatriots. Rennell reproduced the major stages thereof on his map of 1792 (*Memoir*). In 1645 Tavernier (*op. cit.*, vol. II, 16) followed a different route setting out from Pimpalner which went through Nāmpur, Pāṭane, Sākore, Vāklā, Devgāv and Daulatābād. François Martin (*Mémoires*, t. II, 260-7) leaving Aurangābād in 1681 proceeded northwards by means of a route difficult to identify as far as Dharaṅgāṃv, whence he followed the left bank of the Tāptī.

6. Stages: Aurangābād, Pipri, Ambad, Devgāv, Pāthri (Tavernier, *op. cit.*, vol. I, 119-20; Thévenot, *op. cit.*, 112).

choice between two main branches leading to Haidarābād; the one passed through Bidare (Bīdar), the old capital of the *Bahmanī* kingdom,⁷ while the other, formed by several smaller ramifications, extended along either side of the Godāvarī and served Indūru.⁸

The roads coming from Burhānpur, which enabled interchange between the plains of the North and the peninsular plateau, entered this transversal line at Aurangābād⁹ and at Pāthri,¹⁰ uniting thus Hindusthān and the Deccan.

From Haidarābād to the eastern coast, the old route seems to have hesitated among the several trails which extended along either side of the present-day road,¹¹ the course of which goes back to the second half of the eighteenth century.¹²

7. Stages according to Thévenot (*ibid.*, 150): Pāthri, Rāmpuri, Sāvargāv, Rājūra, Udgir, Marrag, Bidare, Kohir, Pañcnigal, Momanpēta, Eniktala, Haidarābād. François Martin (*op. cit.*, t. II, 252-8) followed roughly the same route in 1681. Modave (*Voyage*, 533-45) took in 1776 a route which traversed the Upper Godāvarī at Sāhgaḍ, east of Paithan, and by way of Gevrāi, Pimpalner, Dhārūr, Renāpur and Bhālki, arrived at Bidare (Bīdar).

8. Thévenot (*op. cit.*, 112) in 1666 passed through Manvāth, Parbhanī, Lāsīnā, Nānded, where he crossed the Godāvarī; then via Pātodā, Kuṇḍalvāḍi, Indūru or Nizāmābād, Indālvai, Bīknūru, Medcal arrived at Haidarābād. Tavernier (*op. cit.*, vol. I, 120) at the time of his journey in 1653, leaving Pāthri took a route which by way of Pālam, Kandhār and Logāv, joined the former at Indūru. François Martin (*op. cit.*, t. II, 255-65) followed approx. the same itinerary in 1670. Tavernier (*op. cit.*, vol. I, 119) took in 1645 from Nānded and Pātodā a slightly different route on the left bank of the Mānjarā, then via Sāntapur, Satulanagar and Śaṅkarapalli reached Haidarābād. Rennell, on his map of 1792, indicates an intermediary route by way of Bodhan, Birkūru, Banasvāḍa, Meḍak, which met with the former at Masāyipēta. He also indicates a cross road linking Kuṇḍalvāḍi and Bidare, but we have not been able to identify its stages. It should be noted that d'Anville (map of 1752) and Orme (map of Southern India, in *Hist. Fragments*) have made serious errors in mapping the information provided by travellers. They place the route from Bidare to the north-east of that from Indūru, whereas it is, in fact the other way around. One understands even less this mistake on the part of Orme as he had at his disposal a map of the region established subsequent to Bussy's marches. Probably he had preferred to copy d'Anville.

9. Tavernier (*op. cit.*, vol. I, 121) mentions a direct road leading from Burhānpur to Daulatābād. It passed through Ajantā, as indicated on Rennell's map of 1792. Modave (*Voyage*, 512-16) made halt at the following places: Vāroḷi, Edalābād, Hartāle, Bodvaḍ, Yevatī, Fatchpur, Ajantā, Pāthri, Cavak and Aurangābād.

10. Stages according to Thévenot (*op. cit.*, 180): Burhānpur, Malkāpur, Rohankheḍa, Deūlgḥāt, Jāfarābād, Sindkheḍa, Gohegāv, Pāthri.

11. The identification of Tavernier's stages (*op. cit.*, vol. I, 139-42) as well as those of Thévenot (*op. cit.*, 146-7) is difficult, because they cite but few cities and only several villages which are not found on modern maps. The course of the old route seems to have passed by way of Haidarābād, Hayātnagar, Paṅgal (6 km north-east of Nalgonda), Amaṅgal, Anantagiri, Penigaṅciprōlu, Partiyāla, Mad-dūru, Vuyyūru, Nidumolu, Gūḍūru and Macilipatṭaṇamu.

12. The travellers of the second half of the seventeenth century mention stop-

Thus, the traffic between the Gulf of Khambhāt and the deltas of Āndhra, very active prior to the decline of the Mughal empire,¹³ was not channelled by a single artery; rather, in accordance with the seasons or prevailing security conditions, could divide into numerous small veins which joined again in near proximity of the urban centres.

The course of the coastal route linking the Deccan with the plain of Orīṣā would appear to have been even more variable and unstable.

From Macilipattanam to Jagannātha-Purī

Between the Kṛṣṇā and Lake Cilikā extends a strip of land bordered to the west by densely wooded reliefs, amply open on the east to the sea, little favoured by land communications. The history of the ill-provided track which passed through this territory, following along the mountains so as to avoid the marshy coastal front, is not known. Documents from the seventeenth or the first half of the eighteenth century only describe sections thereof.¹⁴ The entire course was noted later, at the time of the Franco-British rivalry.¹⁵

It was possible to make one's way from Macilipattanam to Rājamahēndravaramu along the coast and the western arm of the Godāvarī,¹⁶ or indeed to pass through the interior of the territory via Ēlūru. From there, the passage followed roughly the orientation of the present

overs which correspond to the present-day route: Haidarābād, Malkāpuram, Kaṭṭaṅgūru, Nakarikallu, Suryāpēṭa, Munagāla, Nandigāma, Koṇḍapalle, Bejavāda and Macilipattanam. Vide Rennell's map of 1792, Heyne, *Tracts*, 247 sq., etc.

13. European sources make constant allusion to the transport of merchandise between Surat, Haidarābād and Macilipattanam.

14. Thévenot (*op. cit.*, 148) (1666) indicates only a few stages: Palākollu, Bhīmuniṣṭānamu, Śrīkākuḷamu, Baṅgāl. S. Master (*Diaries*, vol. II, 158-62, 170-7) (1679) scarcely goes farther than Mādhavāyapāḷemu (Madapollam) and Ēlūru. A. Hamilton (*New Account*, 1930 edition, vol. I, 209-19) only travelled the segment from Gaṅjām to Bāleśvara. It is nonetheless significant that no account from this period provides the detailed stages of a continuous route linking the deltas of Āndhra to those of Orīṣā.

15. It was not until the second half of the eighteenth century, subsequent to the transfer of the northern *Sarkār* to Bussy, that one began to acquire information concerning this region. When later the English *Company* took possession there and its armies marched through the region, more precise details became available. Anquetil Duperron, who crossed the country in 1751, was the first to describe the *Sarkār* route. Rennell utilized in his map of 1792 diverse documents provided by the English military, including Pearse's itinerary (1781) along the eastern coast (vide *Memoir*, 242-3).

16. This corresponds in part to S. Master's itinerary (*Diaries*, vol. II, 158-62, 170-7).

road, serving the towns in the plain as far as Gañjām (avoiding Viśākhapaṭṭaṇamu which was at that time a minor settlement); then, rather than proceeding to the west of Lake Cilikā, as does the modern road, it continued directly to Purī, traversing the mouths of the laguna.¹⁷

The permanence of this course, which excepting short segments has changed but little until present times, is due to the natural conditions which scarcely allow of an alternative between the high enclosure of the Ghāṭs and the littoral. However, it should not be supposed that this passage way had served as a link between the delta of the Gaṅgā and the southern plains. There was no 'Grand Trunk Road' from Baṅgāl to Āndhra; merely an irregular route, locally animated, for it was by way of sea that the greater part of the exchanges were effectuated.¹⁸

b. KOṆKAṆ AND THE MAHĀRĀṢṬRA PLATEAU

Between the great transversal route and the western coast, within a large triangle whose vertices were Surat, Govā (Goā) and Haidarābād, the gigantic staircase of the Ghāṭs separates the Mahārāṣṭra Plateau, drained by wide valleys to the Bay of Baṅgāl, from the narrow, low-lying region of Koṇkaṇ.

Our knowledge of this zone, based upon European sources, is quite meagre. Since the arrival of the Portuguese, the *companies* in India were quite well-informed regarding the coastal settlements,¹⁹ and also concerning certain trails climbing the steep slopes of the mountainous barrier. However, they possessed very little information pertaining to the passageways of the plateau, which had a very unstable political history, particularly during the prolonged conflict which opposed the Marathas and the Mughals.²⁰ It will some day be possible to avail of the substantial indigenous sources; but, for the present they are hardly of use, as they have not as yet been analysed from the point of view of

17. Anquetil Duperron, *Zend*, t. I, LXXXVIII-XCIX; *Road Book* by Rennell, the stages of which have been identified by U. Masson, *Means of Transport*, 38-40: Macilipattanam, Ēlūru, Guṇḍugolanu, Anantapalli, Rājamahēndravaramu; or, Macilipattanam, Pedapattanam, Mogalituru, Penugonḍa, Rājamahēndravaramu, then Yellamañcili, Anakāpalle, Vijayanagaramu, Śrīkākuḷamu, Kaṭiṅga-pattanam, Tekkali, Iccāpuramu, Mantridi, Gañjām, Māluḍ, Purī.

18. Vide Bowrey, *Geog. Account*, 120-2, and Heyne, *Tracts*, 251.

19. The maps of India from the sixteenth and seventeenth centuries, generally fanciful as regards the interior of the country, represent the coastline with an astounding precision (vide our *Recherches*, 82-4, pl. XXIII).

20. Even at the close of the eighteenth century Europeans had but a summary knowledge thereof; one need only consult Rennell's map of 1792 pertaining to this part of the country, which is schematic and inexact regarding several points, to convince oneself of this.

road networks.²¹ Of this ensemble, one can comprehend only several lines.

The Coastal Border and the Ghāṭs

Longitudinal communications on the coastal strip, striated by rivers and where plains and rocky surfaces alternate, has always been difficult. Land travel was closely linked with coastal navigation, which it in areas completed.²² The road from Surat to Mumbai (Bombay), while always seeking to avoid the salty marshes of the littoral, neared the sea in order to serve the numerous small ports of the coastal plain by following a course which has been revived by the present railway.²³ To the south the tide penetrated yet more deeply inland and the roadway linked the towns situated at the back of an estuary, such as Khed, Ciplūn, Rājāpur, thus evading the seafront and the coastal settle-

21. D.M. Wagb, in his thesis (*Geographical Factors in the Rise and Fall of the Marathas*), has drawn up several maps of the ancient routes in Koṅkaṇ and western Mahārāṣṭra which are very questionable. The first (No. 22, *Old Routes of West Maharashtra*) appears to utilize information from the first half of the nineteenth century as compiled in the *Bombay Gazetteer*; the second (No. 26, *Forts protecting Ports, Towns and Highways in West Maharashtra*) shows a series of lines passing near fortified points; the third (No. 68, *Fortified Headlands, Ports, Towns and Old Trade Routes of the Koṅkaṇ*) connects several large ports on the coast with several towns of the plateau by means of continuous lines. Other than the fact that the sources employed to compose these maps are not mentioned, the method would seem to be artificial. The courses of the routes are not based upon detailed itineraries, nor upon vestiges of a past network. It is only an effort to present the old road links of Mahārāṣṭra. To this type of easy synthesis we prefer a less ambitious but more critical work.

22. Tavernier (*Travels*, vol. I, 142-46) states that to proceed from Surat to Govā one could follow the road along the coast, but that it was in very bad condition from Damaṇ to Rājāpur, and that it was more practical to take a boat calling at various ports of the Koṅkaṇ (he undertook twice the voyage, in 1641 and in 1648); however, this was a dangerous solution because of the *malabārī* pirates infesting the sea. Abbé Carré (*Travels*, vol. I, 166-220), who in 1672 had to journey from Surat to San Thome, did not find a boat sailing for the Coromandel Coast. Fearing the Dutch fleet, which severely controlled the seaway (it was at the time of the Dutch war), he thus took the littoral route, but made use whenever possible of coastal navigation from Surat to Damaṇ, the best segment, and from Vasāi (Bassein) to Caul.

23. Monserrate (*Mongolicae*, 1-8) and Jourdain (*Journal*, 125-8) have given the names of several stages between Surat and Damaṇ; Abbé Carré (*Travels*, vol. I, 166-80) has listed the principal rest-houses between Damaṇ and Vasāi. The most detailed itinerary, however, is provided by Anquetil Duperron (*Zend*, t. I, I, CCXIX-CCXXVII), who journeyed from Surat to Thāne in 1760. Rennell has utilized the information given by General Goddard in his map of 1792 (*Memoir*, 223). Stages: Surat, Sacin, Navasārī, Gaṇadevī, Valasād (Bulsar), Damaṇ, Dāhānū, Māhīm, Vasāi.

ments, to which it was connected by means of byways.²⁴

Dominating these lowlands rise the high walls of the Ghāṭs which could be surmounted at the passes, climbing the steep, wooded slopes. These indentations in the line of summits had been travelled since very early times by bearers and pack animals, because they channelled all the salt traffic from the coast to the interior,²⁵ and linked the towns of the plateau with the maritime ports (vide *supra*, 48-51 regarding the ancient links). We cannot, however, specify their utilization during the Mughal period. Probably only a systematic survey of archaeological vestiges or of local traditions would provide results. To the north-east, where the chain slopes down and allows of easy access to the valleys of the Godāvarī and the Bhīmā, the *Peśvā* were concerned with the development of Nāne, Mālśej and Kusur.²⁶ Moreover, Fryer used the former in order to proceed to Junnar at the close of the seventeenth century.²⁷ Farther to the south numerous rest-houses still today line a very old pilgrimage route which led from Ratnāgiri to Paṇḍharpur by way of the Tivre Pass.²⁸ European sources provide information concerning the Bijāpur passages.

The Roads from Bijāpur and from Gōlukonḍa

They formed two branches. The first, setting out from Dābhol, one of the most important ports in Koṅkan between the fourteenth and eighteenth centuries, crossed the Kumbhārli Pass.²⁹ The second, starting from the Portuguese metropolis of Govā, followed in more rounded relief a depression that opened a passage to the basin of the Kṛṣṇā,

24. The route followed by Abbé Carré (*op. cit.*, 181-220): Mumbai (Bombay), Caul, Aṣṭamī, Goregāv, Khed, Cipaḷūn, Saṅgameśvar, Rājāpur, Khārepāṭaṇa, Bāndā, Bicolim, Govā.

25. Fryer, *New Account*, vol. I, 345; Mandelslo, *Voyages*, Didot edition, t. 37, 245.

26. *Bombay Gazetteer*, vol. XVIII, Poona, 141.

27. Fryer (*New Account*, vol. I, 307-22, 345 sq.), sent by the governor of Bombay to Junnar to meet with a Mughal chief in 1675, mistook the road and crossed the harsh Avapā Pass; he returned to Vasāi by way of Nāneghāt. Dispatched on a mission to Śivājī, he also travelled the route from Caul to Raygaḍ via Aṣṭamī and Nizāmpur (*ibid.*, 198-203).

28. At which point it divided into two branches: one which passed through Yelgāv, Karāḍ, Surli and Māyanī, while the other traversed Aṣṭe, Tāsgāmv, Viṭā and Āṭpādī (*Bombay Gazetteer*, vol. XIX, Satara, 194).

29. Mandelslo (in Olearius, *Relation*, t. II, 241-3) gives the stages of the route from Dābhol to Bijāpur and emphasizes the importance of this route which channelled traffic from the Deccan to the Arabian Sea. His itinerary has been reproduced by Rennell in his 1792 map (*Memoir*, 250). Stages: Dābhol, Cipaḷūn; Kumbhārliḡhāt, Heḷvāk, Karāḍ (?), Kāsegāv, Uraṇ-Islāmpur, Aṣṭe, Miraj, Araṅg and Athnī.

either through Rāmghāt, or by way of Ambolighāt, and joined then the former in the vicinity of Athnī before arriving in Bijāpur.³⁰ During the eighteenth century it was doubled by a more convenient route which crossed the mountain at Tinaighāt,³¹ a course which has been retained by the railway.

Leaving the regional capital, the road continued to the north-east in the direction of Gulbarga, the celebrated Muslim pilgrimage centre, then to bifurcate towards Gōlukoṇḍa.³²

This was, from the direction of the Arabian Sea, the great commercial artery of the Deccan kingdoms until their conquest by Aurangzeb at the close of the seventeenth century.

The Heartland of the Marathas

To the north of this line various passageways led to the heart of Maratha country. During the interminable Mughal campaigns it had been traversed by countless armies which cleared passages buried beneath the jungles of the Ghāṭs³³ and probably opened new accesses onto the plateau.³⁴

30. This was the way usually taken by European travellers. It is mentioned by Tavernier (*Travels*, vol. I, 146) and described in detail by Abbé Carré (*Travels*, vol. I), who passed through Rāmghāt (approx. 50 km) east of Belgāmv. Stages: Govā, Rāmghāt, Candgaḍ, Nesari, Jāmbūlvāḍī, Hākarṇī, Khānāpur, Hukēri, Rāybāg, Athnī, Aigale, Telsāng, Tikota, Bijāpur. Mandelslo (in Olearius, *Relation*, t. II, 239-41) indicates roughly the same course, except for the first segment from Govā to the plateau by way of the Āmbolī Pass (located 15 km north of the preceding). Careri (*Travels*, 207-17, 267-73) journeyed from Govā to Galgali, on the Kṛṣṇā (51 km south-west of Bijāpur); however, not familiar with the region, he went astray and made a long detour through the south-west. Returning, after having passed through Mudhōl, Yādavād, he became lost in the forest, followed the tracks of a caravan and returned to Govā by way of Belgāmv (a village without importance at that time), Sahāpur, Jambōṭi. Abbé Carré (*op. cit.*, vol. I, 226-7) mentions a significant traffic along the track of the Ghāṭs.

31. The itinerary followed by Anquetil Duperron (*Zend*, t. I, I, CCXV-CCXXV): Govā, Poṇḍā, Tinaighāt, Khānāpur, Gōkāk, Terḍal, Aināpur (some 15 km from Athnī).

32. Carré, *op. cit.*, vol. II, 317-26.

33. In 1701, Aurangzeb, wishing to seize the Viśālgaḍ fort in the Western Ghāṭs, developed Āmbāghāt (situated 25 km south of the South-Tivre Pass) so as to be able to pass through with his army. Within a week of uninterrupted work in a hostile zone of dense forest, the sappers and stone-cutters were able to make a wide road crossing the pass (J. Sarkar, *Hist. of Aurangzeb*, vol. V, 140).

34. In these vast movements towards Aḥmadnagar, Puṇe, Bijāpur, Śolāpur, the frequency of passage in certain areas has not been studied, nor has an attempt been made to distinguish the veritable roads from chance trails, traced according to strategic necessity. Finally, the Maratha maps of Bombay, Puṇe and Haidarābād indicating the routes taken by the soldiers during their expeditions have not as yet

The most frequented were those leading from Aurangābād, Aurangzeb's general quarters, to Aḥmadnagar and Bijāpur.³⁵ But when the Maratha empire had chosen a new capital replacing Sātārā, the royal residence, Puṇe became the point of convergence of the old road arteries. The European sources from the second half of the eighteenth century have described several of them.³⁶ To the south there was a road which led to Karṇāṭaka by way of Koregāmv and Tāsgāmv, east of the modern highway from Puṇe to Belgāmv.³⁷ Another proceeded north-

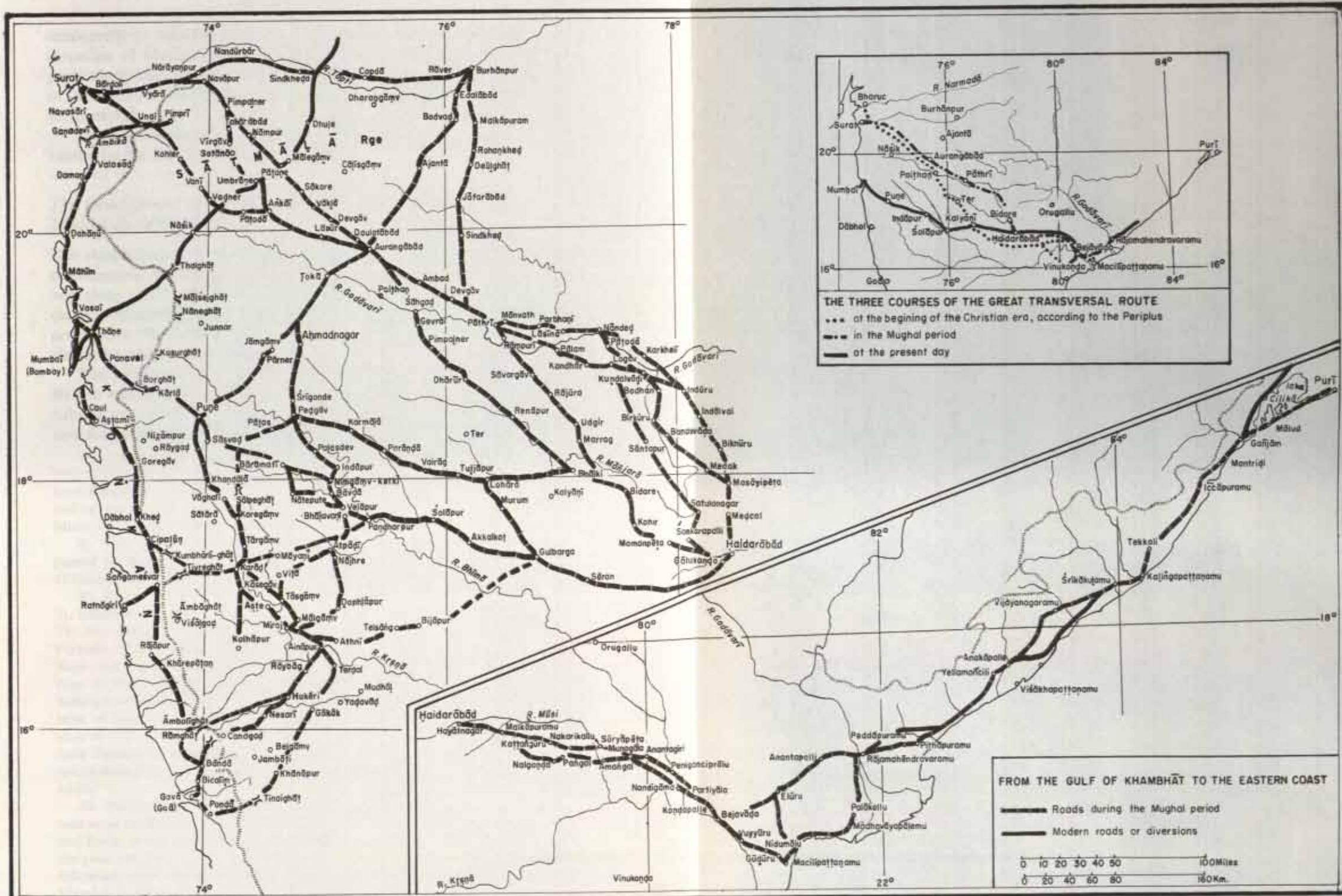
been analysed (vide. C.D. Deshpande's article 'A Note on Maratha Cartography', *Indian Archives*, vol. VII, 87-94, 4 plates, which we have summarized in our *Recherches*, 110-11, pl. XXX).

J. Sarkar, in his monumental history of Aurangzeb, has identified the stages of numerous marches undertaken by the Mughal armies. We have noted in particular Jai Singh's campaign of 1666 in the valleys of the Bhīmā and the Mānjarā (*Hist. of Aurangzeb*, vol. IV, 99-100 and n.), the expeditions of Dilīr Khān in the Bijāpur area (*ibid.*, vol. IV, 133-4), the invasion of the southern Koṅkaṇ by Sāh 'Ālam in 1683 (*ibid.*, vol. IV, 248-50), the route followed by Afzal Khān in pursuit of Śivājī in 1659 (*ibid.*, vol. IV, 32), Sāistah Khān's offensive against Śivājī, from Aḥmadnagar to Puṇe in 1660 (*ibid.*, vol. IV, 38-40), Jai Singh's march on Bijāpur in 1665 and the Mughal retreat to Parāṇḍā (*ibid.*, vol. IV, 92-5), Aurangzeb's marches subsequent to the submission of Gōlukonḍa (1687) (*ibid.*, vol. V, 3-5), his campaign of 1700, and the march on Khelnā, the retreat of his troops (*ibid.*, vol. V, 138-46 and n.), then the route he took in 1638 from Bijāpur to Gōlukonḍa by way of Gulbarga and Bidare (*ibid.*, vol. IV, 303, 328).

35. Manucci (*Storia*, vol. II, 171-3), coming from Govā in 1668, crossed the territory of Bijāpur and via Paṇḍharpur and Parāṇḍā reached Aurangābād. The *Cahār Gulšan* (CXII-CXIII) gives several stages of the route from Bijāpur to Aḥmadnagar: Nimgāmv-ketkī (south-west of Indāpur), Śrigoṇḍe and Māṇḍavgāv. Aurangzeb, returning from the southern Koṅkaṇ in 1702, joined this route to the west of Paṇḍharpur. The stages as identified by Sarkar (*Hist. of Aurangzeb*, vol. V, 145 n.) are as follows: Miraj, Mālgāmv, Daphlāpur, Nājhre (on the Māṇ River), Bhājavani, Aklūj, Bāvḍā, Indāpur, Paḷasdev (on the Bhīmā), Peḍgāv (south of Śrigoṇḍe).

36. Information concerning the Maharaṣṭran communication routes becomes more complete and more precise following the decline of the Mughal empire and the establishment of more frequent relations between the English *Company* and the *Peśvā*.

37. This was the route taken by Anquetil Duperron coming from Govā in 1758 (*Zend*, t. I, I, CCXV-CCXXVII). Although numerous stages cannot be identified on a modern map, his itinerary can be quite well followed. After having crossed the Kṛṣṇā at Aināpur, he left the Bijāpur road to proceed northwards by way of Mālgāmv, Tāsgāmv, Nhāvī, Koregāmv, Vāgholī, Khaṇḍālā and Puṇe. The major stages are to be found on Rennell's map of 1792. To the north of Koregāmv the old Maratha road seems to have followed a different course which corresponds to the present railway line crossing the Sālpe Pass. This pass would have been developed subsequent to Śivājī and vestiges of the former passageway remain. The *Bombay Gazetteer* (vol. XIX, Satara, 194) states that at the time of the *Peśvā*, the route



X. From Surat and Govā (Goā) to Haidarābād. From Haidarābād to Puri.

eastwardly to Aḥmadnagar and Aurangābād.³⁸ To the east, from the direction of Haidarābād, the roads in the mid-valley of the Bhīmā, particularly that which served Paṇḍharpur, the large pilgrimage centre of the Marathas, and Śolāpur, permitted of exchanges with the Nizām's territories.³⁹

This convergence of roads towards the capital was later to be accentuated by the development of Mumbai.

The Development of Mumbai (Bombay) and the Creation of the Modern Road Network

The establishment of the English Company on the Thāṇe coast and the considerable development of Mumbai, which supplanted Surat at the beginning of the nineteenth century, was to have a decisive influence on the orientation of the road network. Firstly, the search for ways of access into the interior of the country resulted in a revival of activity along the passes of the Ghāṭs.

The proximity of Pune explains that the first road built by the British was that from Borghāṭ.⁴⁰ Nor were the other passes neglected; subsequent to the fall of the Peśvā in 1817, work on the Pimpri, Nāne and Kusur Passes had been considered, but Thalghāṭ gradually chan-

from Karpāṭaka took the Sālpe Pass and that of Nhāvī (to the north-east and south-east of Koregāṃv respectively) and, from there either by way of Tāsgāṃv and Miraj, or Tārgāṃv, Masūr and Karāḍ, arrived at Kolhāpur.

38. The route taken by Anquetil Duperron (*op. cit.*, CCXXIX-CCXXXII) passed to the west of Aḥmadnagar via Pārner and Jamgāṃv and crossed the Godāvarī at Tokā. Vide Rennell's map of 1792.

39. Rennell, in his *Road Book* (studied by U. Masson, *Means of Transport*, 34-5), indicates two roads from Pune to the Nizām capital which joined at Gulbarga. The first passed through Sāsvaḍ, Pāṭas, Pedgāv (north of the Bhīmā), Karmālā, Parāṇḍā, Sendri, Vairāg, Tuljāpur, Lohārā, Jāvalī, Murum and Gulbarga; from there, one reached Haidarābād via Sēran. Malavois, who made the journey from Pune to Putuccēri (Pondicherry) at the end of 1783, followed the latter route, halting however on the short segments at different stages (*Voyage du S. Malavois*, table of itinerary, ms. of the *Bibliothèque de Versailles*). According to Rennell's map of 1792 (*Memoir*, 249), there was a branch road on the first route which led from Tuljāpur to Haidarābād via Bhālki and Bidare. Colonel Upton took it on his return from Pune in 1777 (*Asiatic Annual Register for the Year 1804, Miscel Tracts*, 16-24).

40. The members of the unfortunate 1779 expedition spent a week clearing the pass so as to allow the passage of the artillery. The road traversed Thāṇe, Panavel and Kārlā. It was improved in 1804 by General Wellesley; in 1825 Héber speaks of the good condition of the roadway. Further improvements were undertaken in the following years and in 1830 this road was officially opened by the governor of Mumbai (Valentia (1804), *Travels*, vol. II, 108 sq., 151 sq.; *Bombay Gazetteer*, vol. XIII, *Thana*, part I, 318).

nelled the greater part of the traffic to Khāndeś. The main road from Mumbai to Āgrā via Nāsik was developed.⁴¹

These transformations are at the origin of the present network. At the height of the Mughal empire the major trunk roads in this zone terminated at Surat; at the beginning of the nineteenth century they were oriented towards Mumbai, India's new western port. Thalghāt became once again, following centuries of oblivion, the passage obligé from Hindusthān to the Thāne coast, while the roads leading to Haidarābād gradually abandoned the valley of the Upper Godāvāri (via Aurangābād, Nānded) to be established in the Bhīmā Valley. It was thence that the British envoys to the *Peśvā* journeyed at the close of the eighteenth century.⁴²

41. Stages: Thalghāt, Nāsik, Mālegāmv, Dhule and the Sendhvā Pass. Since 1826 Thalghāt had been accessible to carts and in 1844, when the work was completed, haulage replaced transport by pack-animal on this road (vide *Bombay Gazetteer*, vol. XII, *Khandesh*, 207; vol. XVI, *Nasik*, 137).

42. As that of Colonel Upton in 1777 (vide Macpherson, *Soldiering in India*, 307-12).

7. South India

To the south of the Rāyčūru *doāb*, located between the Kṛṣṇā and the Tuṅgabhadrā, extends the southern extremity of the peninsula; the last Hindu bastion to have offered resistance to the Muslim puissance.¹ Indigenous sources, as well as European documents prior to the eighteenth century, provide but little information pertaining to the ancient passageways of this region.² It is therefore not a simple matter to determine the major route links of the past.

Ancient Route Links

The reliefs of the Ghāts to the west with their wild ridges, elevated and wooded, offer almost no ways of communication, thus isolating the western coast from the remainder of the peninsula except between the two pillars of the Nilagiri (Nilgiris) and the ĀNaimalai Hills, where the brusque interruption of the chain allows of easy passage.³ The Pālāk-kāṭu (Pālghāt) Gap has since the beginning of history channelled traffic from Kēraḷa to the Tamil country, as is shown by the study of Roman

1. The Vijayanagara kingdom, founded upon the ruins of the CōLa empire, succumbed in 1565.

2. Even though its coastal border had been known since earliest antiquity, and although western cartographers had at an early date quite correctly mapped its coastlines, the interior of the country remained practically unknown to Europeans until the eighteenth century. Certainly, missionaries had ventured inland since the arrival of the Portuguese, and such travellers as Paes, Nuniz and Barbosa had visited Vijayanagara at the time of its grandeur; their observations were, however, not utilized by the geographers and until the mid-eighteenth century the maps located the Western Ghāts in the midst of the peninsula and gave no topographic indication, other than the ports on the coast (vide our *Recherches*, 102-5 and pl. XXIII). Except for the region located between Haidarabad and Madrās, it was necessary to await the close of the eighteenth century and the Maisūru wars to have more complete knowledge of South India. When the outburst of activities instigated by the European *companies* to ensure pied-à-terre is considered, one is surprised to read in the well-known memoir of Rennell (1782-93) that the Pālghāt Gap had just become known (*Memoir*, 276). Thus, one will not wonder at our ignorance of the ancient roads of the country; all the less so, as it has only been possible to re-construct their history with the support of inscriptions which afford but little space to the communication routes.

3. Nonetheless, this corridor did not play such an important role as that of the Tāpti in Mālava or the 'Gates to Baṅgāl' upstream from Rājmaḥal, because it is located too near the southern extremity of the peninsula to grant access to a vast *hinterland* (East and Spate, *Changing Map of Asia*, 122).

coins⁴ and the texts of the *Saṅgam* period,⁵ as well as by a scrutiny of the toponymy.⁶ Nothing is known relating to the breaches cut into the mountain, with the exception of the small ĀrūvāmoLi (Āramboli) Pass to the far south, which appears to have played an important role.⁷

Neither on the plateau which slopes towards the Bay of Baṅgāl, nor in the coastal plain, nor even on the eastern fringe where the line formed by the mountainous blocks is discontinuous, are there obstacles to hinder communications. Here, there is no characteristic passage obligé; the meshes of the network have been made and re-made according to the evolution of urban centres. The *Saṅgam* literature above all alludes to the routes leading from Kāñcipuram to the large port on the Kāvēri delta on the one hand, and on the other, to KaNNiyākumari (Cape Comorin) while serving Śrīraṅkam, Uraiūr, Karūr, Maturai and KoRkai.⁸ The information provided by the *CōLa* inscriptions concerning the passageways is vague,⁹ and scarcely more than the main lines of the Vijayanagara network can be adumbrated.¹⁰

4. The localization of Roman coins dating from the first century A.D. permits of the assumption that they lined the main route from Muziris (Koṭunnāllūr, Cranganore) to Podukē (Arikamedu) and Khabēris (Tarāṅkampāṭi, Tranquebar), a direct route linking the two coasts and enabling the traders to avoid the dangerous circumnavigation of Cape Comorin (vide our *Recherches*, 27-8, pl. IV, fig. 1 and also our article: 'De la trouée de Palghat et du plateau de Maisur à la pléiade tamoule: liaisons routières anciennes et vestiges de chemins, *B.E.F.E.O.*, t. LXXVIII, 1991, 53-4).

5. *Cilappatikāram*, 10, 11, 25.

6. It will be noted that the Kōyamuttūr (Coimbatore) Plateau, although never having constituted an historical entity, has always conserved its individuality, attested by the survival of its ancient name 'Koṅku'. Also significant is the fact that the Kāvēri and the Amarāvati Rivers had been the meeting point of the three most stable Dravidian kingdoms (CōLa, Cēra, Pāṇḍya). The toponymy proves unquestionably the strategic value of this passageway, as the termination 'pālaiyam', signifying military camp, is found not less than 571 times in the place-names of the Irōṭu (Erode) tāluk which commands the Kōyamuttūr route, as well as that from Maisūru and the delta of the Kāvēri. It is also known that, at the close of the eighteenth century, during the Maisūru wars, this was one of the most disputed zones (vide Spate, *India*, 712 and also our article, mentioned *supra* in n. 4, *B.E.F.E.O.*, t. LXXVIII, 1991, 56 and n. 19).

7. In the ancient Tamil literature it is more frequently mentioned than the Pālghāt Pass (the Ceṅkōṭṭai-Shencottah Pass, was thus probably impassable). Crossed by pilgrims, it was also taken by the different armies of the Southern kingdoms (vide Rao Sahib M. Raghava Aiyangar, *Some Aspects of Kerala and Tamil Literature*, 1948, in particular, 10-13, 'The Southern Approach to Kerala'; 19-28, 'The Mauryan invasion and the Aramboli Pass').

8. *Maṇimekalai*, 6, 7, 9, 26, 28; *Cilappatikāram*, 10, 11, 26, 27, 29. Vide our *Recherches*, pl. IV, fig. 2: 'the routes of Tamil country according to *Saṅgam* literature'.

9. *Ibid.*, 28.

10. The sources are discussed in the following works: Venkata Ramanayya,

The capital was linked to the ports on the Arabian Sea, such as Govā and Honāvar, and to those on the Bay of Baṅgāl, such as PaLavēRkātu (Pulicat), as well as to the cities on the upper Kāvēri, Śrīraṅgaṭṭaṇa and Śivanasamudra. In the eastern plain a route connected the great religious centres, from Kālahasti to Rāmēśvaram.¹¹

Subsequent to the fall of the Hindu empire, the South of the peninsula experienced a protracted period of instability, aggravated by the founding of independent principalities and the Maratha and Mughal incursions, before a new centre of political gravity in the heart of the Maisūru plateau was established at Śrīraṅgaṭṭaṇa on the Kāvēri at the time of Haidar 'Alī and Ṭipū Sultān in the second half of the eighteenth century. We have no information regarding the roadways of the South during that interval, excepting as pertains to those routes leading from Haidarābād to the deltas in Āndhra located to the north of the Coromandel.

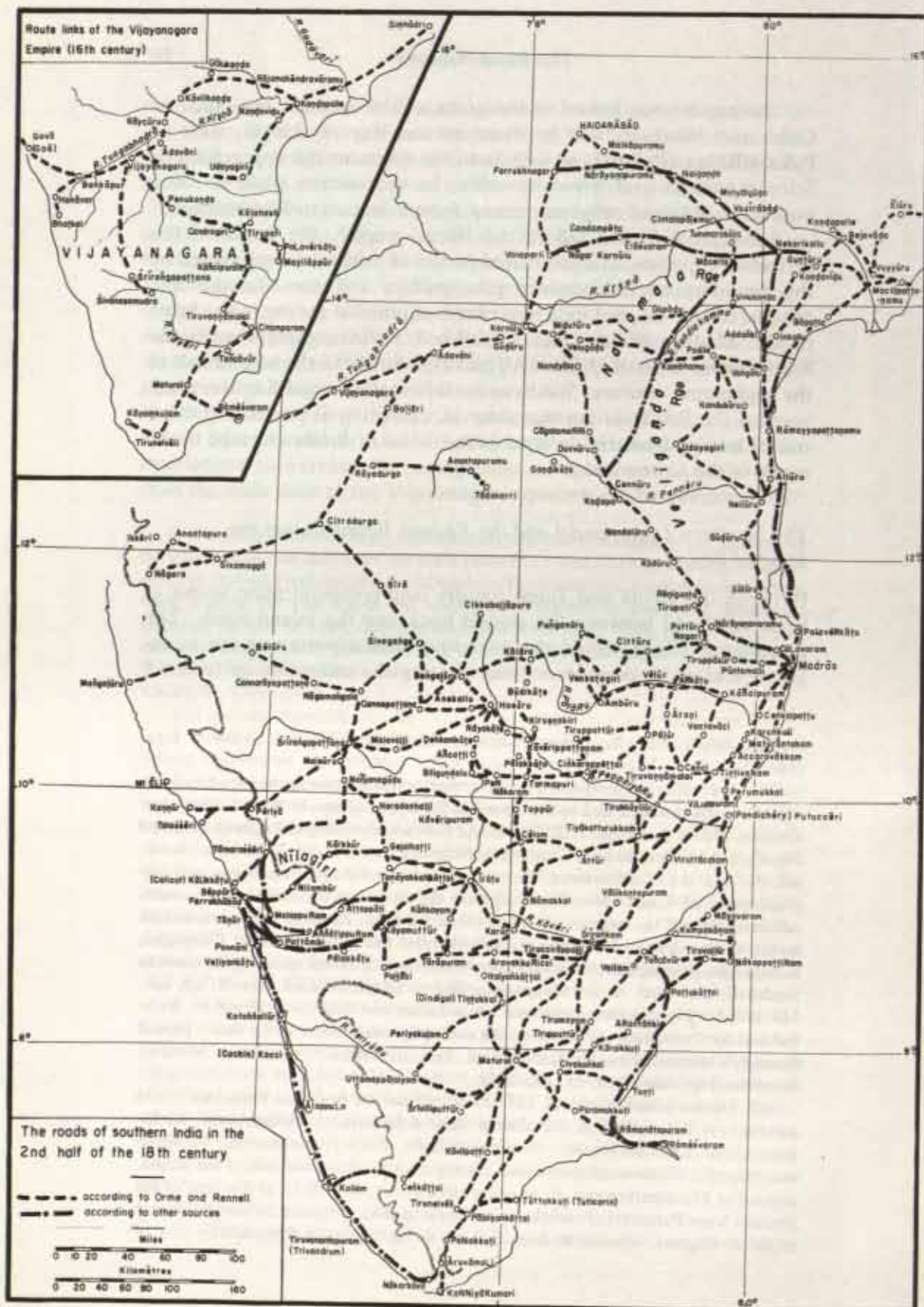
The Northern Coromandel and the Kaḍapa Basins during the Mughal Period

Between the Kṛṣṇā and Tamil country land communication seems to have vacillated between the coastal track and the inland roads. The passageway which served the numerous coastal ports was cut by lagoons and wide, deep rivers necessitating the utilization of ferries.¹²

Studies, 296-7; Dixit, *Economic Conditions*, 223-4; Mahalingam, *Economic Life*, 151-2.

11. According to European travellers, there existed a passageway leading from Vijayanagara to Govā and to Honāvar via Baṅkāpur (Paes, in Sewell, *Forgotten Empire*, 119, n. 1, 120, n. 1, 229, n. 4) and another which led to PaLavēRkātu and Mayilāppūr via Penukoṇḍa, Candragiri, Tirupati (Major, *India*, 7; Barbosa, *Book*, vol. II, 131 n.). Furthermore, the analysis of the military campaigns and the pilgrimages of Kṛṣṇa Dēva Rāya suggests the existence of several other routes radiating around the capital: the first crossed Ādavāni, Rāycūru and continued on as far as the deltas of Āndhra via Kōvilkoṇḍa; the second went to Udayagiri, Koṇḍaviḍu, Koṇḍapalle, Rājamahēndravaramu and, from there, along the coast to Simhādri; the third, to Śrīraṅgaṭṭaṇa and to Śivanasamudra (Sewell, *op. cit.*, 314, 302-4, 126). Another connected Kāyaṅkuḷam and Tirunelvēli (Panikar, *Malabar and the Portuguese*, 96); finally, the main pilgrimage route in the South passed through Kālahasti, Tirupati, Kāncipuram, Tiruvaṇṇāmalai, Citamparam, Maturai, Rāmēśvaram (vide Dixit, *op. cit.*, 224).

12. Master (*Diaries*, vol. II, 125-41) in 1678 set out from San Tome, traversed successively PaLavēRkātu, the alluvial strip of Śrīharikōṭa, Ārumukam, Kottaṭṭaṇamu, Kṛṣṇaṭṭaṇamu, Gaṅgaṭṭaṇamu, Rāmāyapaṭṭaṇamu, Vēṭapāḷemu, Bāpaṭla, Nijāmuṭṭaṇamu and, cutting directly across the arm of the Kṛṣṇā, arrived at Macilipattānamu. F. Martin (*Mémoires*, t. II, 170-7), at the time of his journey from Putuccēri (Pondicherry) to Surat in 1681, followed the same itinerary as far as Bāpaṭla, whence he branched off to the region of Bejavāḍa by way of



Inland, the route crossed Guṇṭūru, Vaṅḡolu (Ongole) and Nellūru, but its course, except in the region of Lake PaLavēRkāṭu, ran always to the east of the present-day road and, especially mid-way, neared the coast.¹³

The direct routes coming from Maratha country or from Ḥaidarābād, after having traversed the Kṛṣṇā in the Mācerla region and having crossed the northern extremity of the Nallamala Range, terminated on this axis in the area of Vaṅḡolu.¹⁴

There were also tracks which passed farther into the interior, in the vicinity of the confluence of the Kṛṣṇā and the Tuṅgabhadra, which followed the Kaḍapa basins leading to the Tirupati temple and the eastern coast.¹⁵ A cross-country road extended diagonally, following

Maṅgaḷagiri.

13. Anquetil Duperron (*Zend*, t. I, I, XCIX-CVII), coming from Macilipatṭanam in 1757, followed the coastal track as far as Vaṅḡolu, then by way of Rāmāyapaṭṭanam, Allūru, Nellūru, Guḍūru, Nāyudipēṭa and Sūlūru arrived in the proximity of Madrās. Rennell, in his *Road Book* (stages identified by U. Masson, *Means of Transport*, 38), mentions a route from Guṇṭūru to Madrās via Inkollu which, from Vaṅḡolu onwards, corresponds to Duperron's. Tavernier's course (1652) (*Travels*, vol. I, 207-15) between Bejavāḍa and Nellūru, passed to the east of the present road, via Koṇḍaviḍu, Addaṅki and Kandukūru.

14. The route followed by Abbé Carré (*Travels*, vol. II, 353-77) in 1673 corresponds to that indicated on the maps of Orme (*Military Transactions*, vol. III, *map of Coromandel*) and of Rennell (*map of Hindoostan*, 1792), of which only the chief stages could be identified: Ḥaidarābād, Malkāpuram, Cintalapālemu, Mācerla, Vinukonda, Vaṅḡolu. Malavois, coming in 1783 from Maratha country, mentions two ways which we here follow as of the area where they join the route from Karnūlu to Ḥaidarābād (of which we shall speak *infra*); the first led from Vanaparti to Rāmāyapaṭṭanam by way of Nāgar Karnūlu, Candampēṭa, Ēlēśvaram (Yel-laisaram) where the crossing of the Kṛṣṇā was made, Mācerla, Nekarikallu, Guṇṭūru; the second, 'more beautiful, shorter and more certain', linked Farrukhnagar (south-west of Ḥaidarābād) with Vaṅḡolu via Nārāyaṇapuram, Nalgonḍa, Miriyālgūḍa, Vazirābād, where the Kṛṣṇā was traversed, Dācēpalle, Nekarikallu, Kommālapāḍu and Addaṅki (*Voyage du S. Malavois*, table of itinerary, ms. of the *Bibliothèque de Versailles*).

15. Tavernier (*Travels*, vol. I, 236-8) states that he encountered in 1652 a group of 4,000 pilgrims coming from Burhānpur and transporting their idols in palanquins to Tirupati. The route taken by the French traveller (*ibid.*, vol. I, 216-27) from Madrās to Kaḍapa is difficult to identify, but it seems to correspond to that mentioned by Rennell in his *Road Book* (stages identified by U. Masson, *Means of Transport*, 41-2), except along the first segment. Tavernier followed a passageway serving Cōlavaram and Nārāyaṇavaram as far as Rēṇiḡuṇṭa (which, with Tirupati, commands the entrance to the Kaḍapa basins). The *Road Book* gives an itinerary passing through Pūntamalli (Poonamalli), Tiruvallūr, Nagaṛi and Puttūr. From there, the route roughly followed the course of the present-day railway line via Kōḍūru, Nandalūru and Kaḍapa. From Kaḍapa to Ḥaidarābād the *Road Book* indicates a course by way of Cennūru, Duvvūru, CāgalamaRRi, Nandyāla, Karnūlu,

the upper course of the Gundlakamma and passing through the depression separating Nallamala and Veligonda Ranges, to connect Mācerla and Kaḍapa.¹⁶

As to the remainder of the peninsula, the greater part of our knowledge is drawn from the maps by Orme and Rennell, who in the main have noted the movements undertaken by the armies during the Franco-English war and the Maisūru campaign, as well as from information provided in the engineers' reports pertaining to the regions annexed by the *East India Company*.

The West Coast Zone South of Govā

On the western coast, the numerous rivers descending the Ghāṭs, navigable along their lower courses, have in conjunction with the lagoons extending to the south of Ponnāni, ensured basic communications. For this reason, there was no veritable land route until the second half of the eighteenth century.¹⁷

Only those routes in Kēraḷa are remembered which existed after the campaigns of Ṭīpū Sultān,¹⁸ who cleared the Pēriyā, Tāmaraśṣēri and Kārkkūr passes,¹⁹ developed two routes proceeding from Farrukhābād, the provincial capital he had founded very near to KōLikōṭu (Calicut), to Kōyamuttūr (Coimbatore),²⁰ and opened the coastal route from

Vanaparti and Farrukhnagar. Heyne (*Tracts*, 461 sq.), who in 1809 went from Kaḍapa to Haidarābād, took this route but made a detour to the east to traverse the Kṣṇā a short distance downstream from its confluence with the Tuṅgabhadra.

16. Via Kambhamu. This route was taken by Tavernier in 1652 (*Travels*, vol. I, 235-41).

17. Concerning the ancient tracks of Kēraḷa, vide Kunhan Raja, 'Some Sandeśa Kāvyaś and Malabar Geography', in *B.C. Law Volume*, part I, 293-307. Pietro della Valle (*Travels*, 202-44, 290-7) made in 1623 the journey from Honāvar to Ikkēri (today a village without significance on the top of the Ghāṭs in the district of Sivamoggā), but from the sea to the foot of the mountains, he went up river by *mancina* (boat)! Tavernier (*Travels*, vol. I, 194-203) mentions a route from Kocci to Madrás, traversing the forest of the Ghāṭs near the sources of the PeriyāRu and passing through Maturai or Tiruccirāppalli.

18. We utilize here the reports of Colonel Dow and Captain Johnson concerning the condition of the roads in 1796, as well as the information provided during the same period by a noted inhabitant of the region, which were reproduced by Logan in his book on Malabar (*M.D.M., Malabar*, vol. I, 62-4).

19. From Mount Ēli, Kaṇṇūr (Cannanore) or from Talaśṣēri (Tellichery) the tracks were oriented to the Pēriyā pass; four ways terminated in Tāmaraśṣēri: two coming from the MalappuRam and two from KōLikōṭu (Calicut); the route from Farrukhābād to Gejalhaṭṭi via Nilambūr passed through the Kārkkūr Pass.

20. The road passed through Tirūraṇṇāṭi and Veṅkaṭakōṭṭa or Kōttakal (where it divided into two branches to then arrive at Kōyamuttūr (Coimbatore), the one passing through AnṇāṭippuRam, Maṇṇārakkāṭu and the Aṭṭappāṭi valley, the

Bēppūr to Koṭuññallur (Cranganore).²¹ During the same period, in Travancore, a road linking KaNNiyākumari to Koṭuññallur was to be built by a Hindu prince.²²

The conditions on the Maisūru plateau were more favourable to land transport and communications.

Maisūru

Rennell's map of 1792²³ indicates in summary fashion the major routes which diverged from Śrīraṅgapaṭṭaṇa towards the Ghāṭs rising to the west; then, northwards to the Rāyčūru *doāb*, ancient march disputed by the Deccan sultans and the Vijayanagara kings; and finally, the route which led to the Tamil plain in the south-east. The tracks on the eastern border of the plateau, dissected by the PālāRu, PeṇṇaiyāRu and Kāvēri rivers, are better known, for they played a significant role in the military operations relating to the Maisūru wars.

The tāluk of Hosūru was of particular importance, as it was there that the main roads passed which led to the plain by way of the Būdīkōṭe, Sūlagiri, Pālakkāṭu and Añcatti passes. Haidar and Ṭīpū generally followed routes extending along the PeṇṇaiyāRu or the Kāvēri.²⁴ The English directed their efforts to the PālāRu, which by reason of its proximity to Madrās was of greater importance to them; thus also explaining Clive's vigorous defense of Ārkāṭu (Arcot) and of Vēlūr in 1780-82, and the determination of the course of the present-day road from Madrās to Beṅgalūru. Also important was the road that, in the west, linked Śrīraṅgapaṭṭaṇa to the upper Kāvēri via Gejalhaṭṭi.²⁵

The Tamil Country

There remains Tamil country, which is prolifically described in the European documents of the second half of the eighteenth century. Its

other traversing Paṭṭāmbi and the Pālakkāṭu (Palghāt) Gap.

21. Via Tāpūr, Ponnāni and Veljiyāñkōṭu.

22. The prince to whom we refer was Rāma Varma (1758-98) (Bartolomeo, *Voyage*, 176). Lieutenants Ward and Conner mention in their *Memoirs of Survey* a route from PaNakkuṭi to Tiruvananthapuram (Trivandrum) via the ĀruvāmoLi Pass, continuing as far as Kocci, and a transversal route from Kollam to Ceñkōṭṭai (vide *M.D.M., Travancore State*, vol. III, 217-20).

23. Vide *Memoir of a Map of Hindoostan*, 1792.

24. *M.D.G., Salem* (Richards), vol. I, part I, 294; part II, 108-10.

25. The road can be traced from Gejalhaṭṭi almost to Haradanhaḷḷi; there are stretches still well preserved and marked by fine avenues (vide our article mentioned *supra* in n.4; *B.E.F.E.O.*, t. LXXVIII, 1991, 59-61 and photographs 12-26).

road network is quite well represented on the maps of Orme²⁶ and Rennell,²⁷ who collocated the geographic knowledge of the period

There was then, between Lake PaLavēRkāṭu and KaNNiyākumari or Rāmēśvaram, a network of longitudinal routes which met at recognized points, as for example, Śrīraṅkam-Tiruccirāpaḷli and Maturai.²⁸ From west to east and extending to the eastern coast from the Pālākāṭu Gap, another network developed, comprising two principal axes: one leading to Cēlam and the lower valley of the PeṇṇaiyāRu; the other which followed the Kāvēri by way of Tañcāvūr as far as the delta ports.

These main routes, along with the ramifications connecting them,²⁹ formed the meshes of a network corresponding to the ancient road links,³⁰ and which only differs from the present road system along short segments. This fact implies a certain degree of urban equilibrium.

The striking stability across the centuries of the land ways in Tamil country is contingent upon the constancy of the cities. The progressive concentration during the eighteenth century of activities around Madrás, the colonial capital,³¹ has altered only little the relative importance of the communication axes, because the centres of Tamil civilization were able to retain a noteworthy vitality. Certainly, the political history there, as elsewhere in the Deccan, was very agitated and a number of royal residences and fortresses came to be and then disappeared with the dynasties which had created them. However, the great religious cities, which were also administrative and commercial centres, have defied time.³² They were very little affected by the

26. The map of the Coromandel Coast (Orme, *History*, vol. III) notes many tracks between Tiruccirāpaḷli and Madrás which could not be indicated on the small-scale map we have drawn.

27. Rennell, *Memoir*, 1792.

28. The coastal road linking the ports of the littoral was the most direct pilgrimage route and the most travelled to Rāmēśvaram (vide F. Martin, *Mémoires*, t. II, 226-30; Valentia, *Voyages*, vol. I, 338-73).

29. The bases of this network (Kāñcipuram, Tiruccirāpaḷli, Tañcāvūr, Maturai) were of great strategic importance in the eighteenth century, for which reason opposing armies in the Franco-English war continually undertook to seize them, or at the least, to have control of their access.

30. Vide our *Recherches*, 15-16 and pl. IV, figs. 1 and 2.

31. It is known that there is no site on the East coast distinctly favourable to the establishment of a great harbour (development of the Madrás port dates only from 1871). If Putuccēri (Pondicherry) remained but a small city while Madrás came to be the Southern capital, then history alone is responsible.

32. Kāñcipuram, Buddhist centre from the fifth century B.C., then heart of the Pallava realm from the sixth to the ninth centuries of the Christian era, at all times famous for its arts and crafts; Tiruccirāpaḷli and its fortified rock, 3 km south of the sacred city Śrīraṅkam, celebrated pilgrimage site on the Kāvēri; Tañcāvūr, CōLa capital from the tenth to fourteenth centuries, annexed by Vijayanagara, then centre of a Maratha dynasty down to the eighteenth century, located at the head of the delta and considered as the garden of the South; Maturai, capital of the Pāṇḍya

Muslim destruction, which is perhaps one of the reasons why they have continued to exercise an attraction. Be that as it may, no other region of the Deccan has known such a permanence respective of its road network.

realm from the third century B.C. to the tenth century A.D. which under the *Nāyak* (sixteenth to eighteenth centuries) knew a very brilliant period, as testifies the great *Minakṣī* temple: so many permanent nodal points which have determined the communication lines. And the other holy places must be added, such as *Tiruvannāmalai*, *Maturāntakam*, without forgetting those at the extremity of the peninsula, *KaNNiyākumari* and *Rāmēśvaram*, prominent precincts of India's religious geography.

8. Ancient Goṇḍvānā

We have reserved for the last a zone which seems to have existed in isolation from the remainder of the peninsula: the ancient Goṇḍvānā which corresponded to the British *Central Provinces*, extending roughly from Bhopāl in the west to Sambalpur in the east, and from Bundelkhaṇḍ in the north to the Godāvarī in the south. This very wooded region, where primitive populations have found refuge and very old modes of life have been maintained, would appear to have been on the margin of the general lines of communication, excepting on its western border which was progressively cleared by Hindu cultivators and which served as frontier region for the empires of the plain. The great currents of men and merchandise manifestly circumvented the region. Prior to the second half of the nineteenth century there existed no meridional artery from the mid-valley of the Gaṅgā to the Godāvarī, nor a transversal axis following the natural corridor which stretches from Khāndeś to Oṛīsā.¹

Nonetheless, the isolation of Central India does not imply that there had not been interrelation and exchange, for since most remote times men have ventured into its wooded massifs. Ancient literary texts as well as archaeological studies testify to the religious vitality of this region throughout which are scattered *tīrtha*, holy places which have always attracted ascetics and pilgrims.²

1. At the outset of British occupation, a great extent of the country was without roadways. The route from Hazārībāgh to Nāgpur was so little known that Garden (in *Table of Routes*, 200) gives no description whatsoever and contents himself to indicate the distances between the different stages (Thornton, *G.T.E.I.C.* (1854), vol. II, 335-6). One of the most important events in the history of the *Central Provinces* was the establishment of a railway connection in 1867 between Jabalpur and Kalikātā on the one hand, and between Nāgpur and Mumbai on the other (*I.G.* (1908), vol. X, 55). The main roads which today cross at Nāgpur are thus of recent development.

2. Indeed, innumerable are the sanctuaries bathed by the rivers or set high on the rocky spurs which throughout the ages have been meeting points for sages in search of solitude or of pious Hindus. The Narmadā, in particular, rivals the Gaṅgā in sacredness and its source at Amarkaṇṭak is a pilgrimage centre (from this same plateau diverge also the Son and the Mahānadi): each year hundreds of devout Hindus walked along the river, from its mouth to its source, and returned by following the opposite bank (Eyre Chatterton, *The Story of Gondwana*, 5-9). The antiquity of travel is borne witness by the *Rāmāyaṇa*, in which is related how Rāma traversed the Daṇḍaka forest to proceed from Prayāga to the Godāvarī; he could have crossed the Narmadā somewhere between Sohāgpur and Narasimhapur (vide

The Old Pilgrimage Routes

The study of the distribution of ancient monuments³ shows that a series of tracks connected the sacred cities of the Gangetic valley to the great pilgrimage centres of the Narmadā and the Mahānadī by way of the passes in the Kaimūr Range.⁴ To the west, the Badanpur Pass allowed of communication between the mid-Gaṅgā and the Veṅgaṅgā valley by means of the Jabalpur depression.⁵ At Gaddīghāt in the mid-region, a track passed from Prayāga to Amarkaṇṭak⁶ which was linked by a ramification to the pilgrimage route from Kāśī to Oṛiśā traversing Śilpīghāt and reaching the upper Mahānadī at Sevarīnārāyaṇa.⁷

From west to east, very old contacts seem to have existed between Barār (and even Khāndeś or Mālava) and the Oṛiśā coast.⁸ Archaeo-

F.E. Pargitter, 'The Geography of Rama's Exile', *J.R.A.S.*, 1894, 245-50).

3. These monuments are not distributed in an arbitrary fashion, but correspond to an organized network of tracks. Beglar, who made numerous journeys through Central India, considered that by connecting the most important archaeological vestiges, one could determine the probable course of the ancient roadways (*C.S.R.*, vol. VII, 140; vol. XIII, 12).

4. As for meridional communication lines, the Kaimūr Range represented a barrier and its passes were passages obligés (vide Beglar's remarks in *C.S.R.*, vol. XIII, 12-15).

5. The tracks from Prayāga and from Kāśī probably joined shortly before Badanpur; from there it was possible to reach Tripura (or Tevar, 9 km west of Jabalpur) or Bherāghāt, very near the Narmadā, and to continue on to Rāmtek, another place of pilgrimage in the Nāgpur district (vide *C.S.R.*, vol. XIII, 12-13; vol. IX, 54-60). The abundance of ancient remains found in Karītalāī, Bijeraḡhogarh, Tīgovā, Bahurībānd and Rūpnāth (where an Aśokan rock inscription was found) (vide *C.S.R.*, vol. IX, 38-41) allows of the supposition that these settlements were located along this route. It is furthermore probable that in this region, at least during the *Mauṛya* era, a ramification existed which joined the old route from the Gulf of Khambhāt (vide *supra*, 47-48). To the south of the Kaimūr Range a branch road proceeded to the Mahānadī by way of Bāndhogarh, Pālī and Sohāgpur (*C.S.R.*, vol. XIII, 12).

6. A track can be distinguished in relation to the distribution of ancient monuments which, setting out from Prayāga, traversed Gaddīghāt and divided into two branches at Majholī: the one leading to Sohāgpur and Amarkaṇṭak, the other bifurcating eastwards to Mārā where it met the track from Śilpīghāt (*C.S.R.*, vol. XIII, 14-5). Beglar (*ibid.*) mentions that this was still at his time (1874) a very frequented pilgrimage route.

7. According to Beglar (*C.S.R.*, vol. XIII, 16), this route, which led from Kāśī to Sevarīnārāyaṇa through Rājgarh, Saipur, Sonhāt, Pālī and Jānjgir, played as important a role as did the preceding.

8. An Aśokan edict at Dhauḷī gives to understand that occasional journeys were undertaken between Ujjayinī and Tosālī. The discovery of coins at Sonpur would seem to indicate that this city was located on a communication line. In 1421, Hoṣaṅg Śāh went from Māṇḍu to Kaṭak in the guise of a horse merchant (P. Acharya, 'Ancient Routes of Orissa', *O.H.R.J.*, vol. IV, 1955, 49).

logical studies suggest the existence of a route setting out from Bhāṇḍak and continuing to the Mahānadi, where it divided into two branches, one leading to Sevarinārāyaṇa and to Jagannātha-Purī, while the other proceeded to Gañjām.⁹

The liaison between the northern pilgrimage routes and those from the south was probably effectuated in the region of Bhāṇḍak. It was there that the route from Orugallu (Varaṅgal) merged, at which point the network of 'Dravidian' tracks terminated,¹⁰ thus enabling an important religious traffic between Rāmēśvaram and Kāśī. However, because of lack of documentation, one can but advance hypotheses concerning the courses of these communication lines.

Other than pilgrimages, it seems that the transport of salt from the east coast to the interior of the plateau constituted traffic of a considerable amplitude.¹¹ But the urban and economic life of this central zone would not appear to have been sufficiently developed to have given rise to such economic and cultural currents as comparable to those which traversed the surrounding provinces. During the Mughal period, the imperial government never succeeded in controlling the jungle kingdoms.¹² It was the Marathas, who setting out from Nāgpur,

9. Beglar, after having visited the archaeological sites located in the transversal corridor, assumed that this old route traversed Devatek, Hāt-Baṇjārī, Ambāgarh Cauki, Bāloḍa, to then divide, on the one hand proceeding to Purī via Dhamtarī, Sirpur, Sevarinārāyaṇa, and on the other to Gañjām by way of Kāṅker (*C.S.R.*, vol. VIII, 140).

10. In a grammatical treatise dating from the thirteenth century (*Āndhra Bhāṣābhūṣaṇam*), the Telugu poet Kētana mentions a route which led from Kāñcipuram to Ayodhyā via Nellūru and Orugallu (Varaṅgal), and which was perhaps the route most travelled by pilgrims going to the temples in the Gaṅgā vallēy (A. Vaidehi Krishnamoorthy, *Social and Economic Conditions in Eastern Deccan*, 98). In *Lettres édifiantes* (t. XIII, 97), Father Bouchet transmits information given to him by pilgrims on their way to Rāmēśvaram and Kāśī: 'Those who go by way of Golconde say that leaving Bagnagar (Haidarābād) it is necessary to proceed slightly eastwards, whence they continue directly to their destination'. This corresponds to the route which we have delineated.

11. A large amount of the salt production of the east coast was exported inland by the Baṇjārā caravans. A secular traffic of which the volume is unknown, but which judging from later documentation must have been high. During the eighteenth century an enormous quantity of salt was transported each year to Barār: 3 lākh of man (B.C. Ray, *Orissa*, 78-83).

12. The northern half of the country was in the sixteenth century subject to the rājā of Gaṛhā, but Akbar dismembered the kingdom and sacked the capital. The upsurge of resistance spread to the Goṇḍ at Devagarh in the centre of the country, while in the south a third dynasty reigned at Cāndā. Their treasures attracted the Mughal greed, and in the course of the seventeenth century they launched against them several expeditions, the destructive effects of which were but temporary as, distant from their bases and cut off by the jungles from large supply centres, the imperial armies had not the means to pacify these hostile regions.

where they had been firmly established since 1739, through their repeated offensives into the mid-Gaṅgā region and Baṅgāl opened the country to general traffic. Thus, it was in that city, the geographical centre of India, that the majority of the ways which prefigured the present-day roads were to terminate.¹³

Nāgpur, Centre of Divergent Routes under the Marathas

The lines of communication with the best defined courses were those in the western section which tied-up with the major imperial highways.

From the Gaṅgā valley (Ilāhābād or Banāras) to Nāgpur, the old route has not greatly changed; but along several segments it had passed some kilometres to the west of the present-day road.¹⁴ In the direction of Mālava or of Khāndeś a number of roads linked up with the western Mughal network. That which went to Hoṣaṅgābād has not changed.¹⁵ Of two others which led to Burhānpur, one followed along the southern border of the Gāvilgaṛh Mountains via Elicpur,¹⁶ while the second passed through the middle of the Pūrṇā basin via Amarāvati and Bālāpur,¹⁷ whence it was possible to reach Auraṅgā-

13. Vide Rennell's large map of India, as well as the small map entitled: *additions to the Berar* in his *Memoir* (1792).

14. Major stages: Rivā, Amarpāṭan, Badanpur, Bañjārī, Bilharī, Sihaurā, Gosālpur, Gaṛhā, Jabalpur, Dhūmā, Lakhnāḍon, Chapārā, Caunrī, Ḍongartāl. At Corbāvalī, 45 km from Nāgpur, the road divided into two branches, one passing through Rāmṭek, the other via Soṅghāt, and met again at Kherdī, whence a single track led to Kāmthī. There, once again, it formed two ramifications; the first, following what is the present-day road, led to Sitābaldī, the second led from Kāmthī Sarāe to the centre of Nāgpur, which was the route followed by Dangereux in 1759 (Law de Lauriston, *Mémoire*, 535) and by H. Colebrooke in 1799 ('A Narrative of a Journey from Mirzapur to Nagpur', *Asiatic Annual Register for the Year 1806, Miscellaneous Tracts*, 27-43). The ramifications of the old route in the Nāgpur district are mentioned in the *Gazetteer of the Central Provinces* (1870), 335.

15. Stages: Nāgpur, Sāvaner, Cicolī, Pāndhurnā, Tīgāmv, Multāī, Baitūl, Śāhpur, Caukīpura, Hoṣaṅgābād (Rennell's map of 1792, as well as his *Road Book*: route from Siroṅj to Haidarābād via Hoṣaṅgābād and Nāgpur, noted by U. Masson, *Means of Transport*, 27). According to the *Gazetteer of the Central Provinces* (1870, 51-2), it was lined with *sarāe*.

16. Stages according to Rennell's map: Bāzārgāv, Koṇḍhālī, Kārañjā, Āṣṭī, Ner Pīnglāī, Elicpur, Akoṭ, Sonālā, Jalgāmv, Zainābād, Burhānpur.

17. It left the preceding west of Kārañjā and traversed Tivsā, Nāndgāv, Amarāvati, Murtazāpur, Kurāṅkheḍa, Akolā, Bālāpur, Nāndura, Malkāpur, Edalābād, Burhānpur. Concerning this route, between Amarāvati and Burhānpur, only insufficient information was available to Rennell, which he incorrectly interpreted. He only indicates a simple line (with but two stages: Edalābād and Nāndurā) which passes just north of the route from Amarāvati to Auraṅgābād. A study of the map shows that Nāndurā would have to have been linked with Bālāpur, and that as far as Amarāvati there had probably been only one route.

bād via Jāfarābād or Jālnā.¹⁸

Three routes were oriented southwards. The first traversed the district of Vardhā and entered in the region of Nāndeḍ into the main transversal route from Surat to Macilipattānamu.¹⁹ The second cut directly southwards as far as the Peṅgaṅgā, then from 'Ādilābād to Ḥaidarābād followed what is now the course of the present route.²⁰ The third, which served Cāndā, passed well to the west of the actual course or of the railway line.²¹

From Nāgpur to Chattīsgarh, in the central corridor, land communication vascillated among several tracks: one which proceeded along the plateau, to the north, and led to Ratanpur via Khairāgarh; the second, in the mid-region, following the same course as the present route, went to Rāypur via Bhaṇḍārā and Durga; finally, another to the south and more difficult, crossed the undulating area of Cicgaḍ.²²

In the Mahānadī valley²³ the passageways from Rāypur and Ratan-

18. The track divided into two branches at Lākhanyāḍā which led to Aurāṅgābād, one by way of Jāfarābād and Dābhāḍī, the other via Deūlgāv Rājā and Jālnā.

19. The itinerary as given by Rennell seems to correspond to that followed by Dangereux in 1759 (Law de Lauriston, *Mémoire*, 535). The stages thereof from Nāgpur to Māhor are easily followed: Kānholī, Sailū, Nācaṅgāv, Bhām, Ārṇī. Setting out from Māhor, one branch led to Nāndeḍ, while another went to Karkhelī (which Dangereux followed). Unfortunately, we have not been able to identify the intermediary stopping places.

20. It went through Giraḍ, Varorā, Kāyar, 'Ādilābād, Nērēḍikoṇḍa, Nirmal, Bālkoṇḍa, Ārmūru, Indālvaī, Kāmāreḍḍī, Masāyipeṭa, Ḥaidarābād.

21. Stages: Nāgpur, Umreḍ, Cīmūr, Khatorā, Cāndā, Virur, Vaṅkiḍī (Vākḍī), Tāṇḍūru, Dharmapuri, Jagatyāla, Elgaṇḍal, Siddipēṭa, Ḥaidarābād.

22. Rennell's indications regarding this zone are very confused. On his map *additions to the Berar*, he incorrectly employs the information gleaned respective of the two routes connecting Nāgpur and Khairāgarh, and probably reversed the order of their courses. For the northern route we follow the map of 1792 which indicates the following halting points: Nāgpur, Kāmthī, Mohāḍī, Tumsar, Tiroḍā, Kāmthā, Lāñjī, Khairāgarh, from whence two branches led to Ratanpur, the one passing through Devkar and Takhatpur, the other proceeding by way of Dhamdā, Simgā and Tareṅgā. The central route between Nāgpur and Khairāgarh is not mentioned by Rennell. H. Colebrooke (*Asiatic Annual Register 1806, Misc. Tracts*, 17 sq.), who travelled that way in 1798, gives the following stopping places: Nāgpur, Bhaṇḍārā, Lākhni, Sondad, Belgām, Khairāgarh. Rennell nonetheless indicates the route from Doṅgargarh which led to Rāypur via Durga, and the branch from Rāypur to Tareṅgā. There remains the southern route, whose course is but speculative, obtained by arranging the places named on the map: *additions to the Berar*. It traversed the Veṅgaṅgā probably in the region of Bhaṇḍārā ('Bunderu' on the map), or perhaps somewhat farther to the south at Paunī ('Poonee'), and joined the former after having gone through Cicgaḍ ('Cheezgur') and Hāṭ Bañjārī ('Bunjaree'). This interpretation is all the more plausible, as the *Gazetteer of the Central Provinces* (157) considered this track to be one of the three most important ancient routes from Nāgpur to Chattīsgarh.

23. Further to Rennell's maps, vide Thomas Motte, 'A Narrative of a Journey

pur which led to the Orīṣā coast and to Jagannātha-Purī joined at the two large bends formed by the river, at Sambalpur and Sonpur, whence in very near proximity the waterway (navigable downstream throughout the year) was followed as far as the delta.²⁴ The present trunk road from Sambalpur to Kaṭak avoids its banks exposed to floods and, more directly, crosses the plateau to the north.²⁵

On either side of the central corridor little-known tracks led to the northern plains and the east coast.

Crossing the Maikala Range and the desert and wild plateau dissected by the Narmadā and its affluents, a narrow track edged its way leading to Maṇḍlā, from where several ramifications went on to enter the meridional route (from Rīvā to Nāgpur) at Gaṛhā or Jabalpur and in the vicinity of Sivanī.²⁶

Trails with changing courses proceeded to the Gaṅgā. There was

to the Diamond Mines at Sumbhulpur', *O.H.R.J.*, vol. I, 1952, app. II, 1-49; Leckie's 'Journal in Orissa of 1790', *O.H.R.J.*, vol. II, 1953, app. IV, 1-14; as well as B.C. Ray's study regarding the Nāgpur routes to Orīṣā under the Marathas (*Orissa*, 150-2).

24. The route from Ratanpur to Sambalpur passed through Jāñjgir, Sevarī-nārāyaṇa (where it crossed the Mahānadī), Bhaṭgāmv, Sāraṅgarh. At Bhaṭgāmv the road from Khairāgarh came to an end, and at Sāraṅgarh a branch set out which led to Sonpur. Rāypur was linked with Sambalpur by a track which probably followed the course of the present-day road through Araṅ and Bargaṛh, and was connected to Sonpur by a route taken in 1790 by Leckie (*O.H.R.J.*, vol. II, 1953, app. IV, 10-4) via Araṅ, Khalārī, Suarmār, Āgalpur, Salebhatta and Locipur. The usual way from Sambalpur to Baudh followed the left bank of the river through Sindole; there was also a more direct but difficult trail, 'almost impassable even for a palankeen', taken by Motte in 1766 (*O.H.R.J.*, vol. I, 1952, app. II, 30 sq.) which, via Mānesar and Jujumārā, connected to the two ends of the large bend. Downstream from Baudh the route did not stray from the right bank until Kaṭak, passing through Rāmgāṛh, Kusumgarh, Baramul, Kaṇṭilo and Padmābatī (Motte, *op. cit.*, 19-29; Leckie, *op. cit.*, 5-10).

25. Via Rāyṛākhōl, Haṇḍapā, Aṅgul and Dhenkānāl.

26. Stages according to Rennell's map (*Memoir*, 1792): Ratanpur, Paṇḍariyā, Borlā, Bichiyā, Maṇḍlā, Dithorī, Kānīvārā, Sivanī (Seoni); the stages from Maṇḍlā to Jabalpur could not be identified. Speaking of the projected road-construction from the Chattisgarh plain to Jabalpur, the author of the *Gazetteer of the Central Provinces* (1870, 82-3) states: 'at present the line followed by the Banjaras resembles the Northern routes - a circuitous track over hills and valleys intersected by numerous streams, the rocky beds of which present most formidable obstacles. This hilly and difficult country extends over a distance of about one hundred miles'. He adds (*ibid.*, 268-9), recalling the communication lines in the Maṇḍlā district: 'on coming into the district from the Westwards, the wilderness of the country and its jungle aspect is striking; the hills are blue, wild, covered with dense shrub jungle and apparently deserted; through these are nothing but narrow footpaths, touched on either side by jungle and long grass; and stories of deaths from starvation, tigers or thirst are numerous'.

one which passed through the region of Amarkaṇṭak and arrived at Rīvā after having crossed the Kaimur Range.²⁷ The other which went to Mīrzāpur and Banāras across the butt and isolated rocks of the Sargujā seems to have been oft-frequented by the pilgrims from Hindusthān journeying to Jagannātha-Purī, as well as by those from the South making their way to Banāras.²⁸ From the direction of Bihār and Baṅgāl, tracks traversed the jungles of Choṭa Nāgpur. Occasionally travelled by Maratha horsemen, they do not seem to have been sufficiently stable to have allowed of regular communication with the towns in the lower valley of the Gaṅgā.²⁹

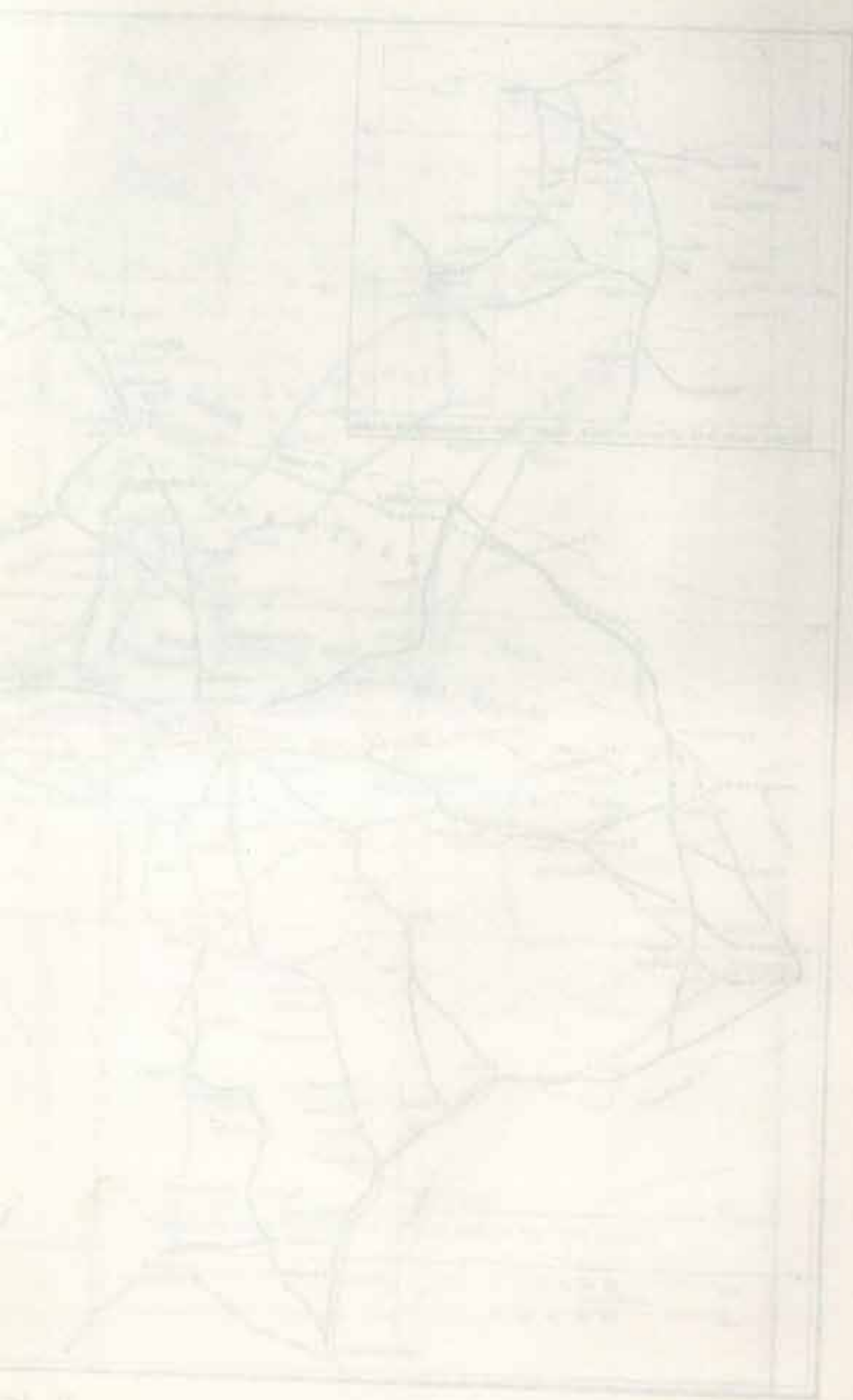
On the other hand, the transitways extending in the direction of the east coast, towards Gañjām and Śrīkākuḷamu, played a vital role, as they provided Central India with salt. Unfortunately, we remain unaware of their courses.³⁰

27. From Ratanpur to Amarkaṇṭak it passed through Kendā and Pendrā, as specified by Blunt (*Asiatic Researches*, vol. VII, 100), who in 1795 procured information from Brahmans in Ratanpur: 'They said there was but one (road) which led into the hills, on the sides of precipices through a forest almost impenetrable to Pindara. From this place the road was only known to the mountaineers who are always taken as guides to direct the pilgrims in ascending the table of Omercuntunc'. From Amarkaṇṭak to Rīvā the stages according to Rennell were: Sīnghpur, Sohāgpur, Karvā, Kanaudī, Citrāṃv, Marvās and Corhāt.

28. Rennell indicates but a short segment of this route: from Mīrzāpur to Saipur via Śīlpighāt. Blunt (*Asiatic Researches*, vol. VIII, 57-97) crossed at this pass in 1795, and after having gone through Saipur, Mārā, Sonhāt and Mātin, arrived in Ratanpur. H. Colebrooke (*Asiatic Annual Register*, 1806, *Misc. Tracts*, 1-22) passed in 1798 somewhat farther east by way of Agorī, Koṭā, Dūdhi, Hariharpur, Sargujā, Rāmgarh, Curī and Ratanpur. He states that he encountered numerous groups of pilgrims coming from Maratha country (Pune, Nāgpur) and heading for Banāras by means of this long and difficult track, because it was more certain than the route from Jabalpur. Regarding the condition of these two routes in the second half of the nineteenth century, the author of the *Gazetteer of the Central Provinces* (82) gives information which requires no commentary: 'Both these routes are, through a great portion of their length, simply tracks across the hills and through the jungles, along which few traders or travellers would venture alone. They proceed through so difficult a country and extend over so great a distance that there seems little prospect of much ever being done to open communications in this quarter'.

29. One can scarcely follow those indicated by Rennell, failing to be able to identify the majority of the stages. Because of the density of the forests and the hostility of its primitive populations, the Choṭa Nāgpur still represented a barrier at the close of the eighteenth century. The English *Company*, which would very much have wished to establish more rapid postal lines between Kalikātā and the capital of Barār across the Mayūrbhañj and had requested the opinion of the *rājā* of Nāgpur, received a discouraging response and the postal route continued to pass through Kaṭak, though the distance was considerably greater (*C.P.C.*, vol. V, No. 1398, cited by Ray, *Orissa*, 151-2).

30. Rennell indicates a ramification setting out from Gañjām which continued



In conclusion, even though religious traffic would seem to have been of very ancient date in the Goṇḍvānā (where sanctuaries having local or more far-reaching influence were abundant), and although the transportation of salt from the east coast to Barār would have been effectuated since time immemorial, the integration of the tracks of this zone into the ensemble of the road networks sustaining the general land communication in India is of recent occurrence.

on, via Ghumsarā, to join the Kaṭak route to Central India. There was also indubitably the track which in the nineteenth century linked this port to Rāypur through the region of Khariyār and over which a large amount of salt was conveyed to Chattisgarh, even though it was 'one of the wildest and most unhealthy routes in India' (*Gazetteer of the Central Provinces*, 158). The other way leading from Śrīkākuḷamu and Sālūrugḥāt to Nāgpur, indicated by Rennell on his map of Central India (*additions to the Berar*) with a simple line, probably corresponded to that which the *Bañjārā* followed through Jaypur. In 1795, the *rājā* of Kānker told Blunt (*Asiatic Researches*, vol. VII, 113-4) that there were then two major tracks from Chattisgarh to the *Sarkār* coast which joined in Jaypur; the one passing through Kānker, Jagdalpur and Koṭapād, the other through Sihāva and Rāygarh.

9. The Indian 'Z'

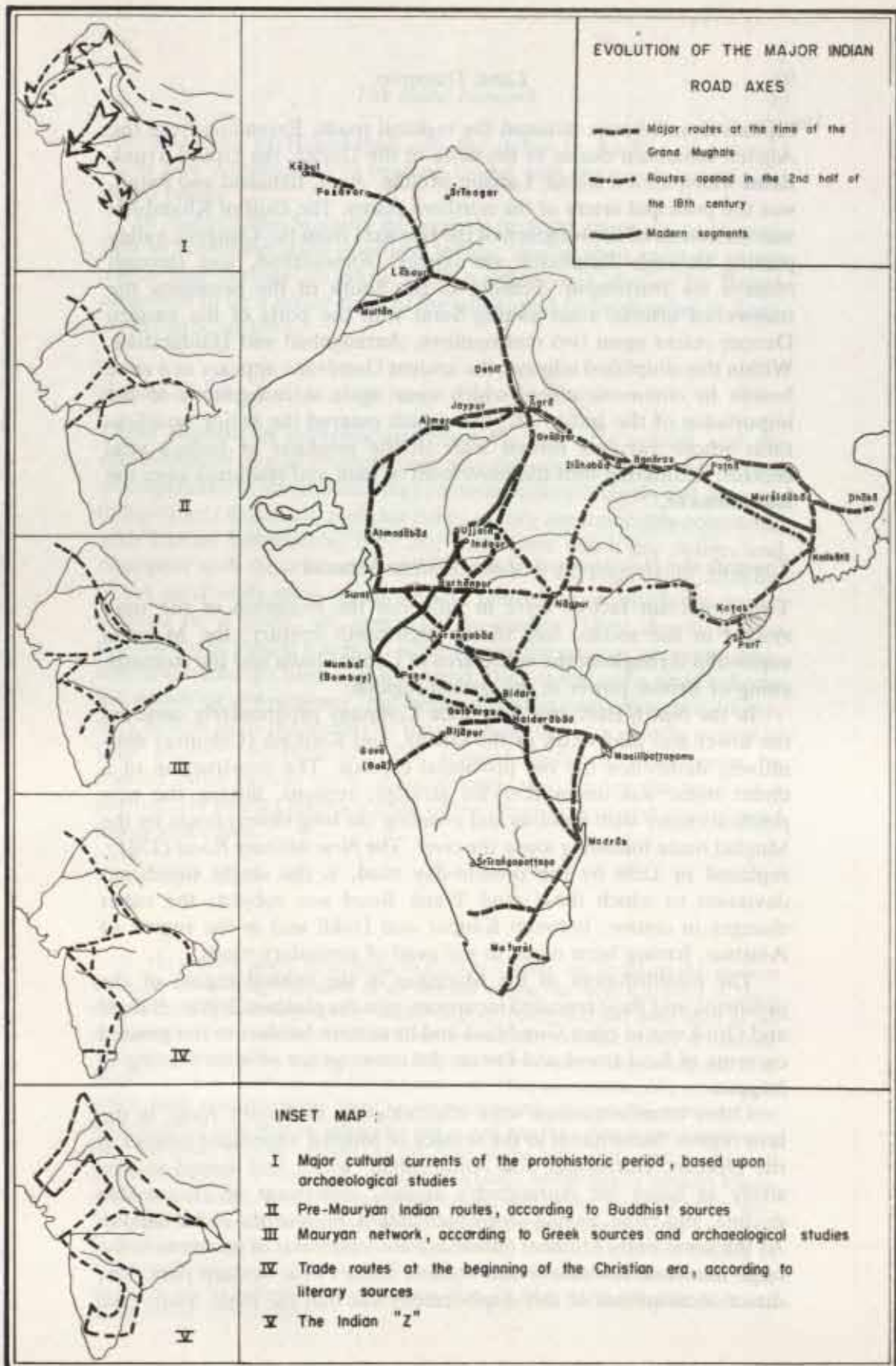
We have thus progressively gathered together the strands which represented the old roads and ways of India. They are of disparate nature and the plexus which they form are not all of the same quality. Nonetheless, they constitute a coherent ensemble reflecting the various aspects of the subcontinent's history.

The network seems to have been organized on the basis of very ancient and diffuse land travel, which before having answered to the requirements of the empires, was progressively adapted to regional needs. The courses of the main routes, having developed by a process of selection from among certain segments or through a joining thereof, and which have changed in accordance with the evolution of urban centres, are not easy to delineate because of the dearth of sources. However, if the principal currents of communication and transport which have animated the country from the protohistoric period to the Mughals (vide Fig. XIII)¹ are considered, it will be noticed that they all follow the same orientations and describe a large 'Z' across the peninsula. The lines thereof are very simple: the first, into which enters the Indus axis, emerges from the passes in the North-West and follows the Gaṅgā Valley to Baṅgāl; the second connects the northern plains to the Gulf of Khambhāt; the third curves diagonally across the Deccan to the Coromandel Coast; whence the last line proceeds to the Pālakkāṭu (Pālghāt) Gap and the western coast. These arteries, which over the centuries have served the movement of soldiers, merchants and pilgrims, have allowed of the diffusion of an original culture, and thus the permanence of the Indian 'Z' appears to us to represent a fundamental factor in the history of Indian civilization.

During the Mughal period the communication lines radiated from Āgrā to Dehlī and formed an enormous ramification which corresponded to the political, administrative and economic interests of a centralizing monarchy. Its largest strands interwove at the provincial

1. Archaeological studies show the major cultural currents of the protohistoric period; Buddhist sources indicate the initial axes of communication; the distribution of Aśokan edicts suggests the courses of the main routes of the *Maurya*; Greek and archaeological sources delineate the directions of exchange from the first centuries of the Christian era; Arabian and Persian authors mention the communication lines in the North-West during the Muslim period. This information has been collocated and mapped in our *Recherches*, 13-41 and pls. I-VII.

2. The image is from F.J. Richards, 'Geographical Factors in Indian Archaeology', *The Indian Antiquary*, vol. LXII, 1933, 235-43.



XIII. The Indian "Z".

capitals from whence radiated the regional roads. Extending from the Afghān mountain chains to the delta of the Gaṅgā, the Grand Trunk Road which served Kābul, Lāhaur, Multān, Āgrā, Ilāhābād and Paṭnā, was the principal artery of the northern plains. The Gulf of Khambhāt was the centre of convergence of the two axes from the Gangetic valley passing through Rājputānā via Ajmer, Aḥmadābād, and through Mālava via Burhānpur. Finally, in the South of the peninsula the transversal arterial road uniting Surat with the ports of the eastern Deccan relied upon two metropolises, Auranṅābād and Haidarābād. Within this simplified schema, the ancient Goṇḍvānā appears as a zone hostile to communications; which once again is recognition of the importance of the Indian 'Z', into which entered the major ramifications whose currents flowed with all the products of India's vital centres, facilitating thus the movement of men and resources over the subcontinent.

Towards the Development of the Modern Network

Two important factors were to influence the evolution of the road system in the second half of the eighteenth century: the Maratha expansion throughout the entire area of Central India and the strengthening of British power in the coastal regions.

In the North East, the *East India Company* progressively annexed the lower and mid-valley of the Gaṅgā, and Kalikātā (Calcutta) definitively dethroned the old provincial capitals. The construction of a direct route was undertaken for strategic reasons, linking the new political centre with Banāras and avoiding the long detour made by the Mughal route following along the river. The *New Military Road* (1781), replaced in 1838 by the present-day road, is the single significant deviation to which the Grand Trunk Road was subject; the other changes in course, between Kānpur and Dehlī and in the region of Amṛtsar, having been made to the avail of secondary roads.

The establishment of the Marathas in the central region of the peninsula and their repeated incursions into the plains of Bihār, Baṅgāl and Oṛisā was to open Goṇḍvānā and its eastern borders to the general currents of land travel and favour the convergence of ways leading to Nāgpur.

Other transformations were effectuated in the South-West, in the lava region. Subsequent to the setback of Mughal imperialist politics in the Deccan, Burhānpur and Auranṅābād, which had served successively as bases for Auranṅzeb's armies, underwent an irreversible decline, and Pune, having supplanted Sātārā, became the *Peśvā* capital. At the same time, Mumbai (Bombay) divested Surat of its status as the large maritime settlement and became India's new western port. The direct consequence of this displacement was that the main transversal

artery leading to Haidarābād and the deltas in Āndhra abandoned Surat and Aurangābād to become linked with the newly established nexus points.

In Mālava, the Maratha movements brought about the re-orientation of communication lines and Indaur, one of their military camps which had become an active road junction, was chosen by British engineers to be a major stage of the trunk road from Mumbai to Āgrā, constructed in 1840.

Routes and the Evolution of Towns

These changes in interrelation reflect the end of a system and the establishment of a new order. They also show (and, this we would wish to emphasize in conclusion) that communication lines do not have an independent existence, and that being as they are intimately connected with human settlements, they live with those which are active, and disappear with those which perish. And this is the underlying meaning of the small-scale maps which we have plotted, upon which the stages, marked by a point, are connected by dashes. They should not be considered as simple schemas: while tracing the courses of communication and exchange over a given period, they at the same time indicate the points of convergence, the nexus of traffic lines. Which is to say, they inform as to the vitality of the urban centres at a specific period in their history.³ Furthermore, this general synthesis, which must be studied more closely on a regional level, could form the basis of a particularly fruitful interpretation of the development and evolution of towns and cities.

3. How many times, attempting to identify a name not found on the modern maps, or discovering the name of an obscure village, we were surprised to learn that, according to inscriptions or archaeological findings, it had once been in the sometimes recent past a considerable settlement. An example taken at random: Tavernier, proceeding in 1652 to the Kaḍapa Valley, took when setting out from Madrās a route which served CōLavaram and Nārāyaṇavaramu, two settlements which were probably quite large in the seventeenth century, in particular the second, which had been an influential centre and was for a time a royal residence; they are today humble villages. At the close of the eighteenth century, Rennell indicates a different route from Madrās to Kaḍapa which passed through Pūntamallī (Poonamalli), whose fort played a certain role in the Franco-English war; Tiruppāsūr, a very ancient village which was still very active during the era of the European *companies*; and finally, Puttūr, located on the railway line leading to Tirupati (5 km west of Nārāyaṇavaramu), whose development is recent. This change in course is significant (vide *supra*, 77 n. 15; *M.G.*, 180, 698, 899; *M.D.M.*, *North Arcot*, 379-81, 383).

II

ROAD ENGINEERING AND WORKS PROVIDING AMENITIES TO WAYFARERS

In order to determine at this point the diversity of character of ancient roads, it will be appropriate to define the different classes of public highways which have channelled both general and local traffic. Our investigation concerns, on the one hand, the principles of road engineering and, on the other, the necessary prerequisites of inland travel, bridges over the water-courses, milestones at intervals, lines of trees affording shade, wells dug to supply water and halting-places providing shelter to wayfarers.

Theoretical Classification of Ancient Roads

India's ancient literature abounds in conventional classifications,¹ distinguishing among landroutes in accordance with various criteria; a fact which bears witness to the indisputable interest directed since an early date towards communications on the local level of village or city, but which also denotes on the part of Indian jurists and commentators an excessive propensity to artificial codification.² Let us nevertheless retain the distinction which has been drawn between an ordinary road (*mārga*) and the main road (*rājamārga*), as it is generally found in the inscriptions, which disclosing genuine and datable facts represent

1. Vide B. Srivastava's discussion of this question in *Trade and Commerce*, 309-13: App. C, 'Some conventional names of routes as known from literary sources'.

2. These texts do not appear to be directly concerned with routes: they pertain more to roads layed out within the limits of the settlements or in their immediate proximity, than to those linking urban areas to each other. It is noteworthy that in ancient as well as more recent treatises, the description of roads is included with that of towns. As a matter of interest, we reproduce below in tabular form the information provided in the *Arthasāstra*, the *Brahmāṇḍapurāṇa* and the *Sukranīti*.

Categories of Roadways

Width

- | | |
|---|------------|
| A. According to the <i>Arthasāstra</i> (2.4.1-5) | |
| a. royal roads (<i>rājamārga</i>) as well as those ways (<i>patha</i>) in the <i>dronamukha</i> , the <i>sthānīya</i> and the <i>rāstravivṛta</i> (?), and those located at ports, in bazaars (?), military camps, cremation grounds and villages | 32 cubits |
| b. carriageroads (?) (<i>rathya</i>) | 16 cubits |
| c. paths on dykes (<i>setu</i>) or through wooded areas (orchards) | 16 cubits |
| d. paths crossing elephant tracks (<i>hastikṣetra</i>) | 8 cubits |
| e. cart tracks | 5 cubits |
| f. cattle trails | 4 cubits |
| g. tracks for smaller livestock and pedestrians | 2 cubits |
| B. According to the <i>Brahmāṇḍapurāṇa</i>
(<i>anuṣaṅgapāda</i> , <i>adhyāya</i> 7, <i>śloka</i> s 112-114a) | |
| a. <i>diśāmārga</i> , roads leading in the four cardinal directions | 120 cubits |

authentic testimonies of the past.³ During the Mughal period a distinction was made between local or regional service roads and the imperial highways (*bādsāhī*), which we would term trunk roads.

The former for the greater part elude our investigation,⁴ but one can study those of the second category by searching the traces left by them, or through interrogation of the ancient texts. With the aid of these documents we shall first examine the problems involved with the construction and maintenance of roadways.

b.	<i>grāmamārga</i> , main roads of a settlement	80 cubits
c.	<i>sīmāmārga</i> , roads encircling (the settlement)	40 cubits
d.	<i>rājapatha</i> , roads leading to the palace (?)	40 cubits
e.	<i>sākhārathyā</i> , main branch roads	16 cubits
f.	<i>rathyā</i> , ordinary roads	3 cubits
g.	<i>uparathyā</i> , small roads	2 cubits
h.	<i>janghāpatha</i> , lanes	4 feet
i.	<i>grhāntara</i> , passageways	3 feet

C. According to the *Śukranīti* (I. 260-65)

a.	<i>rājamārga</i> , royal roads departing from the palace in the four cardinal directions	30, 20, 15 cubits
b.	<i>mārga</i> , roads appropriate to towns and villages	10 cubits
c.	<i>vīthi</i> , ordinary roads	5 cubits
d.	<i>padya</i> , pedestrian ways	3 cubits

(translation from Sanskrit and commentary by Bruno Dagens)

3. For example, in Tamil country under the *Cōla* one distinguished two classes of roads: the *peruvāli*, or main roads, and the *vati*, or local roads (Nilakanta Sastri, *Colas*, 1937, vol. II, part I, 417; Gros and Nagaswamy, *Uttaramēṛūr*, 93-4). And likewise during the Vijayanagara empire the Kannaḍa inscriptions made the same distinction between *rāja-bīdi* and *bīdi*, *hīriya-heddāri* and *heddāri* (Ramesh, *History of South Kanara*, 281).

4. With the exception of those mentioned by inscriptions, such as the rural roads in Basarū in Karpāṭaka and in Uttaramēṛūr in Tamilnāḍu (Ramesh, *op. cit.*, 281-2; Gros and Nagaswamy, *op. cit.*, 93-4).

1. Construction and Maintenance of Roads

Which roles in the Indian network were allotted to the simple trail, levelled by the repeated treading of man and animal, the scantily metalled dirt track, or the artificially constructed route, provided with a durable surfacing?¹

a. THE FEATURES OF THE ROADWAYS

The testimony of European wayfarers who travelled the country during the Mughal period, as well as archaeological documents, demonstrate that original techniques were found, variable from region to region and in accordance with the given requirements.

Kaccā Tracks

Stretches of open terrain cover the plains and plateaux of India, offering natural ways and means to land communication which over a good part of the year might be utilized without necessitating human labour. Thus, during the dry season, when in the northern plains or on the Deccan Plateau the earth's surface is baked and hardened by the tropical sun, vehicular travel is possible along a course of tortuous lines in nature's charge, without further intervention other than the removal of an occasional obstacle.²

1. Text-book authors have advanced opinions on this subject which reflect more the political preoccupations or the prejudices of their epoch than the historical documents. MacGeorge (*Ways and Works*, 67), assessing the British achievements of the nineteenth century in the domain of public works, reckons that prior to the *pax britannica* there were no constructed and permanent roads in India. Today, on the contrary, Indian writers have the tendency to over-estimate the work of their ancestors. Thus, a recent study of the Indian road (*History of Road Development*, 16-18), systematizing the theoretical data of the ancient treatises, would have us believe that the structure of the ancient roads differed but little from those of modern times (!).

2. The peasants knew to adapt to the natural conditions, even were they to have been unfavourable, as for example in the region of Vaḍodarā (Baḍodā), as is shown by a report from the end of the nineteenth century reproduced in the *Bombay Gazetteer* (vol. VII, 1883, 142). In the zone of red soil, the passageways offered no resistance whatsoever to the strain imposed by the weight and speed of vehicles; at the close of the harvest season, they were furrowed to such an extent that carts had to proceed across the fields in order to find an even surface. On black

Indian roads were for the greater part what English engineers have termed 'surface tracks' or 'fair weather roads', *kaccā*, rough (as opposed to *pakkā*, constructed) ways, developed according to formulae still in usage in many regions of India:³ after having cleared a passage in the jungle some 30 to 50 feet in width, the area to be traversed by the road was delineated by digging a small ditch on either side, the bumps were levelled and the depressions filled with, depending upon the terrain, clay, silt, sand, gravel or pebbles, in such a manner that the surface layer was slightly convex towards its centre, permitting thus of the drainage of water.

This, in a country wanting in durable materials, was the economic and efficacious procedure recommended in the ancient Hindu treatises, such as the *Śukranīti*,⁴ which prescribes, after having levelled the natural surface, that the roadways be provided with a convex cross-profile, 'like the back of a tortoise', so as to facilitate drainage.

These natural beaten tracks were well adapted to an organized rural society which had the wherewithal to maintain them, and in which seasonal traffic corresponded to the harvest periods. There was thus a considerable area of India over which communications and transport could be effectuated simply by levelling the terrain and undertaking minor improvements. Local and regional roads were most frequently of this type, as were even the main routes over the major part of their distance.⁵ This is again evidence that natural viability was a significant factor in communications.

It should, however, not be supposed that constructed roads had not been developed prior to the British period. Whenever, whether it have been resultant of geographical factors (traversing of mountains, of shoals), or because of human needs (proximity of urban centres or sacred precincts), it was deemed necessary to provide the roads with solid foundations or to execute other road works, the technical difficulties were audaciously resolved.

soil the conditions were no better; the two ruts formed by the wheels of vehicles were burrowed deeper and deeper, and when the bodywork of the vehicles touched the ground, one followed a new track alongside the former.

3. The description is to be found in MacGeorge, *Ways and Works*, 66-7.

4. *Śukranīti*, ch. I, 531-7.

5. Examples: the road from Haṇḍiyā to Hardā, to the south of the Narmadā, which dated from the eighteenth century, was according to the *Gazetteer of the Central Provinces* (1870 edition, 211), 'a wide track, well defined, but not metalled and out of repair'. As regards the old imperial highway in the Deccan, its course between Haṇḍiyā and Carvā could only be traced at the beginning of this century by the ruins of Mughal road buildings, as there was no longer any vestige of the roadway (*C.P.D.G., Hoshangabad*, 199).

Vestiges of made Roads

Traces of ancient roadways are still in evidence in many regions of India. Some have been discovered and studied by archaeologists; many have not as yet attracted learned attention. We think in particular of the countless embankments in South India which constitute the weirs of large irrigation reservoirs and upon which the present roads frequently follow a narrow and tortuous course. It is practically certain that these are segments of ancient roads, a thorough investigation of which should be undertaken on both regional and local levels, utilising if possible aerial photography to re-construct the courses, which would then be identified in situ by vertical cross sections.

However, one has not had the inquisitiveness, even in the case of identified roads, to make systematic probings of the composition of the roadways so as to study their structure. Certainly, it is no easy task, for the greater part of the metalled roads as well as the causeways have been re-metalled several times over by Indian and British engineers before eventually having been tarred.⁶ And, above all, expertise is required to distinguish the ancient strata and the modern layers of the foundations.⁷ Almost no efforts have been made in this respect, other than by the *Central Road Research Institute* of New Delhi, in collaboration with the Archaeological Survey of India.⁸ In order to achieve a more integral view of the ensemble, further investigations and probings are necessary.

We shall here restrict ourselves to the consideration of roadways within the vicinity of pilgrimage places and towns, to the passages made in the mountainous zones and to the causeways traversing the low-lying regions.

In the Environs of Religious Centres

Around or within certain of the religiously significant towns, streets

6. When at the close of the nineteenth century new roads were built in the famine struck zones of Baṅgāl, one almost always followed the ancient courses, recognizable by the remains of roadways, the vestiges of embankments or the ruins of old stone bridges (vide E. Vesey Westmacott, 'Relief Works in Bengal', *Indian Antiquary*, vol. III, 1874, 123).

7. Recently travelling along a route attributed to Tipū Sultān near Kīruṣṇakīri (Kṛṣṇagiri in Tamilnāḍu), which is today tarred, we would have been at a loss to undertake a probing and to analyse the strata of materials.

8. Vide *History of Road Development in India*, 19-22. Probes were made at only four sites, which is insufficient. The photographs which were published are of bad quality, and the accompanying notes are too summary and are to be utilized with caution.

and roads⁹ were sometimes paved to facilitate the access to these precincts for pilgrims. Thus, especially in the district of Paṭṇā, several roadways dating from the Buddhist period have been found.

In Rājgīr (12 km south of Nālandā), a road some 20 feet wide, covered with large, roughly hewn stones, led to the summit of the hill. Marshall, travelling there in 1906, thought that it was the '*Bimbisāra road*' of which Hsüan-tsang had spoken.¹⁰ Several kilometres farther to the east, at Giriyak, Buchanan had noticed the remains of a road approximately 12 feet wide, paved with large stone blocks, and evidently constructed so as to grant access to the numerous settlements in this topographically irregular area.¹¹ Some 20 km south-east, at Jeṭhiyān, an old paved road leading to a Buddhist cave was found, which in areas is cut into rock and is supported over a long distance by means of a stonework wall having a breadth of from 6 to 12 feet; another road is mentioned, some fourteen feet wide, made of roughly hewn stone blocks.¹²

The tradition of linking the various sanctuaries of a sacred place by means of stone passageways, or of steps cut into the rock when it is situated on a hill, has been continued throughout the ages, the work of religious communities or of wealthy pilgrims.

In the Karnūlu district, between Nāgalūti and the celebrated pilgrimage centre of Śrīśailam, the remains of a road paved with enormous stone blocks along a distance of at least 13 km were found. At the summit of the hill, upon which is located the Mallikārjuna temple, the way is continued by means of a stairway descending for 3 km directly to the Kṛṣṇā. Its steps, according to an inscription, were made in the fourteenth century by a local prince to facilitate the temple's accessibility for pilgrims coming from the north of the river. On the majority of stones the devout have engraved their names or images representing themselves prostrating in the direction of Śrīśailam.¹³ According to Manucci,¹⁴ there was in the seventeenth century 'a double line of hewn

9. A demi-medallion of a *vedikā* at Bodhgayā, as well as a bas-relief decorating one of the *vedikā* pillars at the Bhārhut *stūpa*, depict the incident commemorating the *Jetavana* donation (a *Jataka* scene): men, like genuine pavers at work, align on the ground peculiar square coins (Barua, *Gaya and Buddha-Gaya*, vol. II, fig. 54; *Barhut*, vol. III, pl. XLV, 45).

10. *A.R.B.*, 450.

11. *Ibid.*, 150.

12. *Ibid.*, 188-9.

13. Vide *Annual Report of the Arch. Department, Southern Circle, for the year 1917-1918*, 20 and pl. I (A), photograph: the causeway leading to Pātālagaṅgā (Kṛṣṇā); Sewell, *List of the Antiquarian Remains in the Presidency of Madras*, vol. I, 90-1. An inscription dating from the close of the fourteenth century mentions the construction of a paved track linking two temples near Sandūr in the district of Hosapēṭe (*Annual Report on South Indian Epigraphy*, 1922, n. 742).

14. Manucci, *Storia* (1st edition), vol. III, 237; vol. IV, 449.

stones' from Pāmpaṇ to Rāmēśvaram, probably serving as tracks for the temple chariot. In 1804 Valentia also noted that the road was paved.¹⁵

The access to temples set in the heights is frequently made easier by means of gigantic stairways, connected at their level stages by roadways; as, for example, in Tirupati, where a wide passage has been made in the rock which, from the first *gopura* at the foot of the mountain to the summit, covers a distance of 8 km.¹⁶ In like manner, on the Kāthiyāvāḍ peninsula even more spectacular stairways ascend to the extraordinary mountains sacred to the *Jain*, the Śatruṃjaya at Pālitānā, and the Girinagara or Girnar mountains at Junāgaḍh.¹⁷

These 'megalithic' works are, however, only to be found at certain places of pilgrimage, or in a few fortified towns.¹⁸ Elsewhere, there is no trace. The paving re-appears, in a much more modest form, at the approach to large urban centres.

Approaches to Large Urban Centres

It is probable that the constructed roads of ancient India existed only in the proximity of metropolises. The Archaeological Survey of India has brought to light several very ancient roadways in Madhya Pradesh. A road having been constructed with a layer of stones was discovered in Nāgdā, dating from the fifth to second centuries B.C.; in the proximity of Sāñcī rocky surfaces were cleared which would have been roads laid-out by the *Maurya*; finally, in Ujjain a vertical cross section taken from an ancient street shows a stratum of large stones on packed earth summarily arranged at a thickness of 32 cm.¹⁹

It is, in any case, certain that during the Mughal era the streets in a majority of towns lacked hard surfacing. Even in such a large port as Surat it was inconvenient to move about during the summer because of

15. Valentia, *Voyages*, vol. I, 343.

16. Sewell, *op. cit.*, 91.

17. Tod (*Travels in Western India*, 281-4, 369) described them in 1822.

18. As for example Ceñci (west of Pondicherry) where, within walls, one has hewn with pick and chisel ways leading to the hills of Rājagiri and Kṛṣṇagiri.

19. Vide *History of Road Development*, 19-21. At Ujjain ruts dug by the wheels of vehicles have also been found on an ancient road: "The road through the north-east opening varied in width from 46.44 m to 39.32 m and was marked by six successive levels, necessitated by wear and tear and rising ground level, and the tracks indicated by the ruts at each level in two rows, with the inner ones often overlapping, were invariably 1.75 m in width, a universal gauge of wheeled vehicles of the times" (A. Gosh ed. *Encyclopaedia of Indian Archaeology*, vol. II, 449). In the Talpura-*stūpa* site near Budhni to the west of the railway tunnel towards Bhopāl (Madhya Pradesh) a paved pathway (200 X 2 m) has been discovered, leading to the site from the ground level (*I.A.R.*, 1975-76, 30, pls. XL B- XLI A).

the dust; and, during the rains one had to wade through mud.²⁰ But, where a paving did exist, as in Lāhaur, Dehlī or Āgrā,²¹ it was likely to have continued on for some distance beyond the urban limits; such as at Rājmaḥal where, according to Tavernier,²² the road was covered with a brick layer for a distance of two leagues outside the city. Probings have been made of a Mughal road at Fatehpur Sikrī where a solid and compact mass of *kaṅkar* was discovered having a depth of 25 cm and covered with large stones;²³ however, the distance over which it was paved in this manner was not mentioned. Perhaps it yielded farther on to a dirt or gravel track. In any case, the light-duty Indian roads were planned in such a manner as to avoid as far as possible the necessity of engineering works, and it was therefore only in those regions of difficult relief or in the lowlands menaced by flooding that examples of a great technical audacity are to be found.

Passages in the Mountains

When an important route encountered steeply sloped segments or was blocked by a natural obstacle, engineering measures were employed to surmount the difficulties posed for communications. In the Western Ghāṭs, traces of hewn passages are to be discerned in the rocks at the Nāne, Kusur and Mālšej Passes (north-east of Mumbai), works of the

20. Thévenot, *Travels*, 123; Stavorinus, *Voyage*, 1777, t. I, 335; Grose, *Voyage*, 171-2.

21. Coryat, in *E.T.*, 161; Modave, *Voyage*, 195. In the ancient Hindu capital of Vijayanagara, several roads laid out on rocky surfaces can be seen; one also finds in the low zones traces of paved ways (vide V. Filliozat, 'Town Planning of Vijayanagara', *Aarp* 14, Dec. 1978, 61-2 and photograph fig. 9; road with ancient pavement).

22. Tavernier, *Travels*, vol. I, 102. In Simraun, district of Campāraṇ on the Nepalese border, one has found in the old city (built prior to the thirteenth century?), near the palace, an embankment of some 50 metres in length covered by large bricks weighing one *man* each, and it is supposed that the roads were paved with this material. In Singhasinī (of the same district), an archaeologist reports, without giving details concerning its structure, an old road having a width of 14 feet which he followed for 500 metres (*A.R.B.*, 542, 544).

23. Vide *History of Road Development*, 21-2. K.K. Muhammad of the A.S.I. Madras Circle tells me (1990) that, during his survey in Dehlī, Āgrā and Fatehpur Sikrī he found 4 types of Mughal roads: 1. stone boulder paved road in which stones dressed in wedge or tooth shape were set in mortar in such a way that their thinner and sharper points always remained below, 2. huge stone slab road, in which the slabs were placed on prepared and hardened soil, 3. road with small rectangular stone slabs, 4. water bound macadam road. At Fatehpur Sikrī, the thickness of the road varies from 35 to 50 cm; the main road has a width of 15.40 m., the secondary road has a width of 3.65 m.

Peśvā;²⁴ Haidar 'Alī and Tīpū Sultān developed several passes in the mountainous border between Govā and KōLikkōtu (Calicut).²⁵ On the Ellorā route linking Daulatābād and Rauzā the Pīpalghāt ascent was paved at the behest of one of Aurangzeb's officers.²⁶ To the north of Maheśvar, ramps were made to alternate with landings for rest along the descent of the Vindhya by way of the escarpment dominating the Narmadā.²⁷ In the regions of Rājmaḥal and Muṅger, where the Choṭā Nāgpur Plateau meets abruptly with the Gaṅgā to form narrow gorges, works were executed to facilitate passage. The famous Sakrīgālī, considered as the 'gate to Baṅgāl', would have been opened during the period of the Hindu kings.²⁸ Śer Śāh had a gap cut into the rock along a distance of 50 metres so as to obviate a difficult ascent at Śaikh-pura.²⁹ In the direction of the Kābul basin to the north-east, the Khaibar Pass was, according to Abū'l-Faḏl,³⁰ cleared and enlarged at the order of Akbar to render it adequate for transport. At Mārgala, between Rāvalpīṇḍī and Ḥasan 'Abdāl, Aurangzeb in 1672 had the mountain cut-out over a distance of 180 metres in order to build there a solid roadway; an achievement commemorated with an inscription.³¹ Finally, the route from Kaśmīr must be mentioned, concerning which the sovereigns had been particularly attentive. Akbar chose its course and had the initial works executed, which were then pursued by 'Alī Mardān Khān after he had become provincial governor.³² The magnitude of that work must have been impressive to have induced Modave to write:³³ 'the Mughal emperors have at tremendous expense had the tracks so adapted that elephants might pass there'.

24. *Bombay Gazetteer*, vol. XVIII, Poona, 141.

25. *Bombay Gazetteer*, vol. XV, Canara, part II, 39; *M.D.M., Malabar* (Logan), vol. I, 62-4.

26. Seely, *Ellora*, 357; B. Codrington, 'Ancient Sites', *Indian Antiquary*, vol. LIX, 1930, 10. Thévenot (*Travels*, 107) mentions paved streets in Sultānpura (?), between Rauzā and Daulatābād.

27. Modave (*Voyage*, 504) did not appreciate this effort to compensate for the natural inclines: 'We descended this steep slope in which ramps had been made which are very badly attended, such that it is a tedious passage and dangerous for beasts-of-burden'.

28. *A.R.B.*, 509.

29. *Ibid.*, 533.

30. *Ā'in*, vol. II, 406.

31. 'We passed through Mārgala which is handsomely paved with large and clean stones. It was built by the late emperors of Delhi and it gives an idea of the energy of the workmen who cut the range of hills and made a passage through it, about 200 yards in length. We found a Persian inscription engraved on stone which was in the middle of the top of the hill and overlooked the pavement' (Mohanlal, *Travels*, 34; vide also Burnes, *Travels*, vol. I, 70; *P.D.G., Rawalpindi* (1909), 85).

32. Parmu, *Kashmir*, 42, 397.

33. Modave, *Voyage*, 359.

Traversing Low-lying Regions

The coastal plains and the great deltas, covered as they are by vast paddy-fields and large spaces menaced by floods, are not favourable to land travel. It is likely that the passageways followed whenever possible the alluvial cliffs formed by the rivers, unstable natural earthworks which could be demolished by the seasonal river swellings. But otherwise, it was necessary to take recourse to constructed roads.

In the irrigated zones to the south of the peninsula, the roads invariably proceeded on the dykes of the large reservoirs or *tanks* which often extended over several kilometres,³⁴ or on the hard earth bordering the irrigation canals.³⁵ On the east coast, where lagoons and marshes are abundant, the ancient roads sought solid and dry land,³⁶ but in many areas they necessarily had to follow embankments, which were the result of a considerable human labour.³⁷ The main route from Oṛiṣā to Baṅgāl traversing the alluvial plains, low and not well reinforced, was borne over long distances by embankments raised above the paddy-fields.³⁸

These works, constructed by generations of labourers, remain anonymous. On the other hand, archaeologists have discovered in Baṅgāl the vestiges of roadways which can in part be identified on the basis of local tradition, which (although popular memory is not always trustworthy) has conserved the names of those princes who had once patronized these enterprises. The first Muslim conqueror of Baṅgāl, Bakhtiyār Khiljī (1202-05) began the construction of a route, com-

34. Vide Mountain (*Memoir*, 106), who describes an embankment of this type at the entrance to Tiruvallūr, 40 km west of Madras.

35. It is interesting to note that in the ancient Tamil inscriptions the term *vati* is equivocal. Gros (*Uttaramēṛūr*, 93) specifies that it often appeared to signify *road*, but that there are cases where it manifestly is utilized in the sense of *vāykkāl* (canal), and where it is clear that the two words are used indiscriminately. 'The local definition, conciliating, is that *vati* applies to the road which adjoins irrigation canals'.

36. As for example from Bāpatla to Vētapālemu (district of Guṇṭūru), where it passed between the coast and an extensive zone of low-lying marshland on a long bar of sand, animated by the active and prosperous villages of weavers (*Table Géographique*, ms. of the *Muséum d'Histoire Naturelle*, No. 1765, 397-8; *M.D.M.*, *Kistna*, 203-5).

37. Anquetil Duperron (*Zend Avesta*, t. I, I, XCIX, CIII) found several to the south of the deltas of Āndhra: 'We went alongside it (the Kṛṣṇā River) for one and a half coss on a type of levee. Without these embankments, the roads filled with water would be impassable; but also this juxtaposition of ups and downs fatigues greatly.... Two coss from Gourour (to the south of Nellūru) is an embankment one and a half coss in length and four to five feet wide, broken in several places'.

38. Colonel Upton noted in 1777: 'the country is well cultivated, but very low, so much that the road for the greatest part is on causeways built on purposes' (Macpherson, *Soldiering*, 313).

pleted by *Ghiyāsh-ud-dīn* 'Ivaz (1211-26), linking Lakhnūr (Kānkjol, 25 km south of Rājmaḥal ?) with Debīkoṭ (30 km south of Dinājpur) via Lakhnautī (or Gaur). There, vestiges are still to be seen to the west of English Bāzār where it was built on the elevation of a dyke, thus enabling the passage of traffic during the rainy season.³⁹ Some 18 km farther north it appears to have traversed Pāṇḍuā, surfaced with bricks over a width of approximately 4 metres.⁴⁰ Finally, it is again found at Pātharghātā, where it crossed a stone bridge, today in ruin, over the Baliyā River, and then at Baṃsīhārī Hāṭ, east of Debīkoṭ.⁴¹ From there it continued on to Ghorāghāt, following a course which, according to local tradition, would have been reestablished by the present-day route via Patirām and Hili.⁴²

This city was also accessible by means of another, more direct route, which was the work of Husain Šāh (1493-1519), and traces of which still exist.⁴³ At the outset it was comprised of two branches, one

39. 'From Lakhnautī to the gates of Lakhnūr, and from the other side of the river as far as the town Deokot, embankments (*pul*) have been made which extend over a distance corresponding to a ten-days' march. The reason for these constructions is that during the rains, the entire country is flooded and, if there were no embankments, the people would have to travel by boat' (*Tabaqāt-i-Nāsirī*, in Elliot, *History*, vol. II, 318-9). Vide 'Ābid 'Alī Khān, *Memoirs of Gaur and Pandua*, 19 and n. 1, pl. II, f.p. 41 and pl. V, f.p. 94. According to Geddes (*Au pays de Tagore*, 70-5), there was some fifty years ago between Barddhamān (Bardvān) and the confluence of the Bhāgīrathī and the Padmā, an ancient road following a generally straight course which disappeared in the low-lands and reappeared on the plateaux. These vestiges would have been all which remained of the thirteenth century Muslim route. According to local tradition, an imperial route is said to have been constructed in the fifteenth century, 70 metres in width (?), banked and planted with trees, along which mosques were located every 10 km, leading from Gaur to the province of Barddhamān, where it bifurcated on one side to Sātgamv, and on the other to Medinipur (Midnāpur), the 'gate to Orīsā'. This route, repaired to a great extent during the previous century, is still used by traffic.

40. According to Buchanan, who visited Pāṇḍuā in 1808, 'a road paved with bricks, from 12 to 15 feet wide, and not very straight, seems to have passed through the whole length of the town, and from about half a mile south from Mukhdum Shah's gate may extend five or six miles to the north' (cited by 'Ābid 'Alī Khān, *Memoirs*, 94-5).

41. Following a study by H.E. Stapleton ('Notes on the Historical and Archaeological Results of a Tour in the Districts of Maldah and Dinajpur', *J.P.A.S.B.* (new series), vol. XXVIII, 1932, n. 1, 158, 161).

42. *E.B.D.G.*, *Dinajpur*, 87. Regarding the roads radiating around Debīkoṭ, some of which were yet evident at the close of the nineteenth century, vide the article by E. Vesey Westmacott, 'Relief Works in Bengal', *Indian Antiquary*, 1874, vol. III, 123.

43. In his historic description of Dinājpur (in Martin, *Eastern India*, vol. II, 643), Buchanan wrote: 'Hoseyn Shah formed a fine road through the country between the Tanggon and Punabhoba, and it is said to have extended to Ghoraghat; but I have not been able to trace it. The width is said to have been 348 cubits,

arriving from Māldah, the other from Pāṇḍuā. The latter was still in good condition in 1932, near the eastern gate of the old city, where it was about 15 metres wide and offered a convex cross profile with a beautiful brick surfacing; a magnificent specimen of ancient road which should have been examined.⁴⁴ At Rānigañj, where these two ramifications met, the route traversed the Taṅgan River over a bridge (whose arches are today mutilated) and continued eastwards along a uniform embanked line which can be followed for approximately 5 km;⁴⁵ after which its traces are lost, but it probably met with the former again in the region of Hili.⁴⁶

Ghorāghāt was also linked with Kāmatāpura (to the south-west of Koc Bihār) by means of a track said to have been constructed by *rājā* Nīlambara, king of Kāmarūpa, who was dethroned in 1498 by Husain Śāh. It proceeded by way of Pīrgaṇj, Malaṅgā and Bhoṭmārī, where imposing road embankments have been found bearing witness to the magnitude of these works.⁴⁷

In the Sundarban, at Bāghirhāt (35 km south of Khulanā) an old roadway was found which measured 12 feet wide and was partially surfaced with bricks. Local tradition would have this to be the work of

with a large ditch and many fine trees on either side, and bridges constructed of bricks. The whole is overgrown and gone to ruin; from these dimensions, it must rather have been a work of ostentation than utility, and probably was rather an appendage to the country residence of the kings at Sekundra, than a military way to Ghoraghat'. If the road had not been built by Husain Śāh, it was perhaps repaired by him.

44. 'Further enquiries at the time of my visit showed that a *pucca* brick-on-edge road ran to the Adīna Mosque from Rānigañj, and, on following this up, a fine and well-cambered specimen of the roadway was found absolutely intact, just inside the Eastern Gate of Pāṇḍuā where the road passed through the eastern line of fortification. The road here measures as much as 51 feet in breadth, and this specimen of the old road should certainly be proclaimed as a protected monument by the Archaeological Department as nowhere else (so far as is known) has any similar stretch of road been found' (Stapleton, 'Notes, *J.P.A.S.B.*, vol. XXVIII, 1932, n. 1, 154).

45. *Ibid.*, 152-3.

46. The author of the Gazetteer of Dinājpur (*E.B.D.G.*, *Dinajpur*, 88) states that one encounters several sections of this embankment which in many places has disappeared, particularly in the forest zones.

47. 'Where the country is low, it is raised to a very great height and is a grand work worthy of a magnificent prince' (*L.A.M.B.*, 182). In his history of Koc Bihār (in Bengali, transl. by Goshal under the title: *A History of Cooch Bihar*, 54-5), Amanatullah Ahmed reports the local tradition according to which *rājā* Nīlambara is said to have constructed, other than the route from Ghorāghāt, a road leading to the region of Jalapāiguri, to the north-west, the course of which can yet be discerned by means of the tanks, now in ruin, which are found at regular intervals in this direction, and another leading to the mountainous border to the north.

Khān Jahān, a local prince during the mid-fifteenth century.⁴⁸

Those earthen embankments must also be mentioned which have been found between *Madārīpur* and *Nācol* (on the border of the *Rājśāhī* and *Māldah* districts) and would have been sections of the imperial highway from *Sonārgām* to *Gauṛ*, planned by *Śer Śāh*;⁴⁹ as well as the remains of the route from *Ḍhākā* to *Murśidābād* constructed by the viceroys of *Baṅgāl*, which were still evident in the middle of the last century.⁵⁰

Finally, among the more recent works, there is the celebrated levee (*jāṅgāl*)⁵¹ of the *rānī* *Bhabānī* of *Nātor*, dating from the second half of the eighteenth century: a solid work provided with stonework bridges, allowing pilgrims to go on foot during periods of inundation from the region of *Caugrāma* (*Rājśāhī* district) to the shrine in *Bhabānīpur* (district of *Bagurā-Bogrā*).⁵²

Systematic research in *Baṅgāl* should result in the discovery of further vestiges of road works,⁵³ but it is highly unlikely that one were to discover such astounding achievements as those represented by the Assamese *āli*.

The Assamese Āli

The *Brahmaputra* Valley is a vast alluvial plain submerged during part of the year by the waters of its swollen rivers, which then subside in the dry season to leave behind abandoned rills, marshes and silt tracks. Interchange and communications would have been difficult had not its

48. *B.D.C.*, *Khulna*, 164.

49. *A.S.R.*, 1922-23, 109. Concerning the course of this route, vide *supra*, 41 and n. 22.

50. 'Traces of this road still remain where destructive inundation, or the still more destructive encroachments of agriculture have not carried it away. We have seen this road in some places almost as complete and in as perfect repair as the day it was laid down—its breadth, solidity and permanency doing honour to its founders who where in all probability *Murshid Kuly* or his successor *Aliverdi*; and the great banyan or pipul tree which with a singular perversity the road-makers had planted not on both sides or one of the sides but exactly in the centre still flourishes as a grateful protection to the wearied traveller' (*Calcutta Review*, vol. IX, 1848, 16). Unfortunately, the author of the article does not indicate the areas in which these traces were situated.

51. *Jāṅgāl* (Beng.), barrage, dyke, embankment.

52. The *rānī* *Bhabānī* assumed power in *Nātor* anno 1758 to then rule for half a century. She was noted for innumerable charitable works (*B.D.G.*, *Rajshahi*, 47, 172).

53. In fact, the routes would have been built by *Husain Śāh*, from *Sonārgām* to *Khulanā*, according to *Taylor* (*Sketch of the Topography and Statistics of Dacca*, 199), and by *Mir Jumlah* from *Dhākā* to *Khizrpur*, according to the author of *E.B.D.G.* (*Dacca*, 30).

inhabitants countervailed the natural drawbacks with artificial works which have demanded prodigious efforts and merit a place in the history of engineering. The problem, related to that of the drainage and cultivation of the land, was resolved in an original manner by raising in the plains exposed to inundation enormous embankments which were simultaneously *āli* (roads) and dykes (*bāndh*), serving as passageways while at the same time protecting the cultivated land from the rising of the rivers.

This long and exacting work, combining communications and drainage, seems to have been carried out with a particular vigour in the sixteenth and seventeenth centuries. North of the Brahmaputra, the *Gohāin Kamal Āli* was completed in 1562 under the reign of Nara-nārāyaṇa, an embankment extending for 560 km and linking Koc Bihār and Nārāyaṇapura, well-preserved sections of which still remain.⁵⁴ On the other side of the river, the energetic *Āhom* sovereigns achieved the construction, above all in the heart of the kingdom (the present Śivasāgar district), of a dense network of embankments constituted of two principal axes, in a west-east orientation, of approximately 200 km, the *Ceuni* and *Dhodar Āli*, which intersect various routes running north-south, thus enabling practicable communications among the human settlements.⁵⁵ The fact that the local chronicles have preserved the names of the builders is of import.

Unfortunately, in the wake of the anarchy which became prevalent in the valley region during the course of the eighteenth century, and above all resultant of the Burmese invasion (1817-26) which brought ruin to the country, these works were deprived of the requisite maintenance and quickly deteriorated to inutility; entire segments vanished in the jungle. British engineers, who had gone to Āsām to lay

54. Hunter's map in *Statistical Account of Assam* indicates the course along some 60 km. Vide Gait, *History of Assam*, 51; Shakespear, *History of Upper Assam*, vol. I, 24, 84; Gogoi, *The Tai and the Tai Kingdoms*, 320. This embankment, the work of Gohāin Kamal, brother to the sovereign, was said to have been built in two years! S.F. Hannay ('Notes on Ancient Temples and other Remains in the Vicinity of Suddyah, Upper Assam', *J.A.S.B.*, vol. XVII, part I, 1848, 462) thinks that it existed well before the sixteenth century, that the pilgrims coming from Kāmarūpa en route to visit the temples of the Upper Brahmaputra must have used it, and that consequently Gohāin Kamal would only have remodelled the road or completed the construction of certain sections.

55. The *Ceuni Āli* (today's trunk road) traversing the entire district along 210 km. was constructed by Jayadhvaj Siṅgha (1648-63). Gadādhara Siṅgha (1681-96) completed the *Dhodar Āli*, an embankment parallel to the former, linking Kamārgāom and Jaypur through the south of the valley. Among the roads running north-south was the *Nagā Āli* which led to the vicinity of Śivasāgar in the Nagā Hills. Most of the sovereigns of this dynasty built or repaired one or several ramifications of this network (vide Gait, *History of Assam*, 99, 119-20, 123, 140, 170, 181, 185; Gogoi, *The Tai and the Tai Kingdoms*, 313, 383-4, 386, 437, 501, 509).

out the course of the modern road network, discovered remains which they further utilized whenever possible; for these earthen walls⁵⁶ were admirably conceived so as to always be at least 2 feet above the maximum water level, with breaches opened at well-selected points to permit the passage of streams. Major Briggs did not conceal his admiration of the perfection of their general alignment and their longitudinal and transverse profiles.⁵⁷ Describing the *Bar Āli* (main road), which in large part corresponds to the *Dhodar Āli*, he emphasized the technical qualities of this embankment, of which 'about 70 miles remains to show the stupendous nature of the work':

From the height of the embankment it is visible 2 miles off. The width at the top is from 35 to 40 feet. Its course is generally perfectly straight, and where there is a bend the curve is formed with mathematical precision. The trenches are dug with equal regularity and never approach nearer than 100 feet to the road centre. So thoroughly has it reformed the water system of the country that in one place the whole drainage of 30 miles passes through 4 openings of about 100 feet each, and the sides of these openings have not been eroded by the passage of the waters for more than a century.... Relics of their efforts remain which for bold engineering skill and a wonderful contempt of difficulties deserves to rank with the works of the Romans.⁵⁸

Nevertheless, as the majority of Indian roads, these earthen embankments were not protected by a surfacing of durable materials: they were not metalled. One can indeed wonder why this was so, and ask why, being such builders as they had been, they neglected to make more solid roadways.

Why were the Indian Roads not Metalled?

General considerations do not suffice in answer to this question.⁵⁹ To

56. J.M. Forster ('Note on Ghargāon', *J.A.S.B.*, vol. XLI, 1872, 38-9), studying the embankment encircling the palace of the *rājā* of Garhgāon, states that it was 8 feet high, 15 feet wide at the summit, and that the interior of the work contained a core of bricks ('The core of the bund (*bandh*) is said to be bricks and is covered with earth, now overgrown with forest trees'). No one else mentions this layer of bricks. It is possible that it had existed in this embankment which protected an official building, but elsewhere it certainly seems that only earth was used.

57. 'Their lines of roads were generally so well chosen as to direction that if we can only afford to make the roadways as massive as their bold projects require, many portions of their works may be adopted' (Briggs, 'Roads in Assam', *Professional Papers on Indian Engineering*, 1st series, vol. III, 1866, 50).

58. *Ibid.*, 53-4. Forster ('Note', *J.A.S.B.*, vol. XLI, 1872, 39) expresses even greater admiration: 'The Romans have the reputation of being the masters in the art of road-making, but their efforts seemed small compared with the network of enormous bunds intersecting the country in all directions and made absolutely from mud alone, no other material being procurable'.

59. We here refute principally the explications provided by A.H. Kadri in 'Routes and the Transport System of the Great Mughal', *I.G.J.*, vol. XXII, 1947, 84.

reply that the Indians were not sensitive to the advantages of the constructed (*pakkā*) roads which would have enabled more rapid communications, because the notion time-span and celerity was foreign to them, would be to repeat a commonplace. To suppose that the first Mughals, having been amply occupied with their conquests, had contented themselves with loose surface roads, hoping that their successors would consolidate them, which then could not be done because of the decline of the empire, is to presume that the most capable sovereigns of the dynasty had conceived of a road network which only their descendants would be able to utilize — an absurd hypothesis. Finally, to accentuate the supposed 'oriental resignation' by constating that formerly, as today, rural society had accomodated itself very well to *kaccā* roads, is to once more beg the question. For why, then, do so many villages still not have hard-surfaced roads which would much better withstand vehicular transport? The reason is very simple: in many regions of India, particularly in the alluvial plains, there exist no hard materials with which to make the roadways. There are no stones for metalling the surfaces. In the plains of Baṅgāl or Āsām, for example, one might journey over hundreds of kilometres without finding a pebble;⁶⁰ and, prior to the establishment of the railway, there was no question of having them brought from other provinces.⁶¹ On the other hand, clay is to be found, which in the form of baked bricks was largely employed in construction and represented one of the chief materials in the regional architecture. If one wished to provide the roads with solid foundations, it was utilized as a bottom layer, placing the small, rectangularly shaped blocks on the earth, upon which was deposited a surface layer composed of pounded bricks (*khoā*);⁶² an ancient proce-

60. 'Persons whose experience is confined to Europe may find it difficult to realize the idea of a perfectly flat country extending for several hundreds of miles in every direction, and where there is not so much as a pebble to be found throughout its whole extent. Such is Bengal. Stone if used must be brought from enormous distances, and the only possible substitute for it as road surface is the expensive and imperfect one of broken bricks' (G. Chesney, *Indian Polity*, 282-3).

61. In Kalikātā, prior to the advent of the railway, the English *Company* macadamized its roads with stones which were brought by ship (*ibid.*, 283, n. 1).

62. Solvyns (*Lex Hindous*, t. III, picture: road in Baṅgāl) describes thus the route from Kalikātā to Bārākpur: 'It is paved with bricks, as are all the main roads in Baṅgāl, and on top of this paving is a layer of sulky, or broken bricks, which forms an excellent roadway'. (The author means *surkhī* (H.) or *khoā* (H., Beng.) a cement of lime and pounded bricks.) The same observation in Tennant (*Indian Recreations*, vol. II, 68): 'There are hardly any materials except pounded bricks which is generally overlaid upon a stratum of the same materials in their unbroken state. In the upper country there are indeed quarries of free stone and whin rock, but the carriage of these materials to so great a distance implies an exertion and an expense far exceeding the present circumstances of the government'.

ture⁶³ which was not without its drawbacks. The roadways of this type were expensive, were not very resistant and necessitated regular maintenance. For these reasons, roads built in this manner were found only in cities or their proximities.⁶⁴

The nature of the soil is not more favourable to traffic in the other deltaic zones; as for example in the Tañcāvūr district,⁶⁵ where, at the beginning of this century, road metal was brought from Śrī Laṅkā so as to macadamize the roads in Kāraikkāl and Taraṅkampāṭi (Tranquebar).⁶⁶

In the other regions of India, various materials⁶⁷ of rather poor quality are to be found: *kaṅkar* in the plains to the north, laterite in the Deccan, *murum*⁶⁸ in the mid-region of the country. These materials were used to reenforce the roads in those areas in which they were immediately accessible, but otherwise there would not seem to have been much concern regarding the solidity of the roadways.⁶⁹ It was not requisited by the traffic, as if a kind of equilibrium were to exist between the road conditions and the techniques and modalities of travel. In the great plains of the Gaṅgā and the Indus, where an admirable fluvial network assured the greater part of the communication needs, the imperfect land routes were sufficient for interrelations; on the plateaux one contented oneself with light roads, all the more so as conveyance by beast-of-burden, which does not place great demands on the materials of the roadway, was the most common mode of transport.

63. According to Asad-al Husainī (in Sarkar, *Bengal Nawabs*, 3), it was Aurangzeb's son, Muḥammad 'Azam Śāh, governor of Baṅgāl (1678-9), who would have first had the idea to surface the roads with bricks in the region of Dhākā, and his example would then have been followed by the wealthy proprietors in their domains. In fact, this technique was utilized well before the seventeenth century in western Baṅgāl to pave city roads, as is shown by the examples we have cited *supra*, 104 and n. 22.

64. *Calcutta Review*, vol. IX, 1848, 18.

65. Cordier (*Historique et Statistique de Karikal*, 195) mentions in 1825 the difficulties to be surmounted to build the roads: 'One thinks it will be difficult to construct a good road from the Andelar River to Karikal, because the terrain is completely of sand, and because there being no hard material anywhere nearby it would be necessary to send quite far to find some, for it must be stamped to render it solid, all of which requires a great expenditure'.

66. M.D.G., *Tanjore*, 1906, 137.

67. The extraction of good quality rock in granite or sandstone quarries is limited to certain zones and is costly.

68. Generic term designating variety of gravel somewhat harder than simple earth, used in road-metal.

69. Vide MacGeorge, *Ways*, 76-8. Hugel (*Travels*, 216), crossing at the Mārgala Gorge in the Pañjāb, which was developed by Aurangzeb (vide *supra*, 105 n. 31), remarked that this paved segment perhaps owed its existence to the fact that it was the only area between Aṭak and Lāhaur where one could procure stones

The Effects of Natural Factors on Road Lines

This type of road was very susceptible to the conditions set by the physical environment, the topography and the appearance of water in particular, as Rennell remarked in the eighteenth century:

In India the roads are at best little better than paths, and whenever deep rivers (which in that country are frequent, and without bridges), morasses, chains of mountains, or other obstacles, oppose themselves to the line of direction of the road, it is carried round, so as to effect the easiest passage.⁷⁰

In regions of elevated relief, tracks departed from the valley floor menaced by river swellings to climb the slopes and attain the ridge-lines. In the plateaux and plains lacking navigable waterways, passages avoided the humid soils, the marshy areas, and sought firm and certain terrain so as to minimise the necessity of engineering works, even though long detours were required.⁷¹ In the south of the peninsula, the tracks moved away from the streams and rivers little adapted for navigation; the routes over the plateaux or the eastern plain had not sought to approach them, except in the deltas; and, by the same token, the transversal arterial route running from Surat to Macilipatṇamu did not follow the Godāvārī.

On the other hand, in those regions favoured with navigable rivers, the roads regularly followed the waterways, while avoiding as much as possible the zones susceptible to flooding. If the roads or tracks had to draw away from them in certain areas, they hastened to rejoin the waterways a short distance farther along. The case of the main roads in the Indo-Gangetic plain is paradigmatic: the imperial highway extending from Dehlī to Baṅgāl did not depart from the banks of the Jamunā and the Gaṅgā except along short stretches. Also in the Pañjāb the roads were directly linked with the rivers; and, when considering the first detailed maps of the North-West,⁷² one is struck by the docility with which the roads conform to the waterways. The route from Lāhaur

(‘Perhaps it is owing to its being the only rocky hill between Atok and Lahor, that the honour of a paved road has been given to it.’).

70. Rennell, *Memoir*, 1792, 6.

71. In distinction to the modern roads, whose lines are imposed by the bridge emplacements and which attempt to cross the rivers at the more narrow parts of their courses, the ancient routes sought the widest and shallowest points which were fordable. Passing through the countryside, they conformed also to the boundaries of fields and villages and inevitably ignored the straight path dear to modern engineers. (‘Report Civil Engineer on the Condition of Roads and Certain Rivers in the Madras Presidency for the Years 1841 to 1843’, ch. 20, *Tamilnādu Archives*, ms. No. 9660, letter No. 39.)

72. As that given by Thornton in vol. I of *G.C.A.I.*, 1844, or that published in 1849 by W.H. Allen, entitled: *Map of the Punjab and the Sikh Territory*.

to Multān does not depart whatsoever from the Rāvī, scrupulously following its numerous meanderings. Other passageways would appear to have been less servile; they cut straight between the meanderings, but hesitated to move very far away, as if they could not detach themselves. To the east of the Five-Rivers nothing similar is seen along the meagre, unnavigable waterways of the Indo-Gangetic threshold. It is thus that the lines of land communication were attracted to the waterways, by which they could at any time be relieved or replaced. This submission to the hydrographic network, an indication of inferiority, had as a consequence the multiplication of deviations and thus the considerable lengthening of distances.

b. ROADWORKS

These roads without genuine foundations withstood traffic but badly. The repeated passage of cattle and waggons during the dry season weakened and deteriorated the light roadways which, when the monsoon broke, were carried away by the waters. Thus, at the close of the rainy season, roads demanded constant attention and regular repairs throughout the country. Upon which principles was this maintenance based?

Principles

If one gives credence to the law treatises of ancient India, the roadways were an object of government concern, which included the overseeing of their maintenance, utilizing for this purpose funds provided by the payment of rights-of-passage, and as well the temporary contribution in terms of manual labour owed by certain categories of the population. It seems in fact, that the numerous tolls collected for men, animals and vehicles were in their inception intended partly for the construction and repair of roadways⁷³ and that, to ensure the recruitment of manual labour, there was a system analogous to the 'corvée' of the French

73. The *Arthaśāstra*, bk. II, ch. XXI, XXVIII, XXV (pp. 123, 141, 160 of Shamasastri's translation) describes in detail the various departments responsible for the collection of passage tolls and places emphasis on the role of the functionaries called *antapāla*. Megasthenes (*Fragment XXXIV*, in Strabo, *Géographie*, book XV, I, 50) also speaks of state agents, who were concerned with the roadways. The *Sūkrāniti* (ch. IV, II, 258) specifies that the taxes were to be raised not only from merchants, but also from all who used the roads: 'The king must demand the funds requisite to the maintenance and repair of roads from those who utilise them'. It adds (ch. I, 536-7, ch. IV, 215-6, 229-30) that prisoners could be employed for repair works. In Mughal times, these tolls, called *rāhdārī* (H.), *rahdārī* or *rahādārī* (Mar.), were diverted to personal ends of the local authorities and the imperial administration continually fought to constrain such abuse (Habib, *Agrarian System*, 67-8, 78).

Ancien Régime.⁷⁴ However, lacking regional studies, we are uninformed regarding the practical implications of these principles in the different areas of India. Awaiting the systematic examination of inscriptions which would provide new facts, we can only make avail of the summary information presently available.

Role of Local Authorities

Road management appears to have been principally a village responsibility. At the close of the rainy season, the peasants were held responsible for the repair of the roads and ways of which they were the primary users. These services were demanded of them under the form of uncompensated contributions. In the Farrukhābād⁷⁵ and Gorakhpur⁷⁶ districts, local authorities were at the beginning of the nineteenth century charged with the periodic repair of the routes crossing their territory. In the Medinipur district, the earthen embankments, which offered protection from flooding and could serve as tracks, were annually repaired after the same fashion.⁷⁷ Even recently, in the region of Vaḍodarā (Baḍodā), following the rainy season, the peasants filled the holes and levelled the ground of rural tracks within the limits of the village.⁷⁸

In the case of urgent repairs (for example, on the occasion of royal journeys or the passage of an important functionary) recourse was taken to the same procedure. In Western India, as Forbes relates,⁷⁹

74. According to the Laws of Manu (*Mānavadharmasāstra* (bk. VII, 138) and the *Sukranīti* (ch. IV, II, 241), the sovereign could demand temporary service (one or two days monthly) of certain of his subjects. Hsüan-tsang (*Travels*, transl. Watters, vol. I, 176) in the seventh century mentions this custom which, according to inscriptions (L. Rice, *Mysore and Coorg*, 176), seems to have been established at the close of the thirteenth century in the Hoysala kingdom before having been adopted by the Muslim princes. During the Mughal period, this uncompensated contribution, which included not only human labour, but as well the use of animals and vehicles, was called *begār* (Habib, *Agrarian System*, 150, 248). Vide also Altekar, *History of Village Communities in Western India*, 98, and Sen, *Administrative System of the Marathas*, 532-4.

75. Valentia, *Voyages*, vol. I, 194-5.

76. Regarding the subject of care allotted to the roads of the district, Buchanan (in Martin, *Eastern India*, vol. II, 579) noted in 1807: 'The landholders say that they have made and kept the whole in repair, each man doing what is necessary on his own ground when he was ordered...the landlords of course did nothing but order their tenants to work'.

77. B.D.G., *Midnapore*, 1911, 164.

78. *Bombay Gazetteer*, vol. VII, *Baroda*, 142.

79. *Oriental Memoirs*, 1837 edition, vol. II, 59. Vide also Cordier, *Historique et Statistique de Karikal*, 195: 'The road from Karikal to the Great Aldea was made hastily in 1823 for the passage of an Indian prince; formerly there had been but a trail, and being laid out and executed in haste, it is a work to be done again'.

'according to the custom of the country, the works are executed *gratis* for the governors and officials....At the arrival of the *harkārah* (messenger) in the village, announcing the eventual approach of an important personage, notice is given to repair the road as far as the next village, and so on. On light ground this is a work costing little and quickly carried out'.

According to administrative documents from the reign of Aurangzeb,⁸⁰ members of the imperial family could, on the occasion of hunts, require the local chiefs to put the tracks in good condition, or to clear new ways into the jungle (*jaṅgal-bārī*).

Was this requisition of manual labour for the management of roads general practice, or of exceptional character? We do not know, especially since no very clear distinction was made between the temporary service owed by the peasant to the village authorities and the uncompensated contribution of manual work occasionally demanded by agents of the state.

Assamese System

In any case, nowhere else in India would these obligatory services seem to have weighed so heavily on the people as in Āsām. Under the *Āhom* kings, all male adults (*pāik*) aged between 15 and 50 were grouped in units of four (*got*); soldiers in the case of war, labourers during times of peace, they were employed, each in their turn, in the service of the state. Which is to say, all citizens were obliged to give the government three months' work per annum.⁸¹ This veritable mobilization of the populace permitted the *Āhom* sovereigns to achieve the extensive works previously mentioned.

Diversity of Roads

In the remainder of India, where such constraint did not prevail, road works were not really administrated, with the exception of certain routes deemed by the sovereigns to be of vital military or economic significance. The following is an example drawn from Maratha country. In 1783-84, Mādhava Rāo ordered Bālājī Mahādeva, *māmlatdār* (tax officer), of the Śivner *tāluk*, to repair the road leading to the Mālśej Pass, and to raise the requisite funds for this work from two different departmental sources: the receipts from revenue-tax were to provide one quarter of the amount; the remainder (three quarters) was to be given by the *kamāvīsdār* of *jakāt* (civil servants charged with the

80. Persian manuscripts cited by Habib, *Agrarian System*, 248 and n. 38.

81. Vide *Tungkhungia Buranjī or History of Assam*, XXIX-XXX; Gogoi, *The Tai and the Tai Kingdoms*, 550-1.

collection of tolls).⁸² This would thus be an indication that there was no official agency for road administration, that the funds destined for the maintenance of roads did not constitute a special budget, as they were drawn from different budgetary sections, and therefore would have been of an exceptional character. It is not likely that the Mughals managed affairs any differently in this respect.

This absence of regular resources and the heterogeneity of departments explain that the roads were not maintained in all regions after the same fashion, and that road conditions were dependent upon the manner in which the local populace fulfilled their obligations. In certain areas, even on the secondary roads, very well maintained stretches were to be found, as for example at the exit from Patnā, where Modave noted in 1774: 'I have nowhere else in India seen a road having the beauty and regularity of this one. It is as straight as a die, bordered by two trenches and it could not have been better built. It appeared to me that one gives much attention to its maintenance'.⁸³ Elsewhere, there was but little concern for the public roads, and the same traveller observed, very near to Faizābād, that the irrigation channels elevated above the level of the surrounding ground 'passed from one field to another, without regard for the large road, where one is frequently interrupted by these earthen embankments in which openings must be made for passage. Therefore, it is necessary to have in one's following several picks in proportion to one's pace and several peasants knowing how to brandish them'.⁸⁴ Heyne,⁸⁵ in the South of the peninsula, was to remark that in the region of paddy-fields the peasants continued, despite interdiction, to cut the road with ditches so as to allow the water-surplus to flow from their fields, or to benefit from that of their neighbours, which they considered to be their right. And, in any case, the seasonal maintenance was scant, superficial and did not prevent the worsening of the roads from day to day. For which reason, the state, principal user of these communication lines, was very often obliged to directly intervene.

Direct Intervention of the Sovereigns

So as to be able to travel with their entourage, or to facilitate the movements of their armies, the sovereigns had to have the roads

82. Nine years later, when the same route was repaired for the second time, passage tolls also provided the largest part of the funds (Sen, *Administrative System of the Marathas*, 331).

83. Modave, *Voyage*, 136-7.

84. *Ibid.*, 183.

85. Heyne, *Tracts*, 18.

maintained by a specialized department placed under their authority. As early as the *Rāmāyaṇa* epoch, according to Vālmīki,⁸⁶ whenever the king wished to travel by way of tracks which were in bad condition, he delegated the responsibility of rendering them suitable for vehicles to a group of engineers, technicians and labourers. At the time of Akbar, there was a department directed by the *Mīr Bahr*, simultaneously navy officer and agent of the highways department (?),⁸⁷ who was occupied with the works of fortification, the organization of lands and management of the communication routes;⁸⁸ in sum, a kind of engineer corps, such as is known in the French army.

It is practically certain that, in one form or another, this department existed throughout the Mughal period, for it is frequently mentioned in the contemporary accounts. Monserrate,⁸⁹ who in 1581 followed Akbar from Āgrā to Kābul, relates that the emperor dispatched 'sappers and workers to level the road as much as possible'. According to Manucci,⁹⁰ Aurāṅzeb was always preceded by a thousand labourers equipped with axes, shovels and picks to clear the difficult passages. Jahāṅgīr, in his memoirs,⁹¹ specifies that before setting out for Kaśmīr, he dispatched a great number of craftsmen, stone-cutters, carpenters and navvies, under the orders of a certain Nūr-ud-dīn-Oulī, to repair the Pūñch route. This corps of sappers was also responsible for the opening of new ways, and Mīr Jumlah, pursuing Śujā in 1659, had a track cleared in the jungles of the Choṭā Nāgpur by his wood-cutters and

86. The well-known passage in the *Rāmāyaṇa* (bk. II, 79, 13; 80, 1-22) which relates how Bharata had a road constructed, so as to visit his brother in exile, with the group of engineers, architects, technicians, carpenters, wood-cutters, rope-makers, roadmen, labourers and hirelings, has been utilized in the monographies (vide inter alia, Auboyer, *Vie quotidienne*, 94-5; Srivastava, *Trade*, 121-2) to demonstrate the high technical level of the roadworks of that period and the excellence of the ancient routes. In reality, this text recollects many accounts of the Mughal period, which describe the travel of the emperors. It proves that the way leading to Rāma's retreat was quite simply a miserable track and that, to be able to travel it rapidly, Bharata was obliged to dispatch a multitude of workers.

87. The post was then confided to Qāsim Khān, who supervised the construction of the new fort at Āgrā, and who was celebrated for his ability to assemble boat-bridges (*Akbarnāma*, vol. II, 372-3).

88. Irvine (*Army*, 173-4), referring to documents from the reign of Aurāṅzeb, gives a list in tabular form of the different technicians employed in the corps. Particularly to be noted: carpenters, blacksmiths, cotton carders, masons, leather specialists, mechanics, turners, sawyers, navvies, miners, wood-cutters, farriers.

89. Monserrate, *Mongolicae*, 80-1.

90. Manucci, *Storia*, vol. II, 63.

91. *Tūzūk*, vol. II, 97-8. He adds (*ibid.*, 179-80) that there were two *zamindār* on this route charged to control the traffic between Hīrapur and Bahrāmghala; evidence that the Kaśmīr route was administered. It was, nevertheless, only repaired at the occasion of imperial journeys.

beldār (navvies), with the employment of elephants.⁹² At the time of his retreat from Āsām in 1663, he also constructed with the aid of the local inhabitants, a road upon which five or six cavalymen were able to proceed abreast.⁹³ Thomas Roe⁹⁴ relates that Jahāngīr did the same when he went from Raṇṭambhor to Ujjain.

Road Policy of the Maisūru Sovereigns at the Close of the Eighteenth Century

The role of the energetic sovereigns of Maisūru, Ḥaidar 'Alī and Ṭīpū Sulṭān, must be emphasized, who, menaced by the English *Company*, and sensitive to the importance of the communications problem, were the only Indian princes to have had a road policy comparable to that of the Grand Mughals. Their capital, Śrīraṅgaṇa, situated on a strategic islet on the Kāvēri, became the nexus of all the main roads of the realm. In order to enable an easier passage to the Kaṇṇāṭaka coast, Ḥaidar 'Alī developed several tracks through the forest and surfaced several passes in the Western Ghāṭs. Vestiges of these works, still called 'Ḥaidar's trails', exist near the Kadra Mountains, as well as at Sadaśivagaḍ, Kāravār and Mirajan.⁹⁵ In Kēraḷa, Ṭīpū Sulṭān had a number of routes cleared, linking the capital to this outlying region by way of the Pēriyā, Tāmaraśśēri and Kārkkūr Passes, so as to accelerate the movement of his artillery, and developed a number of roads to the south and south-east of KōLikkōṭu (Calicut).⁹⁶ He was also much concerned about the tracks followed by his soldiers on the eastern border of the plateau, in particular the route from Budikōṭe to Kīruṣṇakīri (Kṛṣṇagiri), which still bears the name '*daṇḍu ṇī*', or military road, as well as the trails in the Hoṣūru *tāluk*, of which certain well-planned sections remain to the north and south of Aṇḇaṭṭi.⁹⁷

Ṭīpū Sulṭān's achievements in this domain have, supported by an overly enthusiastic evaluation, been deemed monumental⁹⁸. The roads which he cleared certainly followed the interfluvies and adroitly avoided the flooded depressions; but, they lacked foundations and basic engineering works and, consequently, did not resist the monsoon rains which caused them to vanish within a few years.

92. J.N. Sarkar, *Mir Jumla*, 156.

93. *Ibid.*, 276.

94. Roe, *Embassy*, 329-42.

95. *Bombay Gazetteer*, vol. XV, *Canara*, part II, 39.

96. Vide *M.D.M., Malabar* (Logan), vol. I, 62-4.

97. Vide *M.D.G., Salem*, vol. I, part I, 294; part II, 108-10.

98. Thus the opinion of a modern author, Kareem (*Kerala*, 163): 'Even if Ṭīpū had not made any other reform in Malabar, his being a pioneer in road-making along will crown him with lasting glory'.

Reality

These efforts ought not to mask the reality: generally the sovereigns limited their activity to those passageways which they themselves utilized. Hence, the royal or military roads benefited from a preferential treatment, whereas others, transversal roads, country roads, depended solely upon the attention which could be given them by the local communities. This solicitude regarding the vital axes of the country was directly related to the strength of the state; the decline of the empire in the eighteenth century had disastrous consequences on the roadways which, in many areas, were abandoned to the caprices of the seasons.

Modave, an astute observer, has left his impressions from the close of the eighteenth century concerning the main roads on the Gangetic Plain:

I shall say regarding the roads that they are scarcely maintained and that they would appear to have been traced by the multitude of travellers, rather than by any attentions on the part of the administration. The country is extremely flat and the soil is sandy, which results in its being very easy to clear the way for a road, but also means that the rains soon efface its traces....⁹⁹

Generally the roads are bad for want of maintenance, as they are never repaired. If in this respect there are exceptions, it is but in the vicinity of large towns or in the states of great princes, who maintain certain roadways and bridges so as to facilitate the passing of their armies.... As the country is for the most part flat and uniform, the multitude of travellers and their vehicles easily trace a route which is then only maintained by successive passage. The rains, which in many places make large fissures, ruin many of the tracks, but the vehicles which one uses are so light-weight that they easily pass everywhere.¹⁰⁰

Roads but slightly entrenched, they could change course simply because they were neglected.

This manner of making roads means that they are not always homogeneous. I had occasion to verify this by comparing the course of my journeys in Indoustan with Tavernier's itineraries. I always found myself at several coss to the right or the left of these itineraries, which can only be attributed to what I have said regarding the instability of the large roads.¹⁰¹

Even the royal highway from Āgrā to Dehli had changed:

This grand imperial highway which Ekbar had once laid out with such magnificence, so as to communicate easily between Agra and Delhi, and which he had extended on to Lahor, this grand road, I say, which was bordered by trees as are the allées of a park, and alongside which one found from coss to coss a milestone and a masonried well, this road no

99. Modave, *Voyage en Inde*, 321.

100. *Ibid.*, 322.

101. *Ibid.*, 322.

longer was. A few of these columns are still seen, which serve to indicate that this magnificent road had followed a different route than that which today leads from Agra to Delhi....¹⁰²

These were the roads lacking genuine foundations and without fixed course, exposed to all the vicissitudes of nature and man, which the English *Company* inherited as it set out to fashion the Indian Empire.

Thus concluding with the roadways, the questions regarding the crossing of rivers, in particular the subject of bridges, must now be considered.

102. *Ibid.*, 321. Same observation in Heber, *Narrative*, vol. II, 324.

2. River Crossing

If but relative importance was attached to permanent road construction, one was, on the other hand, very concerned with the crossing of rivers, which often represented formidable obstacles to land communications.¹ They could not be easily traversed owing to the width of their beds, which, in the period of shallow waters, consist to a great extent of large sandbanks or concatenations of marshes; and then, when in spate, are swollen with a great volume of rapidly flowing water.² Furious leviathans which overflow their banks at high-water, the rivers withdraw to the centre of their ancient beds over long months, moving currents only at the time of the rains.

These are the images which should be kept in mind when considering the river charts upon which a simple line represents the average breadth of 2 km,³ and from which the greater number of minor tributaries have been omitted; affluents which nevertheless might well have immobilized armies and influenced the course of historical events. These constraints were, in regard to communication lines, particularly rigorous on the west coast, a region very much watered and furrowed by rivers, as well as on the large deltas, where the rivers form an inextricable mesh of distributaries, separated by alluvial folds. Circum-

1. They could also serve as lines of communication, and the significant role which they played in interrelation and exchange will be considered in volume II.

2. During the high-water period, most of the water-courses were impassable. According to Tavernier (*Travels*, vol. I, 59), it was necessary to wait two months to traverse the Sābarmatī, to the north-west of Aḥmadābād. Modave (*Voyage*, 492-3) noted on 8 and 9 August 1776, in the south-east of the old State of Jaypur: 'There is a rather large river some half-coss from Bambori flowing in a deep ravine whose banks appear to be slate. Two of my camels remained on the other side of the river, the load of one having been left near the bank. The river rose during the night and carried it away.... The 14th we set off... to advance along the bank of the Tchambel (*Cambal*) in the hope of crossing it immediately. However, the waters were too high and the ferrymen dared not risk the crossing. That night we stayed on the right bank. We were shown a spot in the river bed where the water made an eddy, and were told that it was the tip of an extremely elevated rock which was thus inundated and that it would have to be entirely uncovered before the passage could be risked'.

3. Several figures can be gleaned from the *East India Gazetteer* by W. Hamilton (vol. I, 557, 583; vol. II, 162): the Gaṅgā is only fordable at some spots upriver from Ilāhābād, and its main bed at low-water periods varies from 400 yards to 1¼ miles, an average of ¾ mile (somewhat more than one kilometre); the Godāvarī, before reaching the delta, has about 1½ mile's breadth (nearly 2½ km); finally, the Mahānadī, at Sambalpur, has during the rains a width of almost one mile, while at Kaṭak it is two miles.

stances being such, one understands that the fords and ferrying places have everywhere attracted the roads.

These convenient crossings are expedient points which effect a concentration of the transport lines. Their study is of considerable interest. Allchin,⁴ analysing the history of a ford on the Kṛṣṇā in the *doāb* of Rāyācūru from antiquity down to the present, has elucidated the significance of this *saṅgam* which was linked with cults having their origins in the protohistoric period. One has seen (*supra*, 31, 60-61) the exceptional destiny of the fords and ferries of Uṇḍ and Aṭak on the Indus, of Maheśvar and Akbarpur on the Narmadā. Many designations for modern localities have conserved the memory of these passages and it is probable that the study of place-names would provide much historical clarification.⁵

Fords

Fording places have everywhere been determining factors in the orientation of communication lines and, with them, of human settlements. Most of the streams and the upper courses of the large rivers⁶ were during the dry season crossed by way of fords, which thus were important elements in interrelation and exchange and, especially during times of war, assumed strategic roles of primary significance.⁷ Generally, they do not seem to have been developed and it was necessary in order to traverse the watercourse to proceed along alluvial folds, areas of sand and gravel, which retarded progress.⁸ On the other hand, along

4. Allchin, 'The Archaeology of a River Crossing' in *Indian Anthropology Essays*, 1962, 52-65.

5. The examination of a large-scale map of the riparian regions of the Gaṅgā is instructive in this regard. One finds there the suffix *ghāṭ* (quai, ford, ferry) in many of the place-names. Modave (*Voyage*, 186-7) had already noted at the close of the eighteenth century: 'Throughout India one names "gat" or "gate" all the places where the convenience of boats, fords and the accessibility of shores facilitate the river crossings'. In Tamil country, particularly in the Tañcāvūr district, which is furrowed with fordable streams, the suffix *tuRai* is often found; for example TuRaiyūr, 'fording town', or TirupāltuRai, 'ford of sacred milk', near Śrīraṅkam (vide Braufill, 'On the Names of Places in Tanjore', *M.J.L.S.*, 1879, 74).

6. Srivastava (*Shuja-ud-daulah*, vol. II, f.p. 413) has indicated the places where the Gaṅgā could be forded during the dry season; his map has been reproduced in Modave, *Voyage*, 148.

7. In 1658, Dārā, at the announcement of the arrival of Aurangzeb's troops, seized all the fords on the Cambal in the vicinity of Dholpur (Sarkar, *Hist. of Aurangzeb*, vol. I and vol. II, 233). The Marathas took care during their military campaigns to implant bamboo stems in the riverbeds, thus indicating the fords which they could eventually utilize in case of retreat (Irvine, *Army*, 212).

8. Jacquemont (*Découverte*, 78) describes the crossing of the Son River in Bihār during the middle of the dry season, 25 December, 1829: 'It is a sea of sand

the rocky sills of the Deccan rivers the protrusions were levelled and the holes filled with stones, constituting solid foundations. The remains of a paved ford have been found on the Kṛṣṇā, downstream from its confluence with the Bhīmā;⁹ and, according to inscriptions, fourteenth century princes were said to have flagged certain passages at Vijayanagara on the Tuṅgabhadrā.¹⁰ But the most original work in this domain was achieved at the beginning of the seventeenth century by RāmappaiyaN, Tirumalai NāyakkaN's general, who developed a passage on blocks of rock in the PāmbaN Channel, vestiges of which can still be seen in the water,¹¹ so as to facilitate the movement of troops to Rāmēśvaram.

Ferrying Points

On the rivers swollen by the rains and non-fordable streams, travel could not escape the contingency of transference and had necessarily to take recourse to ferries, the importance of which is attested since antiquity.¹²

The types of craft¹³ employed varied from region to region: other than inflated skins in the north-west, coracles or basket-boats to the south of the Kṛṣṇā, there were dugouts arranged pairwise and connected by a platform, diverse rafts and planked craft in the great alluvial plains to the north of the Kṛṣṇā. Everywhere, during the Muslim period, as during the Hindu period,¹⁴ their use was strictly regulated by the authorities.

In the second half of the eighteenth century this department functioned well in those provinces which were regularly administered. In Oṛiṣā, for example, where the Maratha government strictly controlled

having a breadth of not less than one league; and my waggons took four hours to cross. To animate this desert, Providence held in reserve two elephants and some thirty camels which slowly defiled counter to my caravan.' Vide also Mundy's account (*Travels*, vol. II, 133) who in September 1632 traversed at the same place, and had to, moreover, use several boats.

9. Allchin, *Indian Anthropology Essays*, 53.

10. *Annual Reports on Indian Epigraphy for 1958-9*, 94, App. B, 632.

11. This type of paved ford, called *RāmappaiyaNaṇai* (or RāmappaiyaN causeway) was made in 1638 (*M.G.*, 744; *M.D.G.*, *Ramanathapuram* (1972), 81, 945).

12. One finds references to them since the Buddhist period, when they were known under the name *nāvā-titha* (*Jātaka*, III, 330); Pāṇini (IV,4,91) termed them *nāvya* (Agrawala, *Panini*, 156).

13. These shall be considered in the chapter dealing with river craft (volume II).

14. It is significant to note that the meticulous regulations concerning the organization of ferries and the payment of passage which the *Arthaśāstra* (bk. II, 28) lists, do not differ from those enumerated in *Ā'in-i-Akbari* (vol. I, 291-2).

the boatmen, it was remarkably organized: the state accorded *jāgīr*¹⁵ to ferrymen, in recompense of which they were committed to place their own boats at the disposition of the public, to convey gratis troops and functionaries and were expected to accept reasonable fees for the passage of travellers and their goods. Should these men not fulfill their obligations, their lands were withdrawn from them. Very well adapted to local conditions,¹⁶ this system seems to have been in usage in other regions governed by the Marathas,¹⁷ as well as in the Mughal dependencies; however, in eastern India, which was in a transitional period subsequent to the decline of the central power, this public service had passed into the hands of private individuals, who in many cases instituted a reign of the arbitrary.¹⁸ Still today, certain tribes in Nepāl are specialized in ferriage.¹⁹ Interrelation could scarcely elude a depen-

15. *Jāgīr*: land granted by way of recompense, the revenue of which served as pension for the holder. The extent of the lands was dependent upon the importance of the function. Hence, for the ferry on the Mahānadi the ferryman received 12 *bāṭi* or 200 *bighā* of terrain; for that on the Kāthjūrī, 10 *bāṭi* or only 167 *bighā* (*Board's Collection*, No. 14 178, 239-41 (ms.), cited by Ray, *Orissa under the Marathas*, 138-9).

16. 'Under the grants thus assigned by the Maratha Government', noted an English judge, E. Watson, 'the ferries flourished by far the best I ever saw in any part of India, they were decked and capable of carrying several elephants, carriages and palanquins together; they must have been built at a considerable cost and kept up at a very great expense. All the purpose of a ferry as a common highway was assured under this arrangement' (*ibid.*).

17. As Modave stated (*Voyage*, 505) when he crossed the Narmadā at Maheśvar, Ahalyā Bāī's capital: 'His Lord's boats are sufficiently large to convey at least two hundred people at one time and two elephants. There are at least thirty such vessels. The passage is exceedingly easy and well maintained for the use of travellers'.

18. In the districts of Bihār, Gorakhpur, Dinājpur and Purniyā, which Buchanan visited (Martin, *Eastern India*, vol. I, 387; vol. II, 579, 1018; vol. III, 350), the ferries were dependencies of large riparian proprietors which they entrusted to the ferrymen, who also sometimes received land for this work. Generally, they demanded exorbitant sums of travellers, which were then shared with their patrons.

19. 'The *mājhī* (or *boṭe*) are to be found along the entire length of Nepāl, on the plain as well as in the mountains: they are ferrymen, and number less than 6,000. They enable, where there is no bridge, the crossing of the rivers in monoxylons, which they themselves make by cutting and hollowing out tree trunks. These dugouts can hold from 5 to 10 people; a single ferryman operates them by means of an oar. Setting out, he vigorously launches his craft in upriver direction and rows to reach mid-stream, but it is soon taken by the current and diverted downstream before reaching the opposite shore. Before setting out, the passengers quite judiciously implored the protection of the water goddess, throwing several small coins into the stream; for if the dugout should capsize, only the ferryman, who alone knows to swim, could save himself. At all important points of passage, the *mājhī* have been installed by the government in densely built-up villages. They

dency on fords and ferries as, except in the Himālaya, boat bridges, wooden or masonry bridges, temporary or more permanent engineering works, were still the exception.

Boat Bridges

One remembers the *elephant-bridge* of the ingenious CōLa king Rājendra, who had his soldiers to pass over the backs of the noble pachyderms, which had been aligned across the watercourses.²⁰ But one could not avail of this original procedure in the case of deep rivers, and it would not seem to have been adopted by Indian strategists. In North India, the boat bridges appeared at an early date as the most certain and rapid means to traverse the waterways. Alexander, according to Arrian,²¹ would have made use of one in order to cross the Indus; and Kalhaṇa²² records that in Kaśmīr, the first large bridge on the Vitastā or Jhelam, erected in the second half of the sixth century of our era, was a work of this type. On the Indo-Gangetic plain, military leaders generally took recourse to these constructions to facilitate the passage of their troops,²³ as Bernier relates:

So as to cross the large rivers, which in these regions ordinarily do not have bridges, two were made of boats, separated by some two or three hundred paces from each other; they know tolerably well to link and strengthen them, and they cover them with a mixture of earth and straw, thus preventing that the animals easily slip.²⁴

enjoy tax-exempt lands in compensation of services rendered; they are obliged to be on duty throughout the year, to maintain the dugouts and to cross gratis soldiers and functionaries in service, the other passengers having to pay a slight fee' (Gaborieau, *Népal*, 87).

20. Nilakanta Sastri, *Cōlas*, 206

21. Arrian, *Anabasis*, bk. V, chpt. VII.

22. Stein, transl. of the *Rājatarāṅgiṇī*, vol. I, 103 n. 354.

23. Boat bridges were erected on the Indus by Tīmūr in 1398 (Elliot, *History of India*, vol. III, 484); by Akbar, under the supervision of Qāsim Khān, in 1581 (Monseratte, *Mongolicae*, 156); by Jahāngīr in 1607 (*Tūzuk*, vol. I, 101). In 1528, Mīr Muḥammad constructed near to Kanauj within 12 days a structure of this type on the Gaṅgā for Bābur's troops (*Bābur-nāma*, vol. II, 599). In Gujarāt, in 1618, under the reign of Jahāngīr, Khvājah Abū'l Ḥasan raised within three days on the Mahī a bridge having a length of 140 yards which did not move under the weight of an elephant sent by the emperor to test its stability (*Tūzuk*, vol. II, 41).

24. Bernier, *Voyages*, t. II, 228-9. He adds that the army's passage was not made without difficulty and was the object of strict surveillance: 'The greatest confusion and danger occur at the extremities; for not only does the crowd and pressure occur most there but when the approaches to the bridge are composed of soft moving earth, they become so broken up and so full of pits, that horses and laden oxen tumble upon one another into them, and the people pass over the struggling animals in the utmost disorder. The evil would be much increased if the

This technique was not without fault: rather than utilizing grapnels to anchor the boats, much time was lost driving piles into the riverbed; thus a work which might have been executed within one day, required from eight to ten days and offered ultimately but little security.²⁵

We owe to an English engineer the description and plan of the boat bridges assembled by the *Sikh* across the Satlaj. They connected the local craft (*cappū*), held by a wooden anchor charged with rocks, by alternately juxtaposing stern and prow, as shown in Fig. XV. Then, generally, they sufficed to fill the boats with branches covered with earth. In the case of a more elaborate construction, a manner of trestle was raised in the centre of each vessel, upon which were mounted three or four solid beams, connected by means of a series of transversal pieces, and the entire structure was then topped with scrub and earth. Works of this type were able to support very heavy weights (elephants, cannons), but the least change in water-level could have had dire consequences.²⁶

This procedure was usually practised on the large rivers in Hindusthān, but it does not appear to have been employed in the south of the peninsula.²⁷ In any case, these bridges erected by sappers were temporary structures which were dismantled subsequent to the passage of the troops. Nevertheless, on heavily travelled routes, an attempt was made to maintain these works at certain strategic points during at least part of the year.²⁸

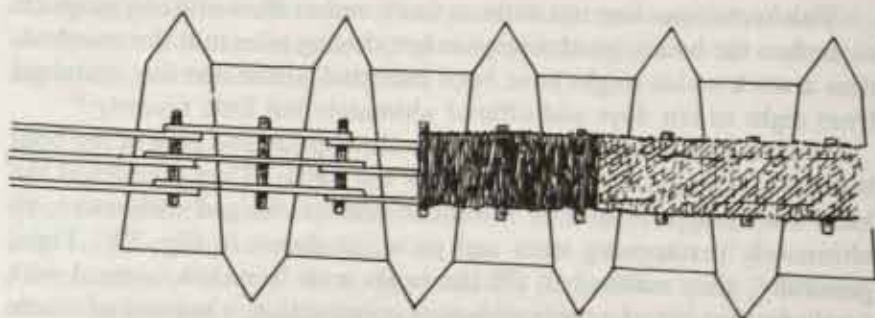
army were under the necessity of crossing in one day; but the King generally fixes his camp about half a league from the bridges of boats, and suffers a day or two to elapse ere he passes to the opposite side of the river; then, pitching his tents within half a league from the bank, he again delays his departure so as to allow the army three days and nights at least to effect the passage' (*ibid.*, 229). Monserrate (*Mongolicae*, 81) specifies that during Akbar's reign, the different corps of troops had to cross separately and in single file so as to limit the load, which could have caused the bridge to collapse, that it was forbidden to cross elephants, and that to watch over the execution of orders, officers of the emperor were posted at the entrance of the bridges and controlled the operations.

25. Observation made by Major Roberts, in *Asiatic Miscellany*, vol. I, 1788, 419, cited by Irvine (*Army*, 212). Two miniatures of the *Akbar-nāmah* (of the London Victoria and Albert Museum, pls. 21-2) represent a boat bridge of this type (reproduced in Hambly Gavin, *Cities*, 43; *Lalit Kalā*, No. 10, October 1961, pl. IV, fig. 9).

26. Captain Yule, 'Some Accounts of the Passage of the Sutlej by the British Army in February 1846' in *Papers on Subjects connected with the Duties of the Corps of Royal Engineers*, vol. X, 1849, 177.

27. To traverse the streams south of the Kṛṣṇā, the armies usually made use of coracles or basket-boats (vide among others, Briggs, *History of the Rise*, vol. II, 22; Paes, in Sewell, *Forgotten Empire*, 250; Moor, *Narrative*, 122).

28. In Jaunpur at the time of the Śarqī kings (end of the fourteenth century) there was on the Gomati a boat bridge which was later to be replaced in Akbar's



XV. Boat bridge on the Satlaj, beginning of the nineteenth century (drawing by Captain Yule, in *Papers on Subjects connected with the Duties of the Corps of Royal Engineers*, vol. X, 1849, pl. 10, fig. 3).

The best known example is that at Aṭak, which commands the Kābul route. There the bed of the Indus narrows between the hills and has a breadth of only some 300 metres, but the water-level is not constant: in the summer when the snow melts it can of a sudden rise to some fifteen metres, having a very turbulent current. It was therefore not possible to anchor a boat bridge throughout the year. At the time of Ranjīt Singh, this structure was in service for seven or eight months of the year; it was erected at the conclusion of the high-water period, somewhat upstream from the fortress, and was then in the spring installed downstream, to remain there until the rising of the river. The *qil'ahdār* of Aṭak and the *nāẓim* of Peśāvar were charged with the responsibility of its surveillance and maintenance.²⁹ At that time, one could scarcely have done more. This river posed great problems for the English engineers who, after the vain attempt to dig a tunnel in 1859, were only in 1883 able to complete the large Indus bridge.³⁰ Moreover, prior to the introduction of western techniques to India, permanent bridges³¹ played no important role, other than in the Himālaya.

era by a stone bridge (C.S.R., vol. XI, 1875-6, 120-3).

29. Shahamat Ali, *The Sikhs and the Afghans*, 1847, 177. Burnes relates that, to be able to erect bridges over the Indus, Ranjīt Singh maintained at Aṭak a fleet of 37 boats, of which 24 were utilized near the fortress, but at other points where the river was wider all of them were used. The boats were deployed at a short distance from one another and were linked by way of earth-covered planks; and, so as to prevent the structure from being washed away by the current, each boat was anchored in the river by means of four or six cables to which had been attached wooden boxes filled with stones and weighing each 250 *man*. Such a bridge could be constructed within three days, generally however required six days (*Foreign Department Miscellaneous Consultations*, No. 269 (1831), 139, cited by Bajwa, *Military System of the Sikhs*, 208 n. 1).

30. MacGeorge, *Ways and Works*, 87-9, 382-9.

31. We have previously treated this question in our study *The Ancient Bridges*

Himālayan Bridges

The torrents of the Himālaya during the fair weather season (the only period during which long-distance travel would be feasible) can be forded only with difficulty because of the turbulence of the current and the very low water temperatures.³² They cannot always be traversed with the crude rafts precariously assembled by the inhabitants;³³ and the valleys, which are cluses at the height of rejuvenation, form in many places abrupt and impassable gorges. Therefore, in frequent cases, a bridge represents the only means to enable exchange and communications. The mountain peoples have adapted themselves remarkably well to the prevailing conditions by building in a manner at once simple and audacious various structures corresponding to the different materials available and the diverse methods employed, which are precisely distinguished in the local dialects. A judicious observer might well read in these constructions the characteristics specific to the Himālayan regions.³⁴ We can classify them in two categories: suspension bridges (made of rope, cane, iron chains), beam and cantilever bridges of wood.

Suspension Bridges: V and U-section, Cableways

There was, to begin with, an entire range of structures made of locally available raw materials: ropes consisting of fibrous twigs or animal fibres in the western mountains, rattan and bamboo in the eastern massifs.³⁵ Throughout the length of the mountain chain these materials were utilised according to two basic principles: they could be used as footpath and hand-rails, or as a stout cable along which a wooden piece is hauled by means of a rope. In whichever case, the structures were fastened on the banks, either to an anchorage block consisting of piled

of India, which is to be considered as an appendix to the present work. The reader is referred to the aforementioned study, where the technical problems are discussed in detail.

32. The waters are very cold, even in summer, and it is hazardous to venture into the river to above waist-depth, which can be done without the slightest risk in any of the watercourses on the plains.

33. We shall consider them in volume II, the chapter treating of river craft.

34. There is no dearth of information concerning these structures. They are at times mentioned in the local chronicles or in the Mughal annals, as well as having been described by European travellers having visited the Himālaya from the period of Bernier and the Tibetan missionaries (seventeenth century) down to the present.

35. Vide, among others, Thomson, *Western Himalaya*, 242; Baden-Powell, *Handbook*, 334-5; Gerard, *Koonawur*, 33; Traill, *Kamaon*, 143; Hooker, *Himalayan Journals*, vol. I, 149-50; Yule, *Notes*, 613-4, which is complemented by Watt, *Commercial Products*, 131, 115, 694, 930, 201-2, 98-112.

rocks, to an assembled framework, or to the trunks of trees. Bernier was one of the first Europeans to have mentioned that there were 'very difficult passages and very rapid torrents over which one crosses on ropes stretched from one rock to another'.³⁶

The V and U-section suspension bridge, generally termed *jhulā* in the west of Nepāl, and *jalūnga* in Sikkim, consisted of three cables made of leather thongs arranged in a V or U-shape, upheld by means of solid supports, forked at the ends, in Kaśmīr, by large intertwined ropes in the Pañjāb, rattan and bamboo stems gathered together in a skein in Sikkim, which could be assembled to form a cradle in the mountains of Āsām, or linked by large rattan rings ("tubular" bridges) on the Burmese borders³⁷ (vide Fig. XVI, a, b, d.).

The cableway, known by the term *chūnkā* in the western Himālaya, was formed of a support cable upon which moved a piece of wood (hollowed log equipped with ropes, basket, cradle, seat, cane ring) linked with a traction cable which was operated by hand from either side of the river³⁸ (vide Fig. XVI, c.).

To these structures should be added the iron chains suspension bridge, found principally in Bhūṭān and Nepāl.³⁹

These constructions, the length of which usually varied from 30 to 100 metres,⁴⁰ were erected at diverse points on most of the Himālayan rivers, enabling the passage of men and facilitating the communication between settlements separated by impassable watercourses for the greater part of the year.

They nevertheless had serious drawbacks: other than their exacting utilization (one must not have been subject to vertigo!), they bore but a limited load and in general were not accessible to animals.⁴¹ The bridge constructed of wooden beams represented in this respect a distinct progress.

Wooden Beam and Cantilever Bridges

The flanks of the Himālaya are covered with forest, wherein excellent

36. Bernier, *Voyages*, t. II, 293-4.

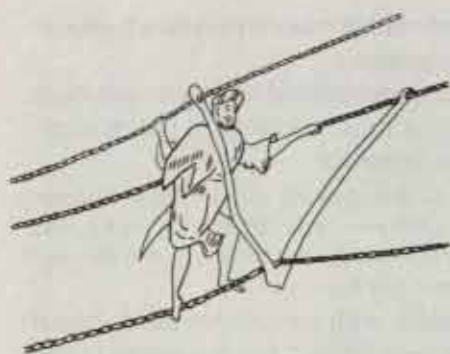
37. Vide *Tūzuk*, vol. II, 137; Bernier, *Voyages*, t. II, 293-4; Vigne, *Travels*, vol. I, 199; Drew, *Northern Barrier*, 84-5; Cunningham, *Ladāk*, 170; Hugel, *Travels*, 175-6; Traill, *Kamaon*, 142; Hooker, *Himalayan Journals*, vol. I, 49, 50, 152, 297, 33-4; vol. II, 30-2, 100, 269; Hamilton, *Nepal*, 274; Yule, *Notes*, 613-4.

38. Cerard, *Koonawur*, 33-4; Forster, *Journey*, vol. I, 301; Vigne, *Travels*, vol. I, 199; Traill, *Kamaon*, 143; Bogle, *Mission*, 22; Turner, *Embassy*, 54, 191.

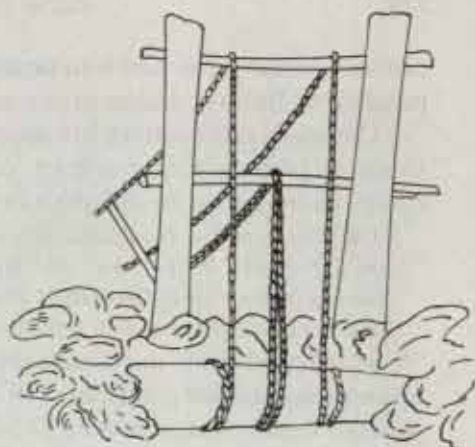
39. Père Georgi, *Alphabetum tibetanum*, 1762, cited by S. Lévi, *Nepal*, t. I, 127; Bogle, *Mission*, 21; Turner, *Embassy*, 54-5, 191; Hooker, *Himalayan Journals*, vol. I, 197-9.

40. Vide our *Ancient Bridges of India*.

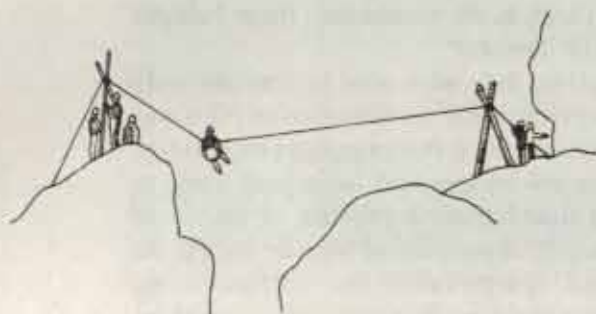
41. Drew, *Northern Barriers*, 85; Vigne, *Travels*, 217; Temple, *Journals*, vol. II, 202; Traill, *Kamaon*, 142.



a.



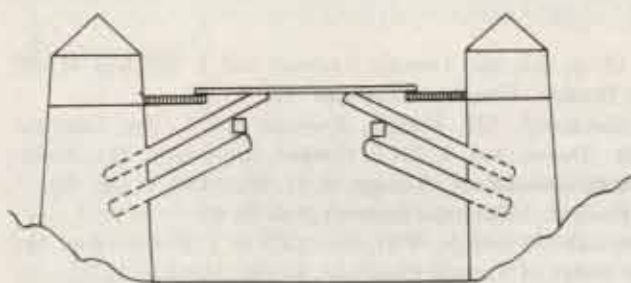
b.



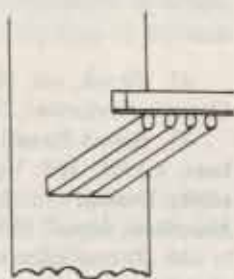
c.



d.



e.



XVI. Himālayan bridges, based upon earlier drawings: a. and b., *jhūla* at Dopattā on the Jhelam in October 1847 (sketch by R.G. Taylor, *Political Diaries*, vol. VI, f. p. 104); c., cableway in Bhūṭān (drawing by Daniell, *Orient. Annual*, 1837, f. p. 9); d., *jalunga* in Sikkim in 1848 (drawing by Hooker, *Himal. Journals*, vol. 149); e., *saiga* in the Pañjāb (sketch by Baden Powell, *Handbook*, 333).

timber (*deodār*, *śīśū*, *sāl*) is to be found, which was employed whenever possible to link the banks of the watercourses.

The most rudimentary bridges were constructed simply of bamboo stems or of several tree trunks, such as those located on the Kaśmīr route, as described by Jahāngīr in his memoirs:

The way in which they make bridges in this country is to throw pine-trees on the surface of the water and fasten the two ends strongly to rocks, and having thrown on to these thick planks of wood, make them firm with pegs and ropes, and these with a little repair last for years.⁴²

More solid were the structures made, with or without piles, based upon the *cantilever* principle. The simpler types,⁴³ termed *saṅga* in the western mountains, consisted of beams affixed into solid abutments on the riverbanks and arranged in successive cantilevers (vide Fig. XVI, e.). Located throughout the length of the mountain chain, they reflect in detail the local conditions; as thus in Bhūṭān, country of great lamaseries and massive castles set high in the mountains, these bridges were fortified and embellished with towers.⁴⁴

Having a span of 20 to 40 metres, they were able to traverse only torrents of average breadth.⁴⁵ Everywhere the construction of piles was avoided, as they posed great problems; with the exception of Kaśmīr, where, on the Jhelam, many-spanned bridges had been built since at least the fifteenth century.⁴⁶ On foundations consisting of piles and blocks of rock, trusses were erected, composed of *deodār* trunks on successive courses and arranged horizontally, the surface being progressively augmented until the opening between piers could be spanned with a platform.⁴⁷ These remarkable structures (*kadal*), solid and supple, could bear considerable loads, and some were even bordered with shops.⁴⁸

42. *Tūzūk*, vol. II, 127-8; vide also Temple, *Journals*, vol. I, 297; vol. II, 21; Gerard, *Koonawur*, 36; Hooker, *Himalayan Journals*, vol. I, 333.

43. Baden-Powell, *Handbook*, 333; Temple, *Journals*, vol. I, 296; Cunningham, *Ladāk*, 168; Vigne, *Travels*, vol. I, 201-2; Gerard, *Koonawur*, 221; Moorcroft, *Travels*, vol. I, 166; Jacquemont, *Voyage*, t. II, 68; *Atlas*, I, 26, fig. 7; Hamilton, *Nepal*, 274; Hooker, *Himalayan Journals*, vol. II, 43.

44. Turner (*Embassy*, 132-49 and pl. VIII, f.p. 132) in 1783 described and sketched the celebrated bridge of Vaṅgdū Phodraṅg; Bogle, *Mission*, 21.

45. Gerard, *Koonawur*, 35-6; Jacquemont, *Voyage*, t. II, 66; Vigne, *Travels*, vol. I, 201; Bogle, *Mission*, 21; Turner, *Embassy*, 132-3.

46. Only boat bridges were known under the Hindu sovereigns (Stein, *Rājatarāṅgiṇī*, transl. vol. I, 103, 388); many-spanned bridges appeared at the time of the Sultans (Hasan, *Kashmir*, 47, 94, 99, 271; Bates, *Gazetteer*, 357). Jahāngīr (*Tūzūk*, vol. II, 142) and Bernier (*Travels*, 398) mention several.

47. Moorcroft, *Travels*, vol. II, 122-3; Hugel, *Travels*, 117; Temple, *Journals*, vol. I, 296; Baden Powell, *Handbook*, 335-6.

48. Moorcroft, *Travels*, vol. II, 122-3; Bellew, *Kashmir*, 56.

Himālayan Bridges and General Communications

Thus, whether temporary or permanent, these bridges of rope or rattan, of chains or wood each year during the fair weather season furthered interchange at recognized points in the mountain range. Indispensable links, they enabled man's movement through the great valleys and connected the Indian slopes with the Tibetan plateau, ensuring a continuity along the Himālayan tracks. The imperial highway from Kāsmīr was especially favoured in this respect.⁴⁹ In the nineteenth century Śrīnagar, the Venice of India, one counted seven large *kadal*, having approximate lengths of 90 metres spanning the stream, and eighteen bridges constructed of wood or stone over the canals.⁵⁰ Furthermore, other than in the capital city, there were six other *kadal* on the Jhelam, between Khanabal and Bārāmūlā, each of some hundred-metres' length,⁵¹ and downstream, several *jhūlā*.⁵² Nowhere else in the Himālaya or on the Indian plain were there such structures as these testifying to the enterprising spirit of the Kāsmīrī craftsmen.

Stone and Brick Bridges⁵³

In the great alluvial plains or on the plateaux of the peninsula, the question was framed in a different context: the ferries ensured the crossing of streams and large rivers; the fords sufficed to cross water-courses of shallow depth. The construction of permanent structures raised technical problems which could neither be surmised nor resolved (variation in rate of flow, divagation of river course, regularisation of the fluvial beds, etc.), and demanded an abundance of raw materials (wood, rock or brick) not always to be found in situ. For these reasons, there was no endeavour to erect *pakkā* bridges, excepting at certain selected points.

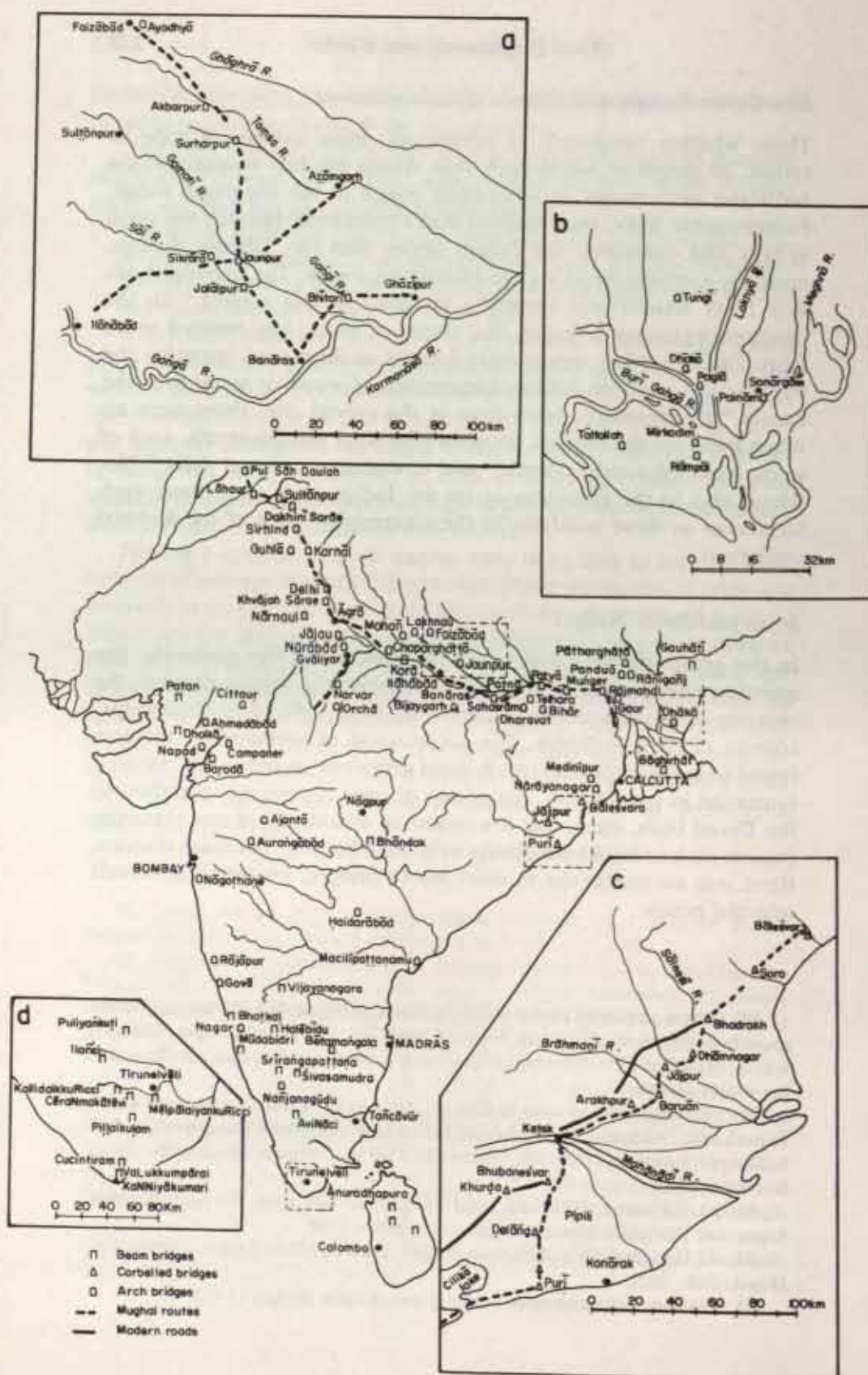
49. Over a stretch of twelve miles, between Bahrāmgala and Puṣiyānā on the route from Bhīmbar to Śrīnagar, Vigne (*Travels*, vol. I, 259) and Temple (*Journals*, vol. II, 21) noted 25 to 30 beam bridges which were repaired annually at the end of the winter season.

50. The large bridges were as follows: Amīr kadal, Habbā kadal, Fath kadal, Zaina kadal, 'Alī kadal, Nau kadal and Saffa kadal (vide Bates, *Gazetteer*, 218, 357-9; Temple, *Journals*, vol. I, 290, where also a list of structures spanning the canals is to be found).

51. At Khanabal, Bījbehāra, and Pāmpur upriver from Śrīnagar, Sumbal, Sopur and Bārāmūlā downriver (Bates, *Gazetteer*, 218).

52. At Ūrī, Dopattā and Haṭiyān (Hugel, *Travels*, 175-6; Taylor, *Diaries*, 104; Hugel, *ibid.*, 182).

53. We have reviewed these works in our *Ancient Bridges* (1-49).



XVII. Map of ancient stone and brick bridges.

Ancient literature does not make mention of the construction of permanent structures over the watercourses, other than the legendary *Rāmaṣetu*.⁵⁴ Nonetheless, one knows of their existence over moats and at the entrances to fortified cities:⁵⁵ simple roadways of wood which were probably also built over small rivers⁵⁶ and which then would have served as paradigms to the architects constructing the first stonework bridges.

Technical Characteristics

Among those specimens which have come down to us, some of which go back to the ninth century A.D., we can distinguish between stone beam bridges and arch bridges.

There is, first of all, a category of bridges constructed of stone slabs resting on supports of diverse types: square stone pillars set in rocky beds⁵⁸ of the peninsular rivers, such as the Kāveri or the Tuṅgabhadra; columns deployed on granite bases in Āsām;⁵⁹ massive piers of hewn stone on some rivers in the Deccan;⁶⁰ or the corbel vaulting bridges in

54. *Setu* (Skt.), earthen embankment, dyke, bridge; *Rāmaṣetu*, between Rāmēśvaram and Śrī Laṅkā (Ceylon), constructed for Rāma by the monkey Nala. Should this celebrated episode in the *Rāmāyaṇa* correspond to an historical event, it could only refer to the building of a dyke or of a stone embankment.

55. In excavations made in Paṭṇā at the sites of moats, masonry piers were uncovered as well as remains of the superstructure of a bridge roadway dating from the Mauryan period (A.R.B., 393-6).

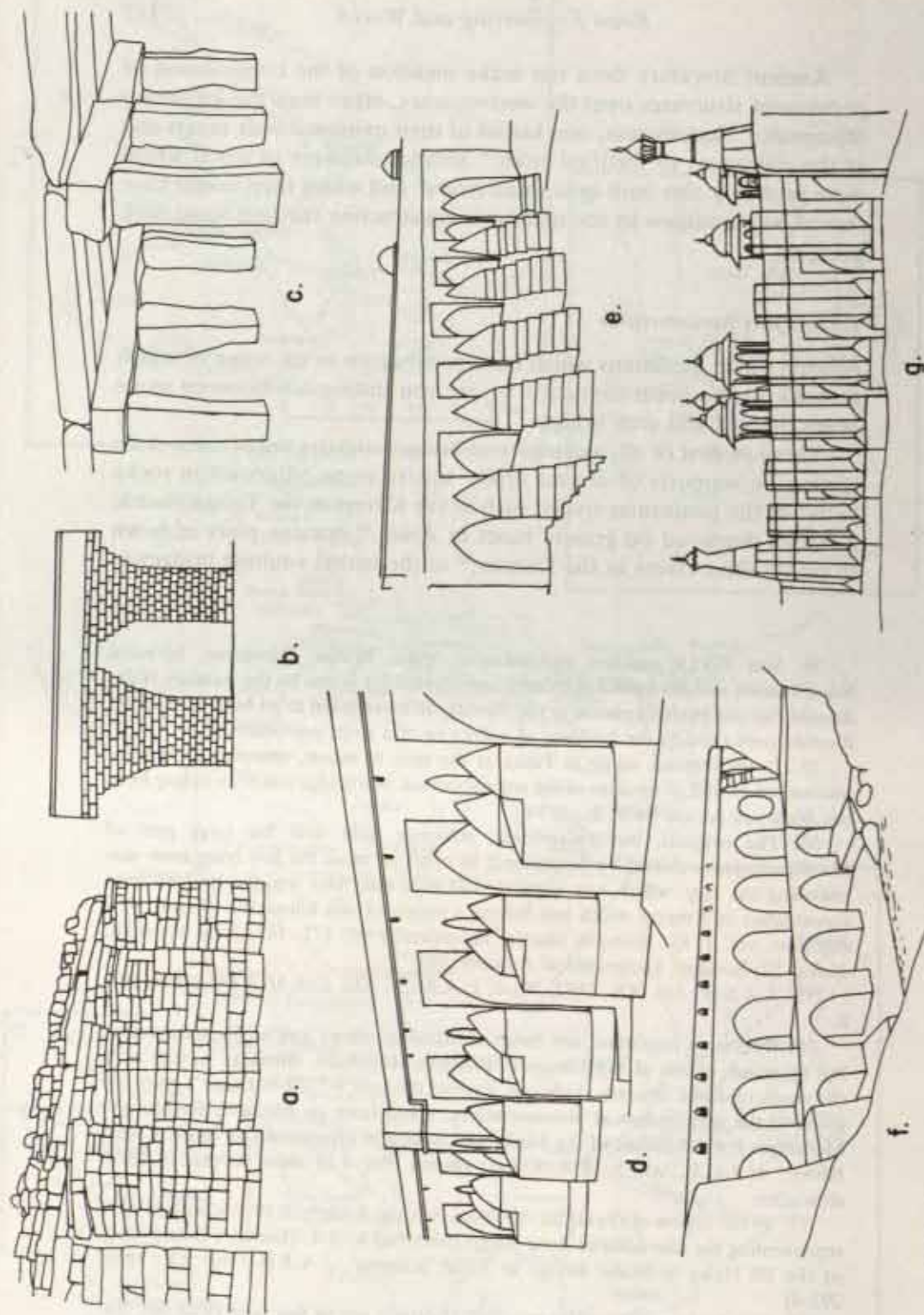
56. The original, but exceptional, structure built near the large port of Macilapaṭṭaṇamu should be mentioned: in order to cross the low-lying zone surrounding the city, which was inundated at high-tide, two wooden bridges were constructed of 5 metre width and having a length of two kilometres (Fryer, *New Account*, vol. I, 81; François Martin, *Mémoires*, t. II, 177, 185; John Marshall, *Notes*, 52; Bowrey, *Geographical Account*, 63).

57. *J.A.S.B.*, vol. XX, 1851, 291-4; *L.A.M.B.*, 532; *L.A.M.B.O.*, 228-9, 297-8.

58. The most important are those at Śrīraṅgaṭṭaṇa and at Śivanasamudra, but there are others at Vijayanagara, Bhaṭkaḷ, Mūḍabidri, Bhaṇḍāk as well as in the south of Tamil country. Vide our *Ancient Bridges*, 4-7, 22-6; figure 2 gives the plans of the two bridges at Śivanasamudra, taken from an article by Rāmasvāmi Mudaliyār ('An Account of the Island and Bridge of Śivasamudram in the Caveri River', *M.J.L.S.*, vol. I, 1834, 83-94); photos Nos 4-14 show several of these structures.

59. In the region of Guvāhāṭī. Vide our *Ancient Bridges*, 8-10, 33-34, and fig. 4 representing the *śīlar sāko* or stone bridge described by S.T. Hannay ('Brief Notice of the Śīl Hāko or Stone Bridge in Zillah Kāmrup', *J.A.S.B.*, vol. XX, 1851, 291-4).

60. The bridges at Vijayanagara and Haḷēbiḍu are of this type (vide our *Ancient Bridges*, 7-8, 24; photos Nos 19-23).



XVIII. Types of stone and brick bridges: a., Vijayanagara, in Karnāṭaka; b., Atharanaḷā, in Oṛiṣā; c., CeraNmakātēvi (Cheranmahādevi), in Tamiḷ country; d., Doṅgri, in Madhya Pradesh; e., Chaparghattā, in Uttar Pradesh; f., Samā, near Vadodarā, in Gujarāt; g., Nūrabād, in Madhya Pradesh.

the coastal plain of Orīṣā⁶¹ (vide Fig. XVIII, c., a., b.).

Others, which are the more numerous, are arch bridges whose forms vary in conformity with the nature of the rivers they span and the prevailing architectural style. The bridges in Baṅgāl and Kaśmīr most generally have humpbacked decks and approaches intended for the passage of boats. Elsewhere are to be seen those, whose arches are but slightly pronounced, while the largest structures have arches of equal height. Many are flanked by towers at their extremities and surmounted by small dome-topped pavilions; some, such as those in Jaunpur, Nūrābād and Narvar, represent veritable works of art⁶² (vide Fig. XVIII, d., e., f., g.). In the alluvial plains the bridges rest upon very solid foundations comprised of a series of brickwork wells; however, their overly massive piles must resist considerable forces when the rivers are in spate: a serious defect which had fatal consequences for a number of them.⁶³

Bridges and Communications

Many of these structures span rivulets, but some afford the possibility to cross rivers, as for instance the Kāvērī or the Gomatī.⁶⁴ The distribution map (Fig. XVII) indicates that several bridges are located in the vicinities of ancient capitals, such as Rāmpāl, Sonārgām and Dhākā; at the entrances to old regional metropolises, as for example Cittaur, Auraṅgābād, Haidarābād, Vijayanagara, Govā; or then, in the proximity of famous pilgrimage places, such as Śrīraṅgaṇa and Śivanasamudra. Others line the Mughal imperial highways: from Āgrā to Kābul in the north-west; from Āgrā to Narvar towards the Deccan; and, from Āgrā to the mid-region of the Gaṅgā. Particularly favoured were the roads radiating around Jaunpur which benefited from Akbar's

61. These works are mentioned by 18th century travellers (Anquetil Duperron, *Zend*, t. I, I, LXX, LXXI, LXXIII, LXXIV; Motte, *O.H.R.J.*, vol. I, 1952, app. II, 8, 11, 12) and by Stirling (*Asiatic Researches*, vol. XV, 1825, 336-8). The most celebrated are the *Atharānālā*, 3 km north-east of Purī, and the *Tentūjimala*, 3 km from Jāipur. Vide our *Ancient Bridges*, 10-11 and 29-30, where a plan of the first will be found (fig. 5); photos Nos 24-26.

62. *Ibid.*, 12-20, 26-8, 31-49 and photos Nos 27-47.

63. *Ibid.*, 15-19. Regarding wells serving as bridge foundations, vide the article by Captain Cautley, 'On the use of Wells etc. in foundations, as practised by the Natives of the Northern Doab', *J.A.S.B.*, vol. VIII, Jan-Dec. 1839, 327-40, with 4 plates of sketches and plans.

64. Lengths of the more important structures; on the Kāvērī at Śivanasamudra, the *Lushington Bridge*: 470 metres; *Rāmasetu*: 300 metres; at Śrīraṅgaṇa, the *Wellesley Bridge*: 420 metres; on the Sindh River at Narvar, the southern bridge: 366 metres, the northern bridge: 300 metres; on the Gomatī at Jaunpur, Akbar's bridge: 190 metres; on the Muśī River at Haidarābād, *Purānā Pul*: 180 metres.

munificence.⁶⁵ It was, however, the main road from Oṛisā (along the course of which twelve bridges have been noted, between Purī and Bāleśvara⁶⁶) which seems to have been the best provided in this regard. Religious considerations explain this solicitude; the Hindu princes, at the behest of whom these structures were erected, probably wished to facilitate the journey of pilgrims from the Gangetic Plain to the sacred city of Jagannātha-Purī. The Muslim princes, such as Śūja' Khān⁶⁷ in the eighteenth century, who in a systematic manner had bridges built between Kaṭak and Murśidābād, continued this work to political ends: so as to render directly accessible an outlying and isolated province.

However, the importance of these structures should not be overestimated; for, except perhaps in the region of Jaunpur and in Oṛisā, they did not play a significant role in interrelation, which remained basically dependent upon fords and ferries.⁶⁸

65. During Akbar's reign, bridges were built at Jaunpur, Akbarpur, Surharpur and Sikrārā, and the Jalālpur bridge was repaired (vide our *Ancient Bridges*, 37, 39, 40).

66. *Ibid.*, 29-31.

67. Motte, *op. cit.*, 8.

68. The problems which river crossing posed for the armies are evoked in a vivid manner by Monserrate (*Mongolicae*, 106-56), who in 1581 followed Akbar's troops across the Pañjāb. Setting out from Sarhind, the emperor abandoned the usual Lāhaur route, and proceeded northwards along the Himālayan border. An itinerary certainly imposed by strategic considerations, but also dictated by technical reasons: to be able to move men and materials in a contact region of plain and mountains, where the rivers were yet fordable and favourable to the construction of bridges. As follows, several of Monserrate's pertinent observations: 'The army camped on the banks of the *Satlaj*; a halt was necessary during which time a wooden bridge was constructed (103).... It (the army) marched for two days along the *Byās* in search of a ford which could be taken by the elephants and for a narrow passage over which a wooden bridge could be constructed. When the scouts had found an appropriate spot, camp was made (104).... The following day, it crossed the *Byās* by means of a wooden bridge.... It traversed the *Rāvi* over a specially built bridge.... The Cingarous River (?) was then crossed at a point very near the foot of the Himālaya (108).... The *Canāb* was traversed with great difficulty, because a bridge could not be erected over the river, and those who attempted to ford it were drowned. The king and several others crossed by boat; the crossing set the army back 3 days, for there were but few boats, even though the king had given command to bring all those available in the surrounding towns and villages (109).... Having reached the bank of the *Jhelam*, Akbar accorded an eight-day rest to his soldiers: during this time a bridge was built over the river, which has a wide and deep bed and was thus not fordable, not even by the elephants (110).... At *Atak*, while the army was camped alongside the Indus, Akbar undertook to win over a *Pathān* tribe, so that they would provide ferries and light water craft to convey the soldiers, as well as timber to erect a bridge. From them he received a large number of beams with which he had more than 40 small boats constructed (122).... Then a great number of boats was prepared to transport the troops, because the river in spate during this great heat precluded the erection of a bridge (124).... Upon his

Forbes, who was well acquainted with the routes of western India, relates that he encountered but a single bridge in the course of his travels.⁶⁹ And Modave, who had visited the heart of the Mughal empire from Baṅgāl to Dehlī (1772-76), gives his impressions as wayfarer:

Although I have travelled throughout the better part of Hindusthān, I do not believe I found even fifteen bridges there, and of those only three or four merit attention.⁷⁰

Main Roads and Rural Tracks

It is therefore not so much the given condition of the roadway or the number of bridges along its course which enable one to distinguish the arterial roads from local tracks. The Indian network formed an immense web, spun by generations of travellers, which in a considerable part of the country, as John Masters wrote,⁷¹ 'did not begin anywhere, and went to everywhere'.

The route thus formed was here a confused tangle of tracks, there a well-laid out roadway; elsewhere it lost itself in rice fields to re-appear only at a forest's edge; at times it led to a forgotten temple and terminated there; a badly provided track at the approach to a city, it could have been a beautiful straight avenue in a modest village: its condition was dependent upon the attention it received from the local authorities.

Into this moving fabric of rural ways, which remain for us anonymous, were woven threads, scarcely larger, but which had a relative stability, as they were subject to an organization reflecting political and economic imperatives. The route of the sovereigns and the merchants was a dynamic pattern of greater complexity, adapted to long-distance travel. It was generally bordered with trees, sometimes punctuated by milestones and, above all, it was systematically endowed with, at regular intervals, travellers' rest-houses and water sources.

Organization of the Communication Lines

This organization of the routes is in fact very ancient. Since the Vedic age⁷² in India, one discovers on the part of sovereigns or other indi-

return from Kābul (in September), Akbar had a bridge erected over the Indus (156)...'

69. J. Forbes, *Oriental Memoirs*, vol. II, 287.

70. Modave, *Voyage en Inde*, 322.

71. John Masters, *The Deceivers*, 10.

72. Vide S. C. Sarkar, *Some Aspects of the Earliest Social History of India*, 13-5.

viduals the concern to facilitate the movement of men. The seventh Aśokan pillar-edict is in this regard significant. It specifies that the emperor commanded the planting of trees along the roads, that wells were to be dug and rest-houses constructed at every eight *krośa*.⁷³ His successors pursued this work. Hsüan-tsang⁷⁴ relates that there were in the Gangetic Plain of the seventh century 'a multitude of charitable houses called *puṇyaśālā* where the poor and the unfortunate were assisted by the distribution of medicine and food', and that thus 'the wayfarers never found themselves in difficult straits'. These benevolent foundations were generally patronised by the sovereigns, and Harṣa-vardhana was reputed to have created them throughout his realm.⁷⁵ The *Sukranīti*, reflecting the Hindu ideal of organization, specifies that rest-houses, solid and provided with water, were to be established between all villages.⁷⁶ The same concern is to be found in the Islām world;⁷⁷ hence, the Muslims who conquered and ruled over a considerable territory on the peninsula could in this domain call upon two traditions.

In the fourteenth century Kēraḷa under the rule of Hindu princes, Ibn Baṭṭūṭah writes⁷⁸ that over the distance of a two-month march, 'the way passes beneath the shade cast by trees; at each half-mile there is a wooden house wherein is a dais on which all travellers take their places, Muslim or infidel. Near to each of these houses is a well where one can drink and whose custody is appointed to an idolater....' During the same period, in Hindusthān, Fīrūz Shāh Tughlāk was said to have had some hundred tanks dug and some two hundred rest-houses built.⁷⁹

Beginning with Sher Shāh, all the Grand Mughals had an ambitious road policy, the scope and limits of which we shall attempt to measure. And, in those areas where the action of the state remained ineffective, private initiative compensated: local princes, wealthy merchants, rural

73. D.C. Sirkar, *Inscriptions of Aśoka*, 76.

74. Watters, *On Yuan Chwang's Travels in India*, vol. I, 286-8.

75. *Ibid.*, 328, 344.

76. *Sukranīti*, ch. I, 538-49.

77. The Omayyads and Abbassids were concerned with this problem. Valid the First (705-15) at the beginning of his reign, had the roads of his empire repaired and lined with landmarks; Omar II (717-20) completed the work of his predecessor, having serais constructed and wells dug in the eastern provinces. The Abbassid caliphs, Al-Saffāh and Al-Mahdī, developed the Mecca route and erected mile-stones, shelter for pilgrims and provided for points with drinkable water (Husaini, *Administration under the Moguls*, 246).

78. *Voyages* (transl. Défréméry), t. IV, 71.

79. *Tabaqāt-i-Akbarī*, in Elliot, *History of India*, vol. IV, 18 n. 1.

or religious communities, participated by their contributions to these 'charitable'⁸⁰ works, the extent of which is difficult to assess with precision, but which must have been considerable.

80. This work astounded the majority of European travellers. Forbes, in *Oriental Memoirs* (vol. II, 232) wrote: 'Charity of this kind is everywhere inculcated; and it is equally the ambition of a southern Malabar as of a northern Hindoo to have a tank, a well, a choultrie, called after his name. Under despotic princes, where property is never secure, and where to be reputed rich is to be really unfortunate, such munificent acts are far from being uncommon: the fame of these benevolent works, and the tranquillity of domestic life, form the chief happiness of a people accustomed to public spectacles, or the refinements of polished society'. Regarding this subject, vide Kane, *History of Dharmaśāstra*, vol. II, part II, 889-96 (*pratiṣṭhā* and *utsarga*: foundations of temples and dedication of wells, tanks, parks, trees, etc., for the benefit of the public).

3. Tree-Lined Avenues and Milestones

a. TREE-LINED AVENUES

It is easily understood that the planting of trees along the roadsides was one of the traditional forms of philanthropy in a country in which wayfaring is tedious during the intolerable heat of the dry season.¹ These avenues were comprised of different species of trees, having diverse medicinal properties, and which were often attributed with religious significance.²

In the northern plains, the most common were the flamboyant (*dhāk*, *Butea frondosa*, Roxb.), with splendid flowering, orange and vermillion; the elegant margosa (*nīm*, *Azadirachta indica*, Juss.), providing an especially beneficial shade; the *pīpal* (*Ficus religiosa*, L.), the *bodhi* trees having an exceptional longevity and whose foliage is sensitive to the slightest movement of wind; finally, the banian (*bar*, *Ficus indica*, Roxb.), with multiple rooting branches, the most impressive of all.³

In the south of the peninsula, other than the banian, two other trees are to be found which offer very refreshing shade: the mango (*Mangifera indica*, L.) and the tamarind (*Tamarindus indica*, L.).⁴ The foliage

1. The brahmins say that he who plants a tree lives long (*M.G.*, 813). The *Sukraniti* (ch. IV, IV, 91-122) recommends the planting of trees in the villages, in particular those which give beautiful flowers and bear good fruit foreseeing between them a distance of 20, 15 or 10 cubits according to the species, and the watering of them mornings and evenings during the summer and, in winter, every second day.

2. Vide D.V. Cowen, *Flowering Trees and Shrubs in India*, and W. Crooke, *Popular Religion and Folklore of Northern India*, vol. II, 83-121; Tree worship.

3. These are the trees noted by Mundy (*Travels*, vol. II, 83-4) on the route from Āgrā to Ilāhābād: 'The Sort of Trees are Neems (like to Ashes) [*nīm*], Peeples (like great Peare trees) [*pīpal*], Dhaca [*dhāk*] and Bhurr [*bar*] with broad leaves; and others, which continue all waies greene, as most of all the Trees in India doe the like'.

4. According to Forbes (*Oriental Memoirs*, vol. I, 232, 238) in Travancore tamarinds, mangoes and above all cashews (*Anacardium occidentale*), *kasumāvu* in Malayālam, were planted alongside the roads. Heyne (*Tracts*, 15) records that one found in Tamil country above all banians, mangoes, tamarinds, portia trees (*Thespesia populnea*) and pongams (*Pongamia glabra*). *M.G.* (813) provides a list of trees used to border the roads in South India, as well as information pertaining to the resistance of different species to inclement weather. Further, the manner in which these trees were planted is indicated: pits of two-metre depth were dug at regular intervals, which, after planting, were filled with earth, and around which a

of the mango forms a dense covering, impenetrable to light; while the tamarind was commonly planted, even though its shade was considered by the people of the country to be unwholesome.⁵

The most extensive among these trees served as shelter to travellers during the afternoon halt. Some enormous banians with their multiple ramifications could shelter entire caravans.⁶

One frequently encounters in India trees in the shade of which travellers pass the time of intense heat. They prepare the provisions they have carried and drink water from the ponds next to which these trees have been planted. There one sees small fruit merchants and vendors of parched rice, clusters of people and horses from all parts. The tree beneath which I halted could cover with its shade more than 600 people.⁷

Tavernier⁸ states that throughout the seventeenth century India most of the roads were lined with trees. In fact, their prevalence must have varied much according to region.

Maṅkammāl Cālai

There are still in the southern part of the peninsula very old rows of

small earthen wall of one-metre height was raised, so as to protect the tree from cattle. It was to be watered and tended to for at least five years.

5. It is true that during the rains the leaves of the tamarind which fall on the cloth of a tent discolour and corrode it within a few days (Watt, *Commercial Products*, 1066). There is furthermore a popular legend on this subject: A man was preparing to set forth on a journey, and his wife, who could not become accustomed to the idea of such a separation and wished that he return within a short time, went to consult a sage regarding the measures to be taken to ensure that her wish be fulfilled. The latter thereupon counselled the husband to sleep each night of the journey towards his destination beneath a tamarind tree, and on his return beneath a margosa. At the end of a few days, resultant of the acidic vapours emitted by the tamarind, the poor man was so ill that he decided to break off his journey. Returning the same way by which he had come, he regularly took rest beneath margosas. As these have curative properties, when he arrived at his home, he was completely healed (Cowen, *Flowering Trees*, 17-18).

6. On an isle of the Narmadā, approx. 20 km upstream from Bharuc, there existed an enormous banian, known by the name *Kābir bar*, which had in 1780 a circumference of 3,000 feet. During the passage of an army it was said to have sheltered 7,000 men. In 1825, according to Heber, it was mutilated, the river having carried away part of it; nevertheless, it was 'one of the most noble groves in the world' (Thorn, *Memoirs*, 292-3; Heber, *Narrative*, vol. III, 67-8; *I.G.*, vol. III, 102). Falkland (*Chow-Chow*, vol. I, 206-7) describes another located near Pune which covered an area of 3 to 4 acres, a veritable cathedral with numerous chapels and galleries. At Cicolli, on the road from Baitūl to Nāgpur, there was a magnificent *bargat*, or banian, sheltering a large well beneath which some 500 horses could be tied (*Gazetteer of the Central Provinces*, 171).

7. Anquetil Duperron, *Zend*, t. I, I, XLII (on the Qāsimbāzār route).

8. Tavernier, *Travels*, vol. I, 233.

tamarinds and banyans, between Vēlūr and Beṅgalūru, Rāṇippēṭṭai and Cittūru, as well as between Beṅgalūru and Maisūru.⁹ It is, however, above all in the Tirunelvēli district that the greatest number of these avenues are to be found, called locally *Maṅkammāl cālai*,¹⁰ after the name of the celebrated Nāyak queen (1689-1706) to whom is attributed the planting of these trees. The best conserved are in the *tāluku*s of Nāṅkunēri and Tiruccentūr; for example, to the north, between Tirunelvēli and Śrīvilliputtūr (extending over some 80 km); to the south, from CēraNmakātēvi to Kaḷakkāṭu (covering 29 km); to the west, from ĀLvārkuRicci to Civacailam (for only a few kilometres); finally, to the east extending over some 100 km between Tirunelvēli and Rāmēśvaram via VaippāRu, where in places these avenues can still be seen near the present-day route.¹¹

At the close of the eighteenth century, Heyne¹² noted that the avenues in Tamil country, so very advantageous to travellers, were nonetheless irregular 'from the view point of distance and the number of trees, of their size or even their continuity', and that there were sometimes 'gaps of several miles'.

On the other hand, throughout India they were particularly well maintained at the approaches to towns or villages. Stavorinus, describing Surat at the close of the eighteenth century, appreciated the shade provided by the tree-lined avenues radiating around the port:

There are several fine roads by which to make one's way from the town into the interior of the country. Setting forth from the *Athvā* gate [to the south-west] one arrives at a wide and lovely road which runs southwards at a short distance from the river and along which are planted beautiful trees of dense foliage as far as *Athvā* itself.... On the other side of the city is the *Variāv* route [to the north] ...it is a good and pleasant road, bordered almost everywhere with dense trees which provide a delectable shade. Also from the *Katārgām* gate [to the north-northeast], a good road sets out to the village of that name. But the road which I found the most agreeable is that which one calls *Laatjes* (Avenues), for it is straight and perfectly shaded... This road very much resembles the main routes on the Isle of Walcheren.¹³

9. Vide *M.D.M., North Arcot*, 141: as of 1862, Robinson, the collector, had trees planted systematically along all the main roads of the district. A recent journey allowed us to observe the beautiful avenues (of old banyans and tamarinds) between Vēlūr and Ampūr, between Mattūr and Kīrṣṇakiri (Kṛṣṇagiri) and, to the east of the latter city, on the old road of Tīpū Sultān leading to Būdīkōṭe, as well as between Beṅgalūru and Maisūru.

10. *Cālai* (Tam.), house, palace, avenue, tree-lined roadway.

11. *M.D.G., Tinnevely*, 1907, vol. I, 241. Orme (*History of the Military Transactions*, vol. III) has designated an avenue of trees along the Maturai road between Kayattār and Kōvilpaṭṭi on his map of the Coromandel Coast.

12. Heyne, *Tracts*, 15.

13. Stavorinus, *Voyage*, 1774-78, t. I, 332-3; English edition, vol. II, 389-91. Vide in the *Bombay Gazetteer*, vol. II, *Surat*, f.p. 301, the map of the city of Surat.

*Role of the Emperors: The Khayābān of Jahāngīr*¹⁴

In the heart of Hindusthān, the Mughal sovereigns concerned themselves with this question in a systematic manner. Śer Śāh would appear to have been the initiator of this policy, for it was he who is said to have had trees planted along the roads, so as to provide shelter for the travellers' rest.¹⁵ Akbar must have continued his work; however, it is Jahāngīr to whom is generally attributed the shaded avenues (*khayābān*) of the Grand Trunk Road.¹⁶

It is clear that one had intended to make of the main route a long ribbon of oases, offering travellers relaxation and rest. The testimony of European wayfarers allows us to appreciate the amplitude of the undertaking.

The route from Āgrā to Lāhaur was the object of a particular solicitude. All travellers who journeyed that way in the seventeenth century have expressed their wonder at the magnificent achievement. Thomas Coryat (1615), who was well acquainted with the roads of Europe and Asia, does not conceal his admiration when he describes it as 'the most incomparable shew of that kinde that ever my eies survaied'.¹⁷ Terry is no less enthusiastic when he speaks of 'the large trees, well provided with foliage throughout the year and extremely beneficial to travellers by the shade they offer in these climates'; and he says that the English referred to it as 'the Long Walk'.¹⁸ This grand avenue made such an impression on the foreign travellers that it became an essential feature of all the seventeenth century maps of India published in Europe.¹⁹

One had also wanted to continue the avenue from Āgrā to Ilāhā-

14. *Khayābān* (Pers., H.), parterre, avenue.

15. According to 'Abbās Khan, *Tū'rikh-i-Śer Śāhī*, in Elliot, *History of India*, vol. IV, 418.

16. He states this explicitly in his memoirs: 'Previously to this, according to orders, they had planted trees on both sides from Āgrā as far as the river of Aṭak (the Indus) and had made an avenue in the same way from Āgrā to Baṅgāl' (*Tūzuk*, vol. II, 100). Finch (in *E.T.*, 60) writes that Jahāngīr had the row of trees to be planted which lines the route from Āgrā to Kābul. Manucci (*Storia*, vol. I, 159), recalling the work of Akbar's son, specifies that he ordered an avenue of trees to be made between Multān and Ilāhābād.

17. Coryat, in *E.T.*, 244.

18. Terry, in *E.T.*, 283-4; Tavernier (*Travels*, vol. I, 78), Bernier (*Travels*, 284), Thévenot (*Travels*, 57, 85), Steel and Crowther (in *Purchas*, vol. IV, 268) all make reference to the tree-lined avenue in laudatory terms.

19. Without doubt Coryat must have described enthusiastically 'the Long Walk' to Thomas Roe so that the latter counsel Baffin to indicate it in his map of 1619 (Roe, *Embassy*, first edition, vol. II, 537, 544). One finds the grand avenue on later maps, in particular on that which accompanies the 1713 edition of Bernier's *Voyages* (vide our *Recherches*, 103-4 and pl. XXII).

bād. In 1632, Mundy setting forth from the capital noted in his journal: 'There is nothing remarkable about this route, save for two rows of trees on either side; the distance between each tree is from 8 to 9 paces and, between the rows, some 40 paces. It is commonly known that there are such tree-lined avenues from Āgrā to Lāhaur'.²⁰ He regularly makes note of the shaded avenue as far as Jasvantnagar;²¹ but, from Korā Khās onwards, he remarks that the trees become less frequent and more sparse, through lack of care: some were dead, others had been felled, without having been replaced.²² Thus indicating that the imperial instructions could not be fully executed.

However, before his arrival in Paṭnā, Mundy emphasized the re-appearance at some three or four *kos* from the city of the rows of trees which had disappeared so many days previously.²³ Manrique,²⁴ who travelled the route in the opposite direction in 1640, records that the majority of the villages were located in clumps of green-leaved trees, which offered pleasant shade to the wearied travellers at the entrance and exit to the villages.

The fact remains that this imperial work represents a great effort, for if the main road were to have been bordered with trees from Lāhaur to Korā Khās, that would represent an avenue of some 1,100 km.²⁵ Probably, the honour of achieving such an undertaking must not be ascribed to Jahāngīr alone; for, his immediate predecessors must have already been involved in its development.²⁶

As of the end of Śāh Jahān's reign, however, it seems that the state was less concerned with providing the routes with shade. Tavernier,²⁷ while admiring the grand avenue from Āgrā to Lāhaur, deplored that in certain places one had allowed the trees to perish, without thinking to replace them. At the time of Aurāngzeb, the administration had more urgent problems to settle and, in the eighteenth century, during the decline of the empire, all roads between the Gaṅgā and the Jamunā

20. Mundy, *Travels*, vol. II, 83-4.

21. *Ibid.*, 86.

22. *Ibid.*, 92.

23. *Ibid.*, 134.

24. Manrique, *Travels*, vol. II, 149.

25. 517 miles from Lāhaur to Āgrā and 184 miles from Āgrā to Korā Khās, according to Rennell's *Table of Distances* (*Memoir*, 1792, 318); that makes 701 miles or approx. 1,100 km.

26. When Coryat made his way from Lāhaur to Āgrā in 1615, Jahāngīr had been emperor for only ten years; even if he had directed the planting of these trees at the beginning of his reign, they would not have been able in such a short time to have provided the exceptional shade of which the English traveller speaks. Furthermore, Jahāngīr only then refers to this when he gives an account of the fourteenth year of his government (*Tūzūk*, vol. II, 100).

27. Tavernier, *Travels*, vol. I, 78. He made several journeys in India between 1645 and 1665.

were laid waste by the armies. Law de Lauriston,²⁸ proceeding from Dehli to Āgrā in 1758, noted melancholically: 'I nowhere saw those tree-lined avenues, nor any mark that they had been'. Sleeman, in the mid-nineteenth century, lamented the absence of trees in the Doāb and the regions of the ancient capitals: 'In all other areas of India one can at each stage pitch his tent in a grove... but in the districts located to the north of Āgrā, one might make ten marches without ever finding the shelter of a cluster of trees. The *Sikh*, the *Marāṭhā*, the *Jāt* and the *Paṭhān* destroyed them during the disorders which accompanied the decline of the Muslim empire, and they have never been re-newed, for one could not be sure that they would be allowed to grow for ten years'.²⁹ Thus, in less than a century 'the Long Walk', which had once evoked the admiration of foreign travellers, was to have vanished completely from the countrysides of Northern India.

From this exposition, one should hold in mind the fact that during the ascendant period of the Mughal era, the development of the tree-lined avenues reflected the will of the sovereigns to determine the course of the communication lines, which were thus imbued with a political significance, as were in further instance the milestones, which shall now be considered.

b. MILESTONES

*Route Measurements*³⁰

In India, just as in an earlier period of European history, there existed a multitude of regional metrologies; and, so as to designate the units of

28. Law de Lauriston, *Mémoire*, 511.

29. Sleeman, *Rambles*, 433, 448.

30. Attentive observers have remarked that in the past Indians had, on the local level, a remarkable knowledge of distances. Tod (*Travels in Western India*, 355) in particular notes with astonishment: 'Among the many points which present themselves to the reflection of a traveller in India, one which ought to strike him with surprise is the general knowledge possessed by all classes of the distance of places within their immediate neighbourhood; and however the standard may vary in different countries, yet within their own, a most singular uniformity and correctness prevail. To what can this be attributed? Assuredly not to accident, nor to the mere report of the public *cassids*, or runners. It is in fact a remnant of that ancient civilisation which we are accustomed to hold so cheap, embracing whatever related to welfare, comfort and intelligence of the community, and which, though buried under the ruins of ages of moral and political subjection, is not yet altogether obliterated, either from tradition or written records, both attesting that in remote times, *there were roadmeters throughout India*'. This fact is probably connected with the surveying of lands and the establishment of the public registry. It is known that the Indian sovereigns, at least since the *Maurya* period, undertook a planimetric census of cultivable lands to the purpose of determining the tax on harvests, their main resource. For the same reason, the Arabs beginning with Omar had the

measurements, each linguistic group had its own diverse expressions which themselves did not always correspond to identical values, as the appendix to which we refer the reader (*infra*) readily shows. The monarchs who, with their agents, messengers and their armies, were the major road users, attempted to standardize the road measurements so as to administer the important highways in a coherent fashion, to re-organize the provincial networks and, in this way, facilitate the transmission of orders and accelerate the process of centralization. Thus the royal *kos*³¹ was defined, the base unit which was used to evaluate the distances of the main routes of the empire. It is significant that Bābur, the creator of the Mughal monarchy, had ordered the measurement of the strategic north-western route, from Āgrā to Kābul, immediately upon having become ruler of Hindusthān.³² His successors did likewise, and whenever the emperor or an important personage set out on a journey, men were deputed to ascertain the distance to be travelled,³³ even though the route might be known. An habitual operation resembling a veritable rite. One foreign observer³⁴ was to write in the eighteenth century that this served scarcely more 'than the splendour and vanity of the Moor Lords'. Nevertheless, one will concede that this procedure had a deeper significance for the Grand Mughals, as they intended to line the route with milestones regularly spaced at intervals of one *kos*.

Ancient Milestones

The demarcation of roadways is not a Mughal innovation, having

taxable lands surveyed. This double tradition was followed by the monarchs in India. 'Alā-ud-dīn Khiljī adopted it in a strict manner; Śer Śāh had all the lands of the empire systematically surveyed; Akbar perfected the methods and dispatched a large number of inspectors to supervise the operations. It is evident that the roads were measured at the same time as the land, because in the villages they served the division of properties, as indicated by South Indian inscriptions (Appadorai, *Economic Conditions*, vol. I, 97). This difficult but fascinating subject now begins to be studied by researchers interested in the history of land occupancy. Vide Tripathi, *Moslem Administration*, 260-2, 299-302, 316-18; regarding the different units of agrarian measurement during the Mughal period, vide Habib, *Agrarian System*, 'Measures of land', Appendix A, 353-66; one will find in a manual from the mid-nineteenth century (R. Smyth and H.L. Thuillier, *A Manual of Surveying for India*, London, 1855, 514-23) precise details concerning the indigenous methods of surveying, or *khasrā*.

31. Vide appendix, *infra*, 288-292.

32. *Bābur-nāma*, vol. II, 629.

33. *Ā'in*, vol. II, 417; Monserrate, *Mongolicae*, 78; Ovington, *Voyage*, 117; Manucci, *Storia*, vol. II, 64; Rennell, *Memoir*, 83. This information was utilized in our *Recherches* (74-5).

34. Father Coeurdoux, letter of 12 February 1760, in *Lettres édifiantes*,

already existed under the *Maurya*. Megasthenes had made mention thereof.³⁵ Archaeological studies provide confirmation: in the Laghmān Valley of Afghānistān, 7 km from Alexander's ancient Nicaea, an Aśokan inscription was found on a vertical slab overlooking the old Indian route which had served as a signpost.³⁶ In the fourteenth century, during the time of Muḥammad Tughlaq, Ibn Baṭṭūṭah noted the milestones between Dehlī and Dhār:

There is between the two places a travelling distance of twenty-four days. Along the road separating them are found columns upon which is engraved the number of miles lying between two such pillars. Should the traveller wish to know how much way he has achieved during his day, and what distance yet remains for him to reach the station or town towards which he is proceeding, he reads the inscription on the pillar and learns what he wanted to know.³⁷

Unfortunately, no traces thereof have been found.³⁸ However, it is practically certain that the usage of lining the routes with markers had never been entirely forsaken. The archaeological department of Tamil-nāḍu has made two exceptional finds in this domain. Firstly, at Tiruvannāmalai on the old pilgrimage route proceeding around the hill, five stones have been found, which according to the Tamil inscriptions they bear, lined the road constructed by Vikkīrama PāṇṭiyaN in the thirteenth century. One has also found near Tarmapuri (Dharmapuri) and Tiruppur three *kātam*-stones dating from the thirteenth century (vide Fig. XIX) upon which are inscribed the name of the sovereign (AtiyamāN) responsible for the building of the road, as well as the distance between the point where it stands and an unidentified town in the region.³⁹ In Gujarāt have been recently discovered eleven towers which

vol. XV, 153.

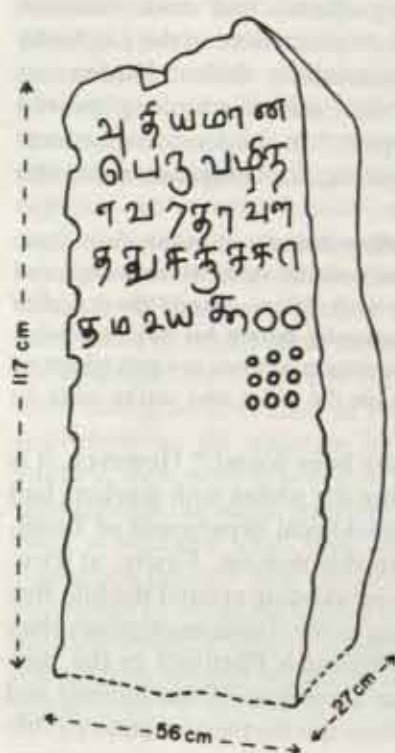
35. According to Megasthenes, the *agoranomoi* had, among other functions, to see that signposts and milestones were placed at every ten stadia (Strabo, *Géog.*, bk. XV, 1, 50).

36. A. Dupont-Sommer, 'Une nouvelle inscription araméenne d'Aśoka trouvée dans la vallée du Laghmān (Afghānistān)', *Académie des inscriptions et belles-lettres, comptes-rendus des séances de l'année 1970*, 158-73. The author of the article translates the inscription as follows (163): 'At 200 'arcs', the place called Tadmor is there. This is the KNPTY route, that is (3a) the Garden (?) (route): more than 120 ('arcs'). To Trt, here: 100. Above: 80'. He supposes that Tadmor corresponds to Palmyra (?).

37. *Voyages* (transl. Défréméry), t. IV, 42-3.

38. In fact, archaeologists are not really interested in them. The publications of the Archaeological Survey of India sometimes mention pillars or rock mounds situated along the roads; but, lacking any inscription, it is practically impossible to identify them (*L.A.R.C.P.B.*, 4-5; *L.A.R.N.T.*, 54-5).

39. Vide our study on itinerary measures and milestones in thirteenth century Tamil country in our article, *De la trouée de Palghat et du plateau de Maisur*



XIX. Ancient milestone in Tamil country, found in the Tarmapuri (Dharmapuri) district (adapted from a photo taken by the author).

had served as route-indicators, dating from the Sultans' period (fifteenth-sixteenth centuries).⁴⁰

In the Aurangābād district, 33 km south of the Antūr fort, a rectangular stone pillar was found. A Persian inscription mentions, on each pillar face, the name, the distance and direction of several towns (Nāgpur and Jālnā, Mevār and Cālīsāmv, Antūr and Burhānpur, Daulatābād and Aḥmadnagar) and specifies that the pillar was erected during the reign of Murtaẓā Nizām Šāh in 1591;⁴¹ evidence that road-markers were known in the ancient realm of Aḥmadnagar prior to the Mughal conquest.

Along trails or mountain tracks, a diversity of markers were employed to prevent the travellers' going astray: raised stones, such as those indicated by Tod⁴² at the Mukandvārā Pass in the district of Koṭā,

à la pédiplaine tamoule: liaisons routières anciennes et vestiges de chemins, *B.E.F.E.O.*, t. LXXVIII, 1991, 70-71, 85 and 68-70, 84.

40. Vide Monim K.N., Route indicators of the Sultanate period in Gujarāt, *Journal of the Maharaja Sayajirao University of Baroda (Humanities)*, vol. XXI-XXIII, No. 1, 1982-1983, 121-30.

41. *L.A.R.N.T.*, 5.

42. Tod. *Annals*, 1873 edition, vol. II, 644.

set in place by the *Banjārā* to guide their caravans through the forest; or simple stacks of smaller stones, as were to be found in the difficult areas of the Satlaj Valley.⁴³ These were, however, but *points of reference*.⁴⁴ Tavernier⁴⁵ relates that small stones were placed at every 500 paces along the roads throughout the seventeenth century India, which the nearby villagers were to whiten from time to time, so that couriers might distinguish the way in nights of darkness and rain. In which case, these would not have been merely signs serving as orientation, but markers indicating the distances. These were divisional markers of the Indian mile, corresponding to the hectometres between the kilometres on the French roads. We have no knowledge of them, because, for one reason, no one else has, as far as we know, made note of these stones; and, for another, no vestiges of them have been found, not even between the *kos-minār* which have been discovered on certain of the imperial highways.

Mughal Kos-minār

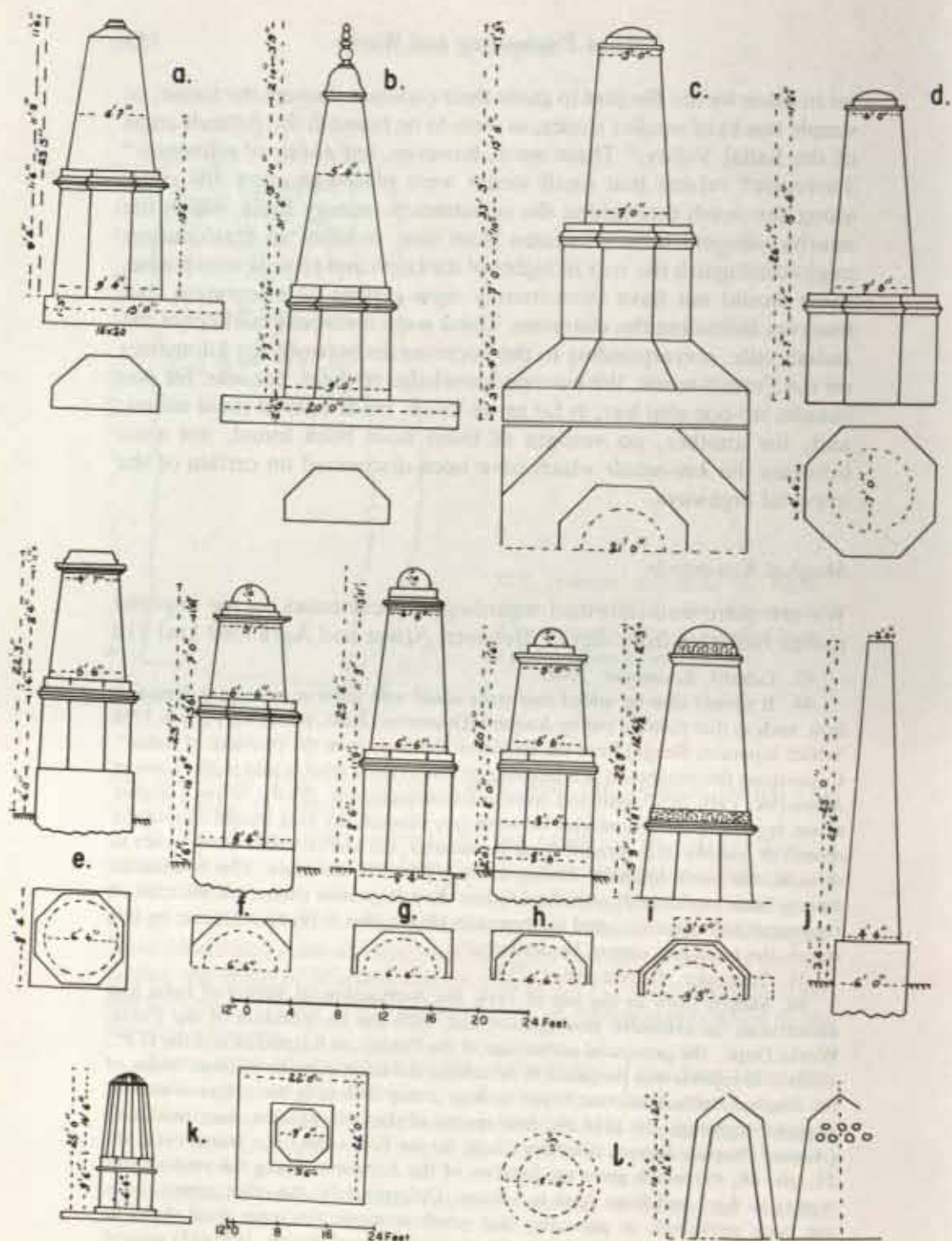
We are quite well-informed regarding the milestones on the imperial routes radiating from Āgrā.⁴⁶ Between Ajmer and Āgrā (368 km) 110

43. Gerard, *Koonawur*, 39-40.

44. It should also be added that trees could well serve as boundary demarcation, such as that pointed out by Anquetil Duperron (*Zend*, t. I, I, XLVIII) in 1756 'which separates Bengal from the district of Patna or from the province of Bahar'. Concerning this subject, it is interesting to call to mind what is said in the *Laws of Manu* (bk. VIII, 245-7, édition Loiseleur Deslongschamps, 288-9): 'When a dispute arises regarding the boundaries between two villages, the king should choose the month of *jyāistha* to determine these boundaries, the markers then being easier to discern, the sun's intensity having entirely parched the grass. The boundaries having been established, *one should plant there large trees* (there follows a list of recommended species)... and earthen mounds are also to be raised there: by this means the boundary cannot be destroyed'.

45. Tavernier, *Travels*, vol. I, 233.

46. Shortly prior to the war of 1914, the Archaeological Survey of India had undertaken an extensive investigation and, with the co-operation of the Public Works Dept., the provincial authorities of the Pañjāb, of Rājputānā and the U.P., a series of reports was prepared to determine the exact position of these 'relics of the Mughal civilisation': one hoped to draw a map indicating the course of the old imperial highways. In 1914 the first results of the investigation were published (*Annual Progress Report, Northern Circle, for the Year ending 31st March 1914*, 45-51, pls. 44, 45) which gives the location of the *kos-minār* lining the routes from Ajmer to Āgrā and from Āgrā to Lāhaur. Unfortunately, the other reports have not been published, in particular that which concerns the route from Āgrā to Ilāhābād. At the most, one finds in the *Annual Progress Report, 1915* (17) several corrections of the list of markers in the state of Kāśmīr and in the following report (*Annual Progress Report, 1917-9*, 78, 81, 87) information regarding the restoration of several *minār* in the Pañjāb and the U.P. Vide also *A.S.R.*, 1920-21, 3; 1921-22, 4; 1922-23, 188; 1925-26, 17; 1926-27, 4-5; 1927-28, 18, 50, 91.



XX. Types of Kos-minār (A): a., b., c., d., on the route from Āgrā to Mathurā; e., f., g., h., on the route from Āgrā to Fatehpur-Sikrī; i., on the route from Ajmer to Kīṣāṅgarh; j., in the Bulandshahr district; k., in the Kīṣāṅgarh district; l., in the Kānpur district (from *Annual Progress Report, Superintendent, Muhammadan and British Monuments, Northern Circle*, 1914, pl. 44).

have been registered,⁴⁷ 34 between Āgrā and Dehlī (220 km), 78 between Dehlī and Lāhaur (600 km),⁴⁸ and at least twenty between Āgrā and Ilāhābād (470 km).⁴⁹ But such markers also existed on other roads⁵⁰ and were noted by the eighteenth century travellers, as for example between Faizābād and Āgrā⁵¹ and, in the Deccan in the vicinities of Haidarābād and Macilipattanam.⁵² In addition, the *Gorkhā* in Nepāl, imitating the Mughals, erected the same along their tracks.⁵³ At the time of a recent journey we found and identified at the exit from Haidarābād some of the pillars mentioned by travellers;⁵⁴ we also

47. *Annual Progress Report, 1914*, 45-7.

48. *Ibid.*, 48-51.

49. Montgomery (*Statist. Report of the district of Cawnpore*, 1849, 83, No. 374, 103, No. 471, 108, No. 487) mentions them on the old Mughal route traversing Kānpur district in the *parganah* of Sikandrā, of Bhognipur (20), and of Ghātampur (4). In the *Annual Progress Report, 1917-19*, (78-9), four are cited in the Itāwā district and 15 in the district of Kānpur.

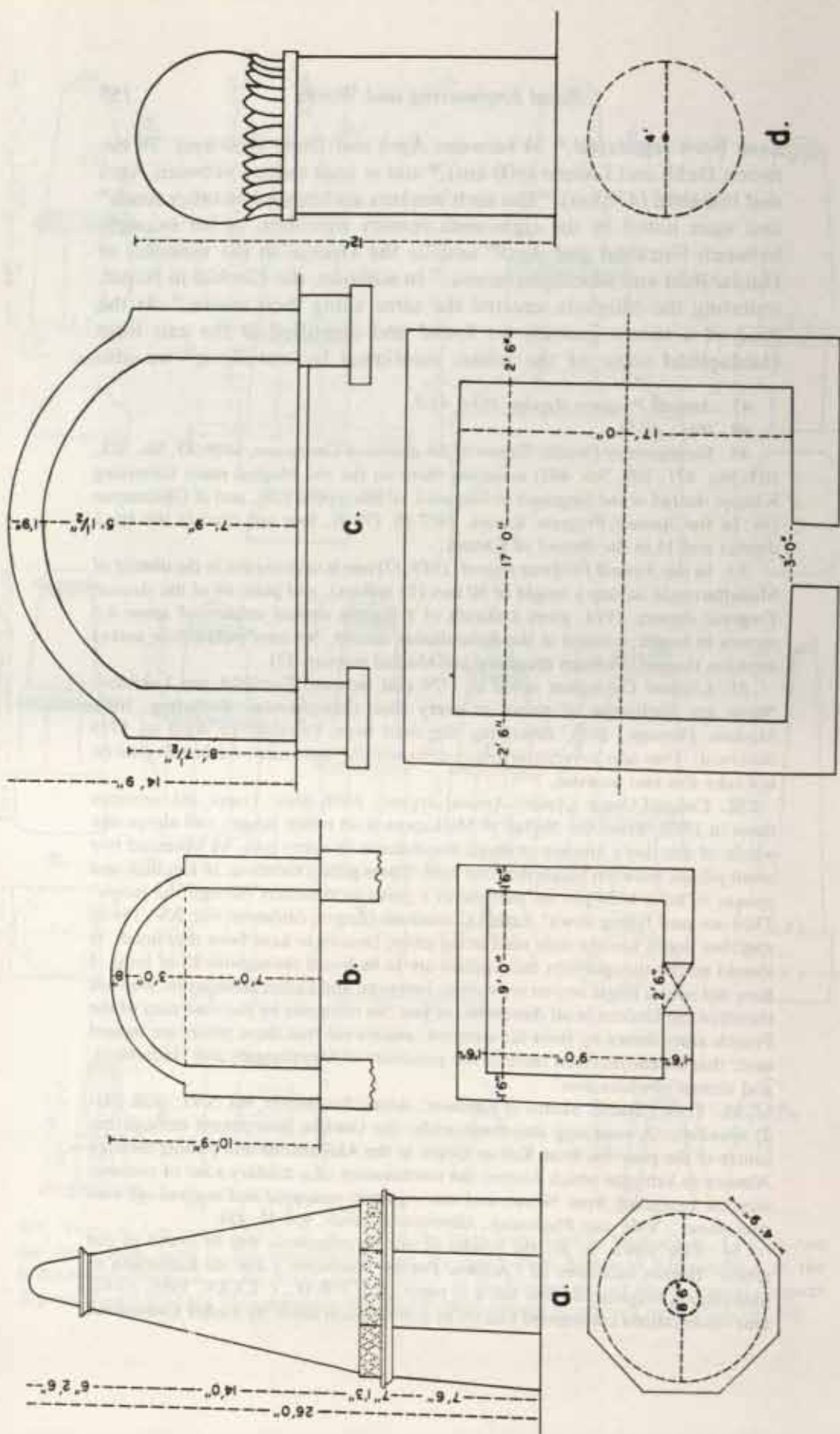
50. In the *Annual Progress Report, 1913*, (7) one is said to exist in the district of Muzaffarnagar having a height of 50 feet (15 metres), and plate 44 of the *Annual Progress Report, 1914*, gives a sketch of a slightly conical column of some 8.5 metres in height, located in the Bulandshahr district. No later publication makes mention thereof. Perhaps those are not Mughal markers (?).

51. Colonel Champion noted in 1774 that between Faizābād and Lakhnāu, 'there are obelisks or stones at every coss' (Macpherson, *Soldiering*, 105). Modave (*Voyage*, 201), describing the road from Faizābād to Āgrā in 1775 observed: 'One sees several turrets to designate the distances'. Archaeologists do not take this into account.

52. Colonel Upton (*Asiatic Annual Register, 1804, Misc. Tracts*, 26) mentions them in 1777: 'From the Nullah to Mulkapore is an entire jungle; and almost the whole of this day's journey at about the distance of every coss, we observed two small pillars, between which the road runs. These pillars are about 18 feet high and appear to have been put on purpose as a guide to travellers through the jungle. They are now falling down'. Father Coeurdoux (*Lettres édifiantes*, vol. XV, 154-5) specifies that it was the only road in the entire Deccan to have been thus lined: 'It should not be thought that these pillars are to be found throughout all of India. I have not seen a single one on my various journeys, and Father Montjustin, who has travelled the Deccan in all directions, as you can recognise by the road map of the French army drawn up from his memoirs, assures me that these pillars are indeed rare, that he encountered them in the proximity of Masulipatam and Héderabad, and almost nowhere else'.

53. Traill ('Statist. Sketch of Kamaon', *Asiatic Researches*, vol. XVI, 1828, 141-2) specifies: 'A road was also made under the Gorkha government through the centre of the province from Kali or Gogra to the Alakananda and passing through Almora to Srinagar which formed the continuation of a military road of communication extending from Nepal, and was regularly measured and marked off with coss-stones'. Vide also Phillimore, *Historical Records*, vol. II, 451.

54. Vide *supra*, n. 52; the results of our investigations will be found in our article, Bornes milliaires de l'Āndhra Pradesh, réservoirs à eau du Kārnātaka et monuments religieux du Sud liés à la route, *B.E.F.E.O.*, t. LXXV, 1986, 37-42. Our observations correspond exactly to a description made by Father Coeurdoux



XXI. Types of *kos-minar* (B): a., in Sultānpur; b., in the Rāvalpīṇḍī district (from *Annual Progress Report, Superintendent, Muhammadan and British Monuments, Northern Circle*, 1914, pl. 45); d., at the exit of Haidarābād on the Bejavāda route (based upon a personal survey).

believe to have recognized several in the Aurangābād district between Daulatābād and Rauzā on the old (untarred) Mughal road; however, as they lacked inscription, our identification is not certain.

This absence of engraved characters is peculiar. The markers would seem to have been made so as to bear inscriptions to guide travellers; there should be indications of the distance between the initial point, the capital city and the marker, as Father Coeurdoux⁵⁵ confirms elsewhere: 'Regardless of the fashion in which they have been made, one reads there the number of coss from that point to this or that other place'. However, investigations in Northern India have revealed none, nor have we discovered any on the markers in the Deccan. They have most likely vanished, the outer layer of mortar having been worn away; perhaps the inscriptions were painted, and not engraved, and were covered by the whitewash applied by the Public Works Department,⁵⁶ or they have been effaced by the wear of time.

Different types (vide Figs. XX and XXI)

The examination of the vestiges raises more questions than are thereby resolved. The size and form of the *minār* vary considerably from region to region. The markers in the districts of Rāvalpiṇḍī, Kānpur and Haidarābād have a height of from 3 to 4 metres; the others, of from 6 to 10 metres. On the routes from Āgrā to Ājmer and from Āgrā to Lāhaur, they are present as masonry columns of conical form, reposing on octagonal bases; on the Ilāhābād route were simple truncated cones, pierced at the top to allow the passage of fire provided by a lighting device installed in the interior, thus to guide night travellers, functioning both as milestones and lanterns.⁵⁷ The *minār* in the Rāvalpiṇḍī district are more enigmatic, as they appear to have assumed at the same time the role of shelters. One can imagine that there is some connection between these milestone-shelters and the towers mentioned by Bābur (vide *infra*, 158 n. 60); however, the relation of the forms is not well-understood. We think they pertain to relay stations⁵⁸ and not *kos*-

(*Lettres édifiantes*, vol. XV, 154): 'These pillars are located on either side of the road at a distance of six toises and are topped by a sphere in the style of Mughal towers; they are round and their diameter is approx. 3 feet. In other places they are only simple rocks, quite high, of a single piece and roughly hewn; in other places these pillars are scarcely 3 feet high'.

55. *Lettres édifiantes*, vol. XV, 154.

56. *A.S.R.*, 1927-28, 91.

57. *D.G.U.P.O.*, vol. XIX, Cawnpore, 86.

58. Burnes (*Travels*, vol. I, 127) noted at the beginning of the nineteenth century on the North-West route the remains of relay stations constructed every 5 or 6 miles by the Mughal emperors to permit rapid liaisons between Dehli and Kābul. He adds, that one could follow them as far as Balkh.

mīnār. In any case, the variety reflects not merely the character of the regional architecture, but must have a deeper significance.⁵⁹ For the time being, these archaeological indicia can only be clarified by means of the literary sources which offer information regarding the emperors' role in establishing the system of road markers.

Role of the Emperors

Under Bābur relay stations were constructed between Āgrā and Kābul,⁶⁰ but Akbar was the first to have lined the routes with *kos-mīnār*. It is almost certain that the milestones along the imperial highway from Āgrā to Ajmer were erected during his reign. Finch, Withington and Mundy make explicit statements to this effect.⁶¹ Jahān-gīr would have pursued his work in the direction of Lāhaur. He states in his memoirs⁶² that he gave the order to install these pillars (*mīl*) during the fourteenth year of his reign, i.e. anno 1619. It is true that neither Finch, in 1610, nor Coryat, who in 1615 had admired the magnificent tree-lined avenue, make mention of them.⁶³ Were they all erected by this sovereign? We do not know; it is possible that Śāhjahān had completed the work. In any case, when Bernier journeyed to Dehlī in the mid-seventeenth century, the 'small pyramids or towers' had all

59. Did the size of the *mīnār* vary regularly from one region to another? Did their form correspond to certain segments of the route, or to administrative boundaries? Some of them were perhaps repaired or reconstructed at a later date corresponding to a different style. If the exact distance separating the markers on the main roads were to be known (precise measurements have only been taken in the proximity of Dehlī), knowing the unit of measurement in use under each reign, the markers could probably be approximately dated. The information presently available to us is too summary to be able to respond to these questions.

60. In his memoirs (*Bābur-nāma*, vol. II, 629), Bābur states that after having ordered the measurement of the route from Āgrā to Kābul, he had towers of 12 *qārī* (7 or 10 metres) erected every 9 *kuroh* (or *kos*) with a *cār-dara* (?) at the top. Is there a connection between these towers and the milestones cum shelters of the Rāvalpīndī region which have been surveyed by the Archaeological Survey of India? The structure of the latter does not correspond to that of Bābur's works, but their function would appear to be the same (viz. relay stations). They seem nevertheless to have been constructed at a later date.

61. Finch (1610), in *E.T.*, 149; Withington (1614), in *E.T.*, 225; Mundy (1633), *Travels*, vol. II, 226. The majority of the *mīnār* still exist today; over a distance of 368 km, 110 have been found. One observes that their size does not vary significantly (6 to 8 metres), nor does their form, which nonetheless shows local variations in ornamentation.

62. *Tūzūk*, vol. II, 100.

63. Some of the milestones on the road from Āgrā to Mathūrā resemble very much those on the Ajmer road, others are more slender and terminate with a small pyramidal ornamentation.

been installed.⁶⁴ If one gives credence to Manucci,⁶⁵ the markers on the Ilāhābād road were also the work of Jahāngīr. It is nonetheless odd that such an observant traveller as Mundy, who did not fail to mention the *mīnār* on the Ajmer road, did not make reference to them at the time of his journey from Āgrā to Paṭnā in 1632. It is possible that they were erected at a later date.⁶⁶

The road markers on the route from Faizābād to Āgrā via Lakhnaū were probably installed during the course of the eighteenth century, at the time of the decline of the Mughal empire and the rapid development of the provincial dynasties. Then, there are the *kos-mīnār* in the Deccan, which perhaps owe their existence to a governor at the beginning of the eighteenth century, considering that there is no mention made of them by the travellers of the preceding century.

Be that as it may, the system of road markers, whose provision was linked with the vigour of the state, was not further maintained from the period of the empire's decline, when it was no longer in a position to concern itself with such undertakings. The *kos-mīnār* were no longer repaired. In the heart of the Mughal realm, the travellers deplored this state of ruin:⁶⁷

'They were perhaps previously more numerous', wrote Father Coeurdoux in 1760,⁶⁸ 'for those which remain are falling to ruin in several places and it might have been that time has destroyed those at other locations which were constructed only of masonry. And the same may come to pass, viewing the negligence of the Moor government, in the regions even nearer to Delhi, where our French travellers say they have encountered them. A Persian and man of wit, who has journeyed through all parts of Indoustan, assured me that one only finds them near large cities and that they continue no more than for one or two *manzils* or days'.

Conversely, everywhere on the main roads were to be found at regular intervals shelters where man and animal could rest in tranquillity, points with drinkable water and many types of other facilities intended to satisfy the wayfarers' material and moral needs.

64. Bernier, *Travels*, 284; *Voyages*, t. II, 66-67.

65. Manucci (*Storia*, vol. I, 164) writes that Jahāngīr was reputed to have installed some manner of pyramids from Multān to Ilāhābād.

66. Moreover, these milestones cum lanterns are quite different than those found on the other imperial highways.

67. Law de Lauriston (1760), *Mémoire*, 511; Modave (1774), *Voyage*, 321; Hodges (1783), *Travels*, 124; Heber (1824), *Narrative*, vol. II, 316, 324.

68. *Lettres édifiantes*, vol. XV, 155.

4. Rest-Houses

Halting points along the routes were of primary importance in long-distance travel on the sub-continent. Reflecting the customs of the inhabitants of a country having a hot climate who easily adapt themselves to a simple, unfurnished room, but little enhanced and exposed to all winds, they also were the expression of a stratified society, founded upon the notion of caste, wherein the injunctions regarding alimentation played a significant role. Hence ensue the different types of rest-houses which lent a veritable personality to the roadways.

These we shall group into two categories: the establishments of the Indian peninsula which were based upon the economic and religious foundations of Hindu society, and the caravanserais of the northern plains created by the Mughal administration.

a. SATTRA AND CĀVAḌI OF PENINSULAR INDIA

The ancient rest-houses of peninsular India have not attracted the attention of archaeologists;¹ yet, many are still to be found on the old trunk roads, in particular along the routes followed by pilgrims. Some are maintained by local authorities; in cities they have frequently been repaired or even entirely reconstructed; but in the countryside, many have fallen to ruin or have been abandoned to mendicants or to the homeless. Europeans have designated them indiscriminantly by the name *choultry* or *chauderie*,² while the people of the country call them *sattra*³ or *cāvaḍi*.⁴ These terms are frequently encountered in the local toponymy in which they form the suffixes of numerous place-names.

Their number and their characteristics vary according to the significance of the traffic and the region.

Types

The most simple were constructed of four posts bearing a palm-leaf

1. We have begun to make an inventory of them in Tamil country, especially along the old pilgrimage route linking Kāñci and Rāmēśvaram; the results of this investigation will comprise the subject of a separate study.

2. The words *choultry* (Anglo-Indian) and *chauderie* (French) would have been corruptions of *cāvaḍi* (vide Duperron, in Bernoulli, *Description*, t. II, 232, n. a; Dupeuty-Trahan, *Moniteur*, 265; Hobson-Jobson, 211).

3. *Sattra* (Skt.), *satra* (Kan.), *satramu* (Tel.), *cattiram* (Tam.).

4. *Cāvaḍi* (Kan., Tel.), *cāvaḍi* (Mal., Tam.), which would have been derived

roof; basic and provisional structures where shelter from the sun was found and drinkable water obtained, whence the name *tanṇīrppantal* in Tamil country.⁵ In the isolated province of the *Sarkār*, rectangular huts were built of walls of dried mud or of clay, covered with palm-leaves or thatch.⁶

To these humble habitations were contrasted abodes constructed in more durable materials: brick or stone. 'In the country', writes Degrandpré,⁷ 'it is usually only a square comprised of stone enclosed on three sides by walls, the front being open; and when the building is large, this front is embellished with two or three columns to support the roof-top'.⁸ These works of the *maṇḍapa*⁹ type in brick or stone with a terraced roof, or vaulted, supported by gneiss pillars, still exist in the proximity of Tamil villages.¹⁰

'In the vicinity of large towns, they are partitioned in apartments or cells in which each person might lodge alone, some having even an adjacent house, better allotted for the use of important personages'.¹¹ These buildings of a more elaborate construction consisted of a surrounding veranda, a number of rooms built around an inner courtyard, rectangular or square in shape, open to the heavens and bordered by columned gallery. Such is the *Pillai cattiram*, located 16 km west of Śriperumpuṭūr and constructed by a certain Vira Perumāḷ Pillai at the close of the eighteenth century, the description of which has been given by Buchanan and Heyne¹² and which today is maintained by the archaeological department (vide Fig. XXII). There is another con-

from the Sanskrit *catur* (four), *vāṭa* (road), place where four roads meet, cross-roads.

5. Buchanan, *Journey*, vol. I, 10; *M.D.M., Tanjore* (Row), 231. In fifteenth-century Vijayanagara, drinking water was served along the roads in structures called *aravaṭṭige* (*South Indian Inscriptions*, vol. IX, part II, N. 436); within the city, the streets were provided with buildings, called *gopura*, where one was given food and drink (vide V. Filliozat, 'Town Planning of Vijayanagara', *Aarp*, 14 December 1978, 61 and photo, fig. 8).

6. Heyne, *Tracts*, 251.

7. Degrandpré, *Voyage*, t. I, 146.

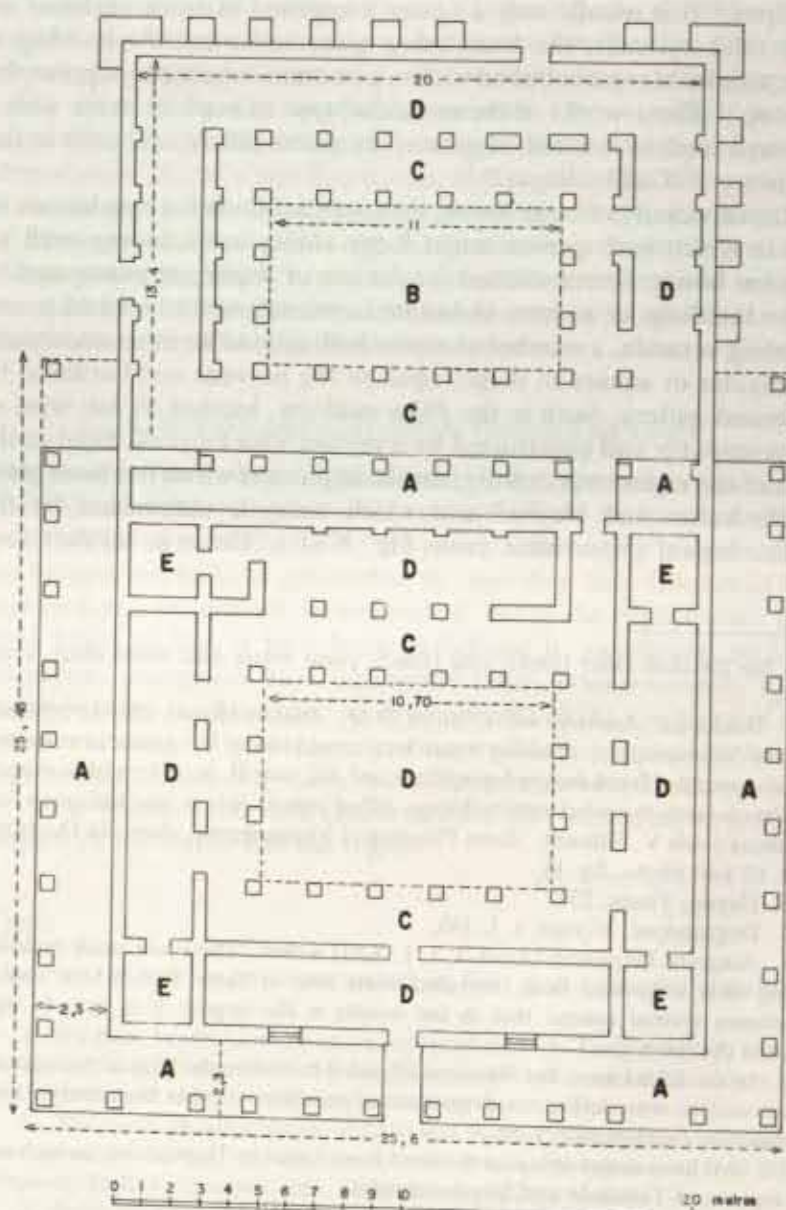
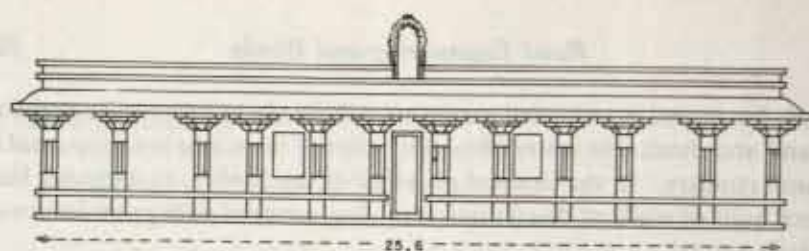
8. Anquetil Duperron (*Zend*, t. I, I, XXI) writes: 'These are small buildings having only a ground floor, elevated some two or three feet, which contain sometimes several rooms: that in the middle is the largest; it is entirely open towards the front'.

9. In the Kāñci area, the *maṇḍapa* intended to shelter the idols at the occasion of processions were left to the disposition of travellers at other than festival times (Buchanan, *Journey*, vol. I, 8).

10. We have noted many on the road from Kāñci to TiṇṭivāNam, as well as in the regions of Tañcāvūr and Tiruvaṇṇāmalai.

11. Degrandpré, *Voyage*, t. I, 146.

12. Buchanan, *Journey*, vol. I, 7; Heyne, *Tracts*, 16.



XXII. *Pīḷḷai cattiram* (plan kindly provided by the director of the Tamilnāḍu State Department of Archaeology): A., surrounding veranda; B., rectangular, uncovered inner courtyard, bordered by a pillared gallery; C., D., main building; E., corner rooms.

structed entirely of brick, with an archway gallery, in Periya Mutaliyār Cāvaṭi, some 7 km to the north of Putuccēri (Pondicherry).

The most impressive works are found on the old Rāmēśvaram route in the present district of Tañcāvūr. Frequently comprised of several buildings with inner courtyards, temples, *ghāt* on rivers or tanks, they were constructed by the Maratha kings in the second half of the eighteenth century and are known by the name *rājā cattiram*.¹³ Due to lack of maintenance, many of them have today fallen to ruin.

Organization

These institutions owed their existence to pious or charitable donations¹⁴ and subsisted upon revenues from lands which had been accorded them. The donors might have been kings or princes, such as Dēva Rāja in Maisūru,¹⁵ queen Mañkammāl in the Maturai region¹⁶ and the Maratha kings in Tañcāvūr; or then again, large landowners¹⁷ or rich merchants, such as the *Cetti* in Tamil country.¹⁸

A diversity of foundations, they were, as some, either open to all travellers, or as others, reserved for particular castes (brahmins, *śūdra*, etc.).¹⁹ In Travancore there still existed recently along the roads chari-

13. The most celebrated of these are in Orattanāṭu, Niṭāmañkalam, VeṇṇāRu cattiram (to the south-east, east, north-east of Tañcāvūr), Tārācuram, Ammācat-tiram (west and north of Kumpakōṇam), Rājāmaṭam, MaṇamēRkuṭi and Mīm-pecal (on the coast, south of Paṭṭukkōṭṭai) (vide *M.D.M.*, *Tanjore*, 233-40).

14. Inscriptions frequently mention these diverse foundations and provide information regarding their statutes and management. Vide, for example, *Annual Reports on Indian Epigraphy*, 1922, No. 283; 1923, No. 579; 1925, No. 27; 1927, No. 96; 1928, No. 14; 1933, No. 64; 1939 (Bombay Karnatak), Nos. 108 and 109; 1949, Nos. 19, 20-2, 25; 1951, No. 84; 1959, No. 483; 1960, No. 87; 1961, Nos. 322, 521, 522.

15. He was reputed to have installed *satra* in all the villages and on the main roads of the realm during the second half of the seventeenth century.

16. *M.D.M.*, *Madura*, 140.

17. *M.D.G.*, *Tanjore*, 142. At the close of the eighteenth century many *cattiram* were to be found within a radius of 40 or 50 miles around Madrās, which had been erected at the expense of wealthy local merchants (Buchanan, *Journey*, vol. II, 528).

18. In the Nellūru district at the close of the last century, all the *satramu* were managed by the *zamindār*, their descendants or agents (*M.D.M.*, *Nellore*, 680).

19. In the list of *cattiram* in the Tirunelvēli district prepared at the end of the last century (*M.D.M.*, *Tinnevely*, 258-89), one has specified to which caste the different foundations were reserved. François Martin (*Mémoires*, t. II, 241) noted, 1681, in his journal: 'At that time large structures shaped like barns were found along the road from Golconde to Masulipatam every four leagues, where each day rice was cooked for all the brahmins who came and went on this route. This charity was to such an extent reserved for those of that caste, that not a drop of water would have been given as alm to other persons, Christians, Mohammedans, nor other gentiles'.

table establishments called *ūttupura*, where brahmins could be nourished for a period of three days; the most important was to be found at the Patmanābha temple in Tiruvananthapuram (Trivandrum).²⁰

In certain of these rest-houses, only lodging was offered, and it was thus prudent to have one's own provisions;²¹ in others, beverages were provided: fresh water, *kāñji*,²² i.e. rice water, or *nīrmor*,²³ i.e. butter-milk mixed with water. On the pilgrimage routes or in the proximity of holy places, meals were distributed gratis, at least to brahmins and wandering monks. In any case, travellers could generally avail of these establishments for but a single day.

As regards the equipping of the houses, the same diversity was to be encountered. Some were but simple shelters, left to the disposition of wayfarers, who had to accommodate themselves as best they could. Dirty and never cleaned, gentlefolk preferred, during the fair-weather season, the shade of a tree.²⁴ In yet others, there was at least a caretaker responsible for the property of the premises,²⁵ or indeed a brahmin cook who, for a small sum of money, could prepare a meal.²⁶

Regional Examples

In the Nellūru district of the last century, one found in the most important rest-houses persons responsible for the maintenance of the premises and at the service of travellers: a *gomastā* (agent of the *zamīndār*), who managed affairs, a brahmin cook, a *peōn*, a sweeper, a caretaker, and in addition sometimes one or two servants.²⁷

An idea of the *cattiram* in Tañcāvūr might be gained by consulting an investigation undertaken by the collector in 1873.²⁸ At that time, 694 charitable establishments were registered,²⁹ which for the most part were maintained by private individuals, excepting seventeen government institutions and the sixteen *rājā cattiram*. In 33 of them (ten of which were *rājā cattiram*) food was distributed gratis twice daily to all travellers without distinction of caste; in 179 (five of which were *rājā cattiram*), a meal was given to a determined number of brahmins only

20. *M.G.*, 613; *M.D.M.*, *Travancore State*, 525-8.

21. Duperron, *Zend*, t. I, I, XXXI.

22. *Kāñji* (H.), *gāñji* (Tel.), *kāñci* (Tam.).

23. *Nīrmor* (Tam.), water and butter-milk to which are added salt, lemon, ginger and leaves from the plant called *karuvēmpu* (*Bergera Koenigii*).

24. Heyne, *Tracts*, 16.

25. Degrandpré, *Voyage*, t. I, 143.

26. Buchanan, *Journey*, vol. I, 149.

27. *M.D.M.*, *Nellore*, 680.

28. *M.D.M.*, *Tanjore*, 230-2.

29. Without counting the innumerable *tiruvāccal* or *cāvai*, small edifices abandoned to poor travellers and mendicants.

on the twelfth day of the lunar month; 273 others were *taṇṇīrppantal*, only maintained during the hot season to slake the thirst of travellers; while the remaining 209 were but simple shelters.

The best administered were the *rājā cattiram*³⁰ intended principally for the Rāmēśvaram pilgrims. Disposing of prosperous finances based on the large personal properties (35,000 acres of land) and on the subventions provided by the Maratha princes, they were able to maintain diverse works. There was no restriction as to the duration of séjour nor upon the food distributed. Everyone could benefit from the meals prepared in different kitchens according to caste, or rations of uncooked food for those who wished themselves to prepare their own food. *Kāñji* was given to the mendicants mornings and evenings. In the mid-nineteenth century, after the state had become responsible for their management, a portion of the revenues was utilized to maintain schools and dispensaries within these establishments. This underlines the significance of the Rāmēśvaram route.

The Rāmēśvaram Pilgrimage Route

Of all the routes of the peninsula, that best provided with rest-houses was the southern section of the great axis of pilgrimage from Kāśī (Banāras) to Rāmēśvaram, which is quite well known to us, at least southwards of the Āndhra deltas. It was divided into two principal tracks, one following the coastline, the other linking the great temples in the interior. At the close of the preceding century, the different establishments lining the old roads of the Nellūru district were registered.³¹ For the districts of Ceṅkalpaṭṭu (Chingleput) and TeN Arkkāṭu (South Arcot) we are less well-informed and but few vestiges remain of these shelters except, in areas, on the coastal track between Madrās and the delta of the Kāvēri, and on sections of the interior route between Kāñci and TiṇṭivaNam, where they are numerous. In Tañcāvūr, where the other routes from the Deccan terminate, the old rest-houses are abundant along the littoral, and in the districts of Rāmanātapuram and of Tirunelvēli on the roads linking KaNNiyākumari and Rāmēśvaram.³²

These arteries, connected by smaller veins, form a veritable circulatory system through which flowed all the religious life of the Tamil country. The information which we have been able to glean, as well as

30. *M.D.M., Tanjore*, 233-40.

31. Vide the list in *M.D.M., Nellore*, 674-80.

32. *M.D.G. (Tinnevely)*, 258-89) lists the *cattiram* of the second half of the nineteenth century, and valuable details concerning the history of the various foundations. In *M.D.M. (Pudukkōṭai State, vols I and II)* and the recent *M.D.G. (Ramanathapuram)*, scattered but valuable information is to be found regarding these rest-houses.

the field research we have undertaken, show that these foundations, reflecting the traditional Hindu organization of rest-houses, have endured without great damage the upheavals of history; the military campaigns of the Mughals in the South, the Franco-English wars scarcely affected them. The religious circulation did not slacken. Consider how many princes and wealthy individuals constructed houses for pilgrims during the period when fortresses and trading posts were under siege. The multiplicity and diversity of these establishments during that era shows that the eighteenth century, which throughout India was a period of political decline, was for the Rāmēśvaram pilgrimage a kind of golden age.

b. SARĀE OF HINDUSTHĀN

To the north of the regions in which Dravidian languages are prevalent, the rest-houses, called *dharmaśālā*³³ were organized according to similar principles. In Maratha country at the close of the eighteenth century, they existed in all towns and in almost all villages. At the time of Moor's passage,³⁴ one had been constructed at Athnī which could lodge at least five hundred people. The information is meagre concerning these shelters, which were also very numerous in the religious centres and along the pilgrimage routes of Hindusthān, because the observers of Indian life in the northern plains under the Mughals were primarily interested in the *sarāe*³⁵ on the imperial highways.

These establishments were both pious or charitable foundations³⁶ and creations of the state. The role of private individuals has been

33. *Dharmaśālā* (Skt., H.), *dharmaśālā* (Mar.). The etymology of the word indicates its original religious function.

34. Moor, *Narrative*, 301-2.

35. *Sarā*, *sarāe*, *sarāy*, commonly *sarāt* (Pers., H.), mansion, palace, large edifice, rest-house. European travellers, many of whom had visited Persia, used the term *kārvān-sarāe*, caravan house, from which is derived *caravansérail* (French), *caravanserai*. In India, where the term generally used to designate a convoy of travellers (caravan) was *qāfilah*, one simply employed the word *sarāe*. These establishments have not been systematically studied by scholars. However Iqtidar Alam Khan has tried to fill in this lacuna in his recent writings on Mughal inns, particularly, 'The Karwansarays of Mughal India: A Study of Surviving Structures', *The Indian Historical Review*, Vol. XIV, Nos. 1-2 (July 1987 and January 1988), 111-137, especially 117, map of the structures explored along Mughal highways, 118-31, ground-plans of the *Kārwānsarāys* and pls. I-X, photos of some structures. The reader may refer to this excellent study which will supplement our presentation.

36. 'The majority of *caramossoras*', writes Manrique (*Travels*, vol. II, 100-01), 'are sometimes constructed at the cost of the surrounding villages, sometimes with the donations of princes or wealthy and powerful individuals who hoped thus to immortalise their name or alleviate their conscience'.

generally forgotten, excepting in areas where the toponymy has conserved the name of the donor. Thus, *Sarāe Ekdil*, to the south of Itāvā, owes its name to a caravanserai founded by a eunuch of the name Ekdil Khān.³⁷ B.K. Sarkar³⁸ has observed that many of the rest-houses have been constructed by the ancestors of wealthy Mārvarī, today noted for the numerous institutions they finance in almost all the religious towns of North India. Several names of the stages of journey mentioned by eighteenth century travellers, such as *Sarāe Ajīmal*, *Sarāe Jagadīś*, *Sarāe Mūlcand*, *Mulukcand*, *Badridās*, etc., clearly indicate that they are of Jain origin. The majority, however, remain for us anonymous.

On the other hand, literary sources speak profusely of the work of the Mughal sovereigns who directed the systematic construction of *sarāe* along the important routes.

The Policy of the Grand Mughals

Bābur states in his memoirs³⁹ that he had a relay installed every 18 *kuroh* with six post horses whose maintenance was the responsibility of local authorities. According to 'Abbās Khān,⁴⁰ Šer Šāh would have constructed 1,700 shelters, separated by two *kos*, in which two horses were always ready to bear messages. His son, Islām Šāh, is reputed to have doubled that number.⁴¹ These figures appear to be unreasonable or greatly exaggerated,⁴² if one imagines that these buildings were constructed of durable materials; but, they are more feasible if one considers that they refer to simple relays, summarily built with palms or in clay, intended to shelter the personnel and animals of the postal service, as had been the huts for couriers in Tavernier's time.⁴³ In any case, for the first Mughals the route was an instrument of government;

37. D.G.U.P.O., vol. XI, *Etawah*, 226.

38. B.K. Sarkar, *Inland Transport*, 42.

39. *Bābur-nāma*, 629-30.

40. *Tārīkh-i-Šer Šāhī*, in Elliot, *History*, vol. IV, 417-8, 424. One manuscript even gives the figure of 2,500 *sarāe* (*ibid.*, 417 n. 2).

41. *Tārīkh-i-Dā'ūdī*, in Elliot, *History*, vol. IV, 479-80. According to *Tārīkh-i-Khān Jahān*, Šer Šāh established relays so that he could each day receive news from the Indus, Āgrā and the farthest reaches of Baṅgāl; and Islām Šāh, to the purpose of being certain that the post functioned well, had sent to him each day, wherever he might have been, a turban and a handful of fresh rice from Sonārgām (Elliot, *History*, vol. IV, 418 n. 1, 479 n. 3).

42. 'Senseless lying', says Elliot (*History*, vol. IV, 418 n. 3). 1,700 *sarāe* every two *kos* would represent 3,400 *kos* or 6,800 road miles. So many brick buildings could not have been constructed during such a short reign. If, furthermore, that were to be true, one would have discovered vestiges. Probably, it has to do with hurried constructions in perishable materials.

43. Tavernier (*Travels*, vol. I, 233) states, in fact, that every two leagues, i.e. every *kos*, small huts were to be found where couriers were posted.

the development of rest-houses was to have facilitated the transmission of instructions, and also the imperial caravanserais, born of postal relay stations, were the fruit of political design.

Šer Šāh's successors only further developed, with more powerful resources, the organization of the great Paṭhān sovereign. 'Since the time of Humāyūn', wrote Manucci,⁴⁴ 'many more *sarāe* have been built upon the royal highways throughout the realm, from one end of it to the other'. From Akbar to Aurangzeb, emperors, empresses (Nūrjahān in particular), provincial governors, undertook grandiose constructions to satisfy the needs of administration and large-scale commerce.

Post houses, hostelries for government agents on tour, and for the emperor himself when travelling, these buildings were fortified places which sheltered the police forces charged with the protection of the main roads. And above all, with their depots where diverse goods and wares were stored, they were active markets to which the peasants from the surrounding villages came to sell their agricultural products.⁴⁵

During the Mughal era of peace the caravanserais were thus vital organs in the system of land communications and transport.

Types of Rest-houses

They were not built according to a uniform style or plan; their construction varied from region to region, and in relation to the importance of the traffic as well as the interest of the sovereigns or patrons. Tavernier⁴⁶ states that the most common among them consisted only of a large enclosure of walls and hedges, within which some fifty or sixty thatch-roofed huts of clay were grouped. Frequently however, they were *pakkā* structures built of brick, stone and, in some parts of the building, of marble. They usually consisted of a large courtyard open to the heavens, square or rectangular, surrounded by high walls with one or several towers, massive arched doorways (generally two such, more rarely, four), flanked by guard-rooms. Along the walls, in the interior, were arranged a series of slightly raised rooms of sufficient size to shelter a man and his baggage or wares. The space in the centre was reserved for cattle.

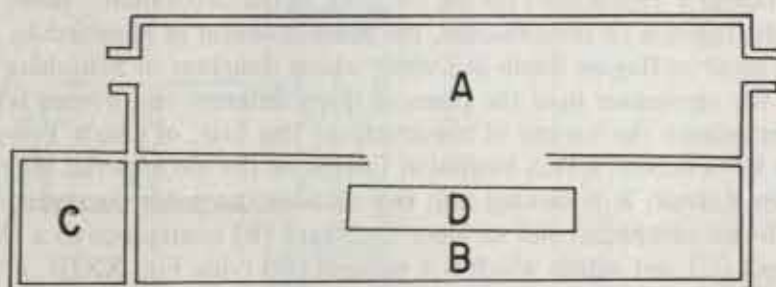
Bādsāhī Sarāe

Some of these rest-houses earned the admiration of travellers, especially the imperial *sarāe* (*bādsāhī sarāe*). The *Nūrmahal-kī-sarāe*, at the entrance to Āgrā, was constructed entirely of stone with vaulted rooms surmounted by domes and could lodge from 2,000 to 3,000 persons and

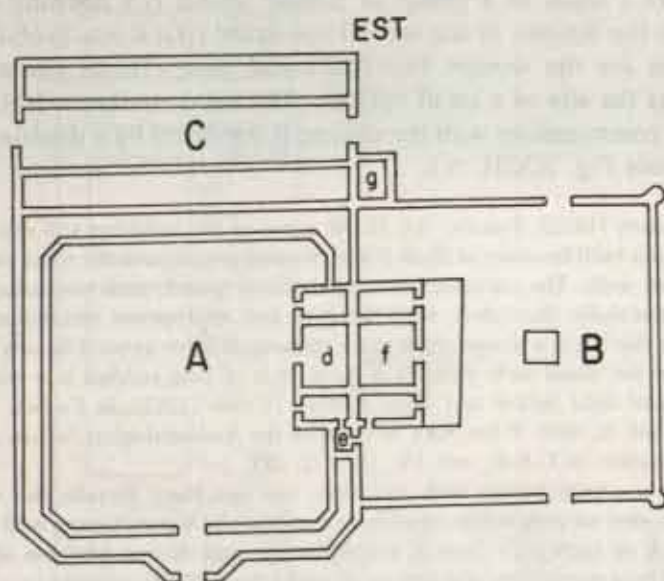
44. Manucci, *Storia*, vol. I, 114-5.

45. Qanungo, *Sher Shah*, 391-2.

46. Tavernier, *Travels*, vol. I, 45.



a.



b.

XXIII. *Sarāe* lining the Kaśmīr route, between Bhīmbar and Rājaurī: a., *sarāe* at Caṅgas, on the bank of the Tavī River: A., outer courtyard; B., inner courtyard; C., tower; D., mosque (plan by R. Temple, *Journals*, vol. II, 9); b., *sarāe* at Saiyidābād: A., B., C., courtyards; e., passage; d. and f., rooms; g., mosque (plan by F. Drew, *Northern Barrier*, 101).

shelter some 500 horses.⁴⁷ That at Jājau, to the north of Dholpur, was particularly appreciated for the elegance of the decoration;⁴⁸ however, in the opinion of connoisseurs, the most beautiful in Hindusthān was the *sarāe* of Begam Šāhib in Dehlī,⁴⁹ eldest daughter of Šāhjahān.

We reproduce here the plans of three different rest-houses which demonstrate the variety of construction. The first, of which Temple⁵⁰ has left a sketch, is that located in Caṅgas on the old imperial highway from Kaśmīr. It is divided into two sections: an outer courtyard (A) with two entrances, and an inner courtyard (B) contiguous to a tower annex (C) and within which is a mosque (D) (vide Fig. XXIII, a.).

That at Saiyidābād, of which Drew⁵¹ made a summary plan, located on the same route as the former, is much more elaborate. It contains three large courtyards. Passing through the main entrance, one reaches the first (A), the interior of which is bordered on all sides with small vaulted rooms. In the middle of the southern side are three larger rooms (d.) at a slightly higher level, which must originally have been covered by a storey intended for the emperor. From there a narrow passage (e.) leads to a group of similar rooms (f.) opening onto a terrace in the interior of the second courtyard (B); it was probably the apartment for the women (*zanānah*) and their private garden; (g.) represents the site of a small mosque. The third courtyard (C), which does not communicate with the others, is bordered by a double row of rooms (vide Fig. XXIII, b.).

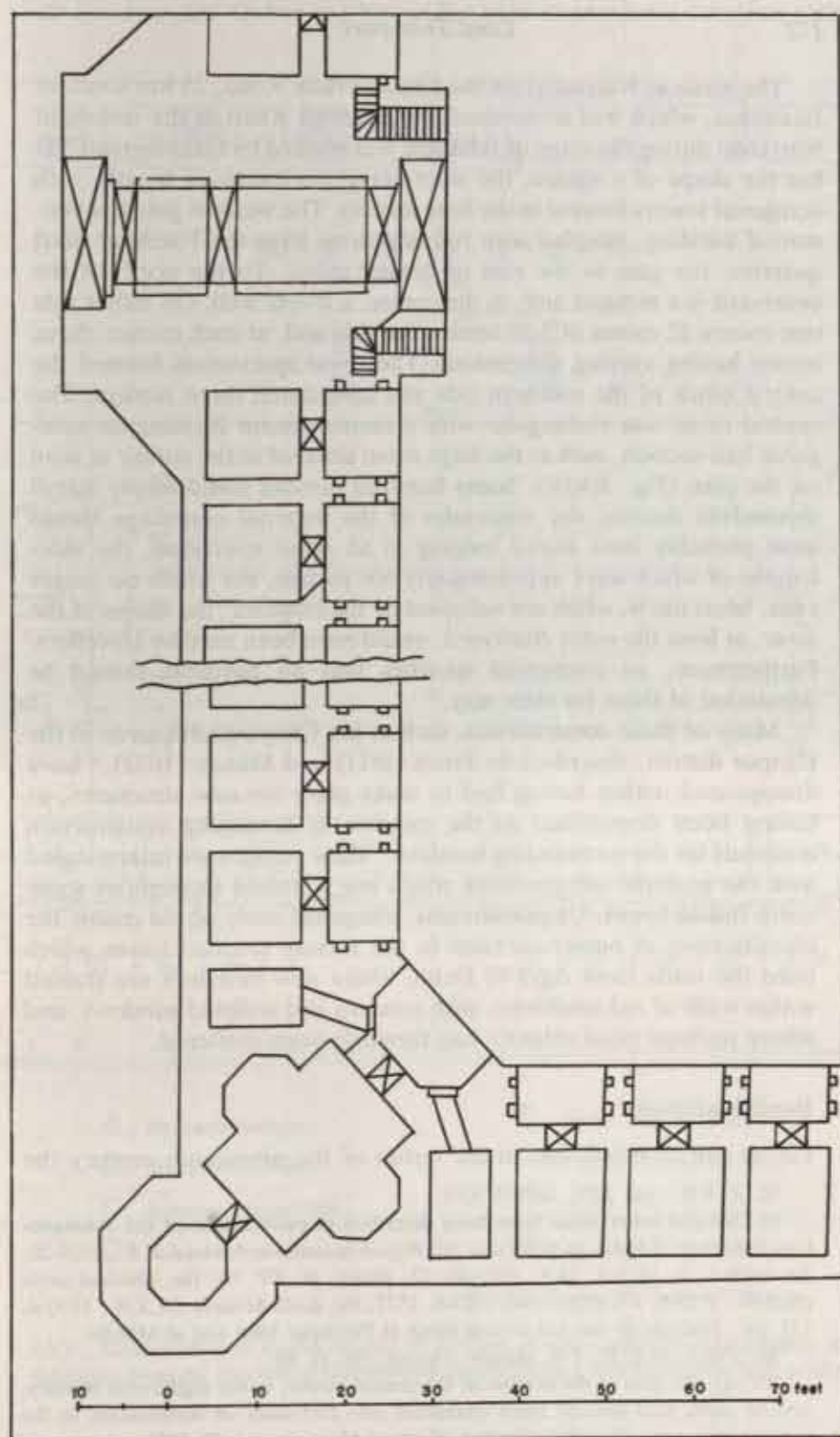
47. Mundy (1632), *Travels*, vol. II, 78; some of the buildings still exist.

48. 'Sarai built by order of Shah Jahan, beyond comparison the most elegant he had yet met with. The entrances are uncommonly grand, each consisting of two minarets tastefully decorated, with the gate and appropriate ornaments in the centre. On the left is a musjeed not more remarkable for general beauty than for delicacy of the stone with which it is built. It is of pale reddish hue inlaid with ornaments of light yellow and white marble' (Cruso (1781), in Forbes, *Oriental Memoirs*, vol. II, 409). It has been restored by the Archaeological Survey of India. Vide description in C.S.R., vol. IV, 1871-72, 213.

49. 'It is a large square with archways, like our Place Royale, but with this difference, that an arch is separated from the other by a partitioning wall and that in the back of each arch there is a small room, and that in addition above the archways there is a gallery which runs all round the building to enter into as many upper apartments as there are lower. This *serrah* is the meeting-place of great Persian merchants, Usbeks and other foreigners who generally find here quite comfortable vacant rooms where they might stay some time in great security, the door being closed every evening. If there were to be some twenty suchlike accommodations in different areas of Paris, foreigners newly arriving would not be so ill-put as they frequently are to find a secure lodging for themselves' (Bernier, *Voyage*, t. II, 61-2; *Travels*, 281; Manucci, *Storia*, vol. I, 212). Unfortunately, this building no longer exists, having been destroyed subsequent to the 1857 revolt. On its former site stands today the *Delhi Institute* (Carr, *Delhi*, 256-7).

50. Temple, *Journals*, vol. II, 9; in 1859 it was already in ruin.

51. Drew, *Northern Barrier*, 101-2.



XXIV. *Bādsāhi-sarāe* at Nūrmahāl (according to C.S.R., vol. XIV, pl. XXI).

The *sarāe* at Nūrmahāl on the Grand Trunk Road, 25 km south of Jālandhar, which was constructed by Zakariyā Khān at the orders of Nūrjahān during the reign of Jahāngīr, was studied by Cunningham.⁵² It has the shape of a square, the sides being 165 metres in length, with octagonal towers located in the four corners. The western gate is a two-storied building, mantled with red sandstone from the Fatehpur Sikrī quarries; the gate to the east no longer exists. To the north of the courtyard is a mosque and, in the centre, a lovely well. On either side one counts 32 rooms of 3.30 metres the side and, at each corner, three rooms having varying dimensions. The royal apartments formed the central block of the southern side and constituted three storeys. The central room was rectangular with a reinforcement forming an octagonal half-section, such as the large room situated in the corner as seen on the plan (Fig. XXIV). Some hundred persons could amply install themselves therein; the remainder of the imperial entourage would most probably have found lodging in an outer courtyard, the side-lengths of which were approximately 600 metres, but which no longer exist. Most likely, when not occupied by the emperor, the rooms of the *sarāe*, at least the outer courtyard, would have been used by travellers. Furthermore, an inscription specifies that no payment should be demanded of them for their stay.⁵³

Many of these constructions, such as the Chaparghattā *sarāe* in the Kānpur district, described by Finch (1611) and Mundy (1632),⁵⁴ have disappeared; either having had to make place for new structures, or having been demolished to the purpose of furnishing construction materials for the surrounding hamlets.⁵⁵ Their vestiges are intermingled with the multiple substructions which are scattered throughout some north Indian towns. Unquestionably, a regional study would enable the identification of numerous ruins in the ancient fortified towns which lined the route from Āgrā to Dehlī, where now buffaloes are stabled within walls of red sandstone, with columns and sculpted windows, and where perhaps royal retinues had formerly been sheltered.

Bardāst-khānah

Let us call to mind, that at the outset of the nineteenth century the

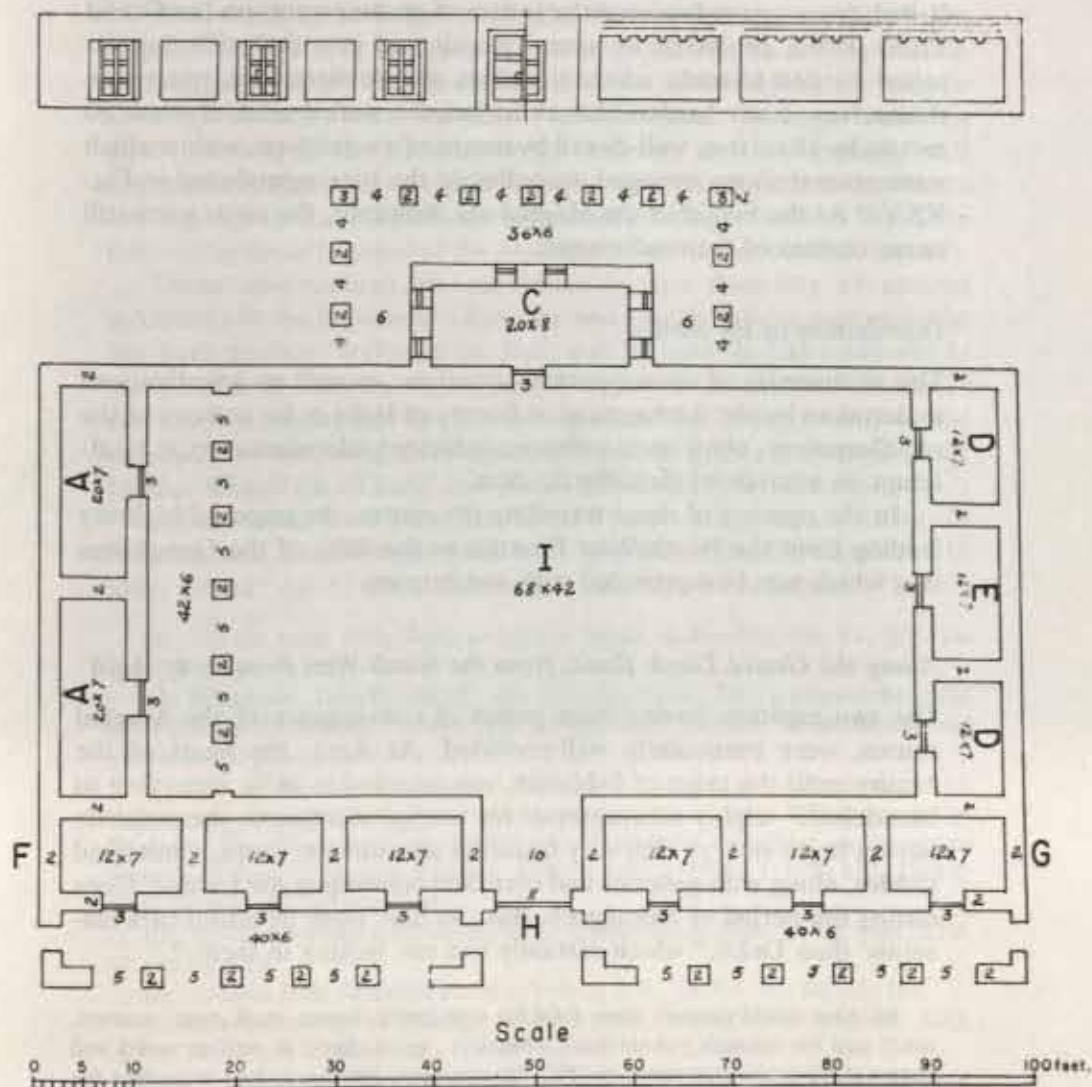
52. C.S.R., vol. XIV, 1878-9, 62-5.

53. Several other *sarāe* have been described in publications of the Archaeological Survey of India, in particular the *Begam-kī-sarāe* in Aṭak (A.S.R., 1919-20, 20; 1920-1, 3; 1928-9, 24-5; 1929-30, 32, photo, pl. IV, b); the *Dakhinī-sarāe* (A.S.R., 1925-6, 17; 1926-7, 17; 1927-8, 1527; the *Badlī-kī-sarāe* (A.S.R., 1930-4, 12), etc. Tourists do not fail to visit those at Fatehpur Sikrī and at Māṇḍu.

54. Finch, in E.T., 179; Mundy, *Travels*, vol. II, 89.

55. At the time of the decline of the central power, in the eighteenth century, several *sarāe* had already been converted into fortresses or warehouses in the regions under the Marathas (Forbes, *Oriental Memoirs*, vol. II, 195).

Half Elevation, half Section and Plan of Burdasht-Khanah in the Cawnpore District.



A. Bhoosah Godown.

B. Charcoal and Pots.

C. Supplies served from

D. Rooms for contractors.

E. Room for Mirduhas.

F to G. Six Buneach shops.

H. Gate.

I. Open space for wood.

J.E. Hussey, supdt. District Roads.

XXV. *Bardast-khānah* in the district of Kānpur, in 1847 (plan by J.E. Hussey, in *Selections from the Records of Government, North-Western Provinces*, vol. V, f. p. 63).

British government favoured the system of encampments on the Grand Trunk Road, protected by armed guards and provided with depots, called *bardāst-khānah*, where travellers and soldiers could provision themselves. Each *bardāst-khānah* included a walled area of some 30 metres by 18 metres, well-closed by means of a solid door, within which were several shops arranged according to the plan reproduced in Fig. XXV.⁵⁶ At the height of the Mughal era, however, the *sarāe* were still nerve centres of the road system.

Distribution of the Sarāe

The testimonies of contemporary travellers, as well as investigations undertaken by the Archaeological Survey of India or by authors of the old *Gazetteers*, allow us to collocate sufficient information so as to attempt an analysis of their distribution.

In the opinion of those travelling the routes, the imperial highway leading from the North-West Frontier to the delta of the Gaṅgā was that which was best provided with rest-houses.

Along the Grand Trunk Road, from the North-West Frontier to Āgrā

The two capitals, having been points of convergence of the Mughal routes, were particularly well-provided. At Āgrā, the heart of the empire until the reign of Śāhjahān, one counted in 1638, according to Mandelslo,⁵⁷ 'eighty caravanserais for foreign merchants, the majority having three storeys with very beautiful apartments, shops, vaults and stables, along with galleries and corridors connecting the rooms'. Even during the period of Aurangzeb, this city had 'more beautiful caravanserais' than Dehlī,⁵⁸ which certainly was not lacking in them.⁵⁹

56. One could procure there food for men (milk, butter, curd, eggs, mutton, fowl) and for animals (wheat husk - *bhūsā* - , grass, hay), as well as wood and charcoal for fires, clay pots, etc. (R. Montgomery, 'Memorandum regarding the Trunk-Road', 17 April 1847, in *Selections from the Records of Government, North-Western Provinces*, vol. V, 56-63).

57. Mandelslo (*Voyage*, in *Hist. Gén. des Voyages*, t. 37, 211-2); vide also Jourdain, *Journal*, 164. Information confirmed by Modave (*Voyage*, 195) at the close of the eighteenth century: 'One sees there a prodigious number of old palaces, ruins of caravanserais...'

58. Bernier, *Voyages*, t. II, 67; *Travels*, 284.

59. Modave (*Voyage*, 232) wrote in 1775: 'One sees there five or six buildings forming an enclosure separated from the other structures and which are intended for the lodging of foreign merchants. They are designated by the name of the country of those who usually lodge there. They are veritable caravanserais. There is that of Samarcande, then of Tibet, and Caboul. The most magnificent of all is that of the Begum...' The latter has been described by Bernier (vide *supra*, 170 n. 49).

They were to be found at regular intervals on the north-western segment from Kābul to Āgrā, as well as on the branch linking Multān with Lāhaur. 'Every five or six *kos* there is a *sarāe* built by the king or some great men', observed Steel⁶⁰ in 1616. And Manrique⁶¹ adds in 1640: 'Several of the latter are very attractive and are specially well constructed; sometimes we cannot find a vacant room, this being due to the throngs of travellers of all sorts and conditions who at this time follow this route because of the presence of the royal court at *Lāhaur*'.

These observations are confirmed by the discovery of ancient structures in the regions of Jālandhar and Ludhiyānā, as well as in the Mathurā district.⁶² Between the Byās and Sarhind the old route was in fact lined with beautiful caravanserais located in Sulṭānpur,⁶³ Dakhinī⁶⁴ (at 20 km), Nūrmahal⁶⁵ (at 20 km), Phillaur⁶⁶ (at 20 km), and, on the other side of the Satlaj, in Ludhiyānā⁶⁷ (at 14 km), Dorāhā⁶⁸ (at 20 km), Laṣkar Khān⁶⁹ (at 10 km), and finally in Khannā⁷⁰ (at 13 km).

On the route from Dehlī to Mathurā they were generally nearer to one another, and vestiges have been found at Hoḍal,⁷¹ Kosi⁷² (at 13 km), Chātā⁷³ (at 13 km), Caumuhā⁷⁴ (at 15 km), 'Azamābād⁷⁵ (at 15

60. On the route from Āgrā to Lāhaur (Steel, in *Purchas*, vol. IV, 268; De Laet, *De Imperio*, 55).

61. Manrique, *Travels*, vol. II, 184. He adds (*ibid.*, 221) à propos the route from Lāhaur to Multān: 'everywhere we met with excellent *caramossoras* and provisions at good prices'.

62. Neither should the celebrated *Begam-kī-sarāe* in Aṭak be forgotten, which dated from Jahāngir's epoch and consists of a courtyard some 100 metres wide. Wheeler (*Five Thousand Years of Pakistan*, 93-4) states that there are numerous vestiges of these building in Pakistan. Vide *A.S.R.*, 1919-20, 3; 1920-1, 3; 1928-9, 24-5; 1929-30, 32 and pl. IV, b.

63. It was constructed during the reign of Aurāṅzeb. Vide *C.S.R.*, vol. XIV, 57 and pl. XIX.

64. It dates from Śāhjahān's times. Vide *A.S.R.*, 1925-6, 17; 1927-8, 152.

65. It was built under Jahāngir. Vide *C.S.R.*, vol. XIV, 62-5 and pl. XXI; *A.S.R.*, 1925-6, 17; 1926-7, 17; 1927-8, 16.

66. It was erected during the epoch of Śāhjahān. Vide *P.D.G.*, vol. XIV, A, *Jullundur*, 301.

67. It disappeared long ago, but at the beginning of this century, there were several others which were private foundations. Vide *P.D.G.*, vol. XV, A, *Ludhi-ana*, 33.

68. *Ibid.*, 33.

69. A magnificent *sarāe* constructed during the time of Aurāṅzeb and quite well conserved (*ibid.*, 33).

70. The walls remain (*ibid.*, 33).

71. Beautiful *sarāe* in ruin (*P.D.G.*, vol. IV, A, *Gurgāon*, 249).

72. It forms the nucleus of the city; the principal market street traverses it in its entire length, between the two old gates (*D.G.U.P.O.*, vol. VII, *Muttra*, 73).

73. It was quite well preserved at the beginning of this century (*ibid.*).

74. But little remained some 60 years ago (*ibid.*).

75. It was the largest of all; demolished in part in 1875, its materials were used

km), finally in Jamālpur⁷⁶ (at 3 km), near to the Mathurā railway station).

From Āgrā to the Gangetic Delta

The same organization of rest-houses was to be found between Āgrā and Baṅgāl. As was observed by Manrique⁷⁷ in 1640, 'this route is lined with dwellings, large towns and small villages and it is much frequented by travellers. For which reason it is well provided with *caramossoras*, several of which are famous, constructed at great expense by wealthy individuals or by personages of high rank'. The toponymy has retained the memory⁷⁸ and ruins remain in the Doāb, at Sarāe Ekdil,⁷⁹ Sarāe Ajitmal⁸⁰ (at 30 km), Sikandrā⁸¹ (at some 40 km), Zāinpur (at 12 km), Chaparghattā⁸² (at approx. 30 km), Bāndā (at 20 km), Ghātampur (at 5 km), Pāras (at 8 km), Naurāṅga (?),⁸³ Khajuhā⁸⁴ (at 35 km), Fatehpur⁸⁵ (at 33 km), Bilandā⁸⁶ (at 6 km), Sarāe Mandā⁸⁷ (at 18 km) and at Cunni-kī-sarāe⁸⁸ (some 20 km farther).

to pave the streets. The very deep foundations remain (*ibid.*).

76. At the beginning of this century, it served as a police station (*ibid.*). According to local tradition, the third, fourth and fifth *sarāe* were reputed to have been built by Śer Śāh; but, it is also said that E'tibār Khān founded those at Mathurā and Kosi, and Āṣaf Khān that at Chātā. The *sarāe* at 'Azamābād is attributed to Prince 'Azam, Aurāṅzeb's son, but is probably the work of a local governor, 'Azam Khān Mīr Muḥammad Bāqir, *Faujdar* of Mathurā from 1642 to 1645 (Growse, *Mathura*, 29-31).

77. Manrique, *Travels*, vol. II, 146. Same observation in Manucci (*Storia*, vol. II, 89) and in Mundy (*Travels*, vol. II, 99): 'good accommodation for travellers, as many faire saraes and tancks all the way'.

78. Vide in particular the stages mentioned by Mundy (*Travels*, II, 78-187) and by Marshall (*Notes*, 160).

79. It was constructed in 1632 by Ekdil Khān (*D.G.U.P.O.*, vol. XI, *Etawah*, 226; *M.A.I.N.W.P.O.*, 92).

80. Ajitmal Kāyasth built it during the reign of Śāhjahān (*ibid.*, 179).

81. *D.G.U.P.O.*, vol. XIX, *Cawnpore*, 341.

82. This magnificent *sarāe*, described by Finch (in *E.T.*, 179) and by Mundy (*Travels*, vol. II, 89), has been demolished.

83. These different establishments located in the Ghātampur *tahsil* have fallen to ruin; only the foundations remain (*D.G.U.P.O.*, vol. XIX, *Cawnpore*, 86-7).

84. Constructed by Aurāṅzeb, it had a surface area of ten acres, including 130 vaulted rooms, a mosque, two two-storeyed gates, surmounted by minarets (*D.G.U.P.O.*, vol. XX, *Fatehpur*, 73 and 243; *M.A.I.N.W.P.O.*, 162).

85. It has been described by Heber (*Narrative*, vol. II, 26-7).

86. Called Sarāe Saiyid Khān, after the name of its founder, it was demolished at the time of the construction of the present road (*D.G.U.P.O.*, vol. XX, *Fatehpur*, 73 and 179).

87. *D.G.U.P.O.*, vol. XX, *Fatehpur*, 73.

88. *Ibid.*

To the east of Ilāhābād, the Archaeological Survey of India has only found a few, in Naubatpur⁸⁹ (at 41 km east-south-east of Banāras), in Dāūd-nagar on the banks of the Son River,⁹⁰ in Muṅger,⁹¹ Rājmaḥal⁹² and in Dhākā.⁹³ However, they were in fact once as numerous as those on the western segment.

Thus the Mughal Grand Trunk Road benefited from a remarkable system of rest-houses, well-adapted to long-distance travel. In the nineteenth century, new *sarāe* were constructed and all the settlements of any importance along this route had one or several, always open to travellers, down to the creation of the railway which struck them a serious blow.⁹⁴

Along the Kaśmīr Route

The sovereigns were particularly attentive as regards the Kaśmīr route. It is known that there were no caravanserais in the Śrīnagar basin.⁹⁵ Jahāngīr noted in his memoirs⁹⁶ that he had given orders to construct at each stage of the route buildings intended to shelter the emperor and the harem. Several of these *sarāe* still exist today and, if they were to be somewhat maintained, could be used by travellers.⁹⁷ R. Temple, in 1859 noted those to be found between Bhīmbar and the Pīr Pañjāl Pass;⁹⁸ leaving Bhīmbar, in Saiyidābād (at 24 km), on the roadside somewhat farther on in Nauṣahrā (at 20 km), at two other places near the Tavī River, in Caṅgas Sarāe (at 22 km), Rājaurī (at 24 km), Thannā (at 22 km), at the exit of Bahrāmgala (at 16 km), Puṣiyānā (at 16 km)

89. *M.A.I.N.W.P.O.*, 212.

90. A fortified *sarāe* constructed by Dā'ūd Khān during the epoch of Aurāṅzeb (*L.A.M.B.*, 334; *A.R.B.*, 97). Mundy (*Travels*, vol. II, 159 and n. 2) saw in Paṭnā 'the fairest sarāe that I have yett seene in India', which would have been the *madrasah* of Saif Khān (vide *A.R.B.*, 414).

91. It was called 'Begusarāe' (*A.R.B.*, 36).

92. This *sarāe* has been described by Hodges (*Travels*, 32); it would have been constructed by Sulṭān Sujā'.

93. At Dhākā towards the end of the last century, two *kaṭrā* utilised by travellers were noted: the grand *kaṭrā*, built in 1645, very well preserved with its massive walls, and the small *kaṭrā*, erected by Šāistah Khān somewhat later, which is almost intact (*L.A.M.B.*, 198).

94. The old *District Gazetteers* mentioned them regularly, especially those in the Pañjāb (*P.D.G.*) and the United Provinces (*D.G.U.P.O.*) which treated of the subject with substantial information; whereas, those of the former province of Baṅgāl (*B.D.G.*) attached much less importance to this question.

95. As Forster stated (*Journey*, vol. II, 32-3), the foreign merchants lodged with their *kaśmīrī* agents.

96. *Tūzuk*, vol. II, 178.

97. *A.S.R.*, 1919-20, 32.

98. R. Temple, *Journals*, vol. II, 3-10, 15, 20, 22, 27.

and in 'Alīābād on the other side of the pass (at 17 km); there being twelve caravanserais along 161 km, which represents an exceptional development.

Elsewhere in the Northern Plains

One also has the impression that the main route from Baṅgāl to Orīṣā was foreseen with numerous shelters for pilgrims,⁹⁹ but these have not been surveyed. On the other hand, in the principality of Avadh, a number of structures have been found which testify to the interest taken by local princes in the lodging of travellers.¹⁰⁰

On the Roads leading to the Gulf of Khambhāt

To the south of the grand axis, the route from Surat via Burhāmpur, which traversed the imperial territories, was well provided with rest-houses, particularly between Āgrā and Siroṇj, as indicated by the toponymy (the place-names composed with 'sarāe' are quite common there), as well as by archaeological studies. Vestiges remain of these buildings in Kacnār (north of Siroṇj)¹⁰¹ and in Magronī (6 km north of Narvar),¹⁰² and two very beautiful *bādsāhī sarāe* have been restored in Nūrābād¹⁰³ and in Jājau.¹⁰⁴ Along the desert track passing through the *rājput* principalities, conversely, there was practically no shelter except on the segment linking Āgrā and Ajmer,¹⁰⁵ and travellers had to camp in the open.¹⁰⁶ They only encountered caravanserais in large towns on the Gulf of Khambhāt, such as Aḥmadābād¹⁰⁷ and Surat.¹⁰⁸

99. Vide Ray, *Orissa*, 154.

100. In Gorakhpur; Bisvān (35 km east of Sītāpur); Nighāsan (38 km north of Khirī); Majholī (24 km north-west of Sītāpur); Gondā; Chibramau (27 km south-west of Fatehgarh); Khudāgañj (22 km south-east of Fatehgarh); Akbarpur (57 km south-east of Faizābād); Fatehābād (33 km south-east of Āgrā); Sarāe Aghāt (68 km south-east of Etā). Excepting the last three, they all date from the eighteenth century (*M.A.I.N.W.P.O.*, 242, 287, 289, 304, 77, 81, 300, 70, 88).

101. *C.I.S.G.*, *Gwalior State*, vol. I, 247.

102. *Ibid.*, 263.

103. Constructed during the reign of Jahāngīr, it originally contained 84 rooms (*ibid.*, 276; *C.S.R.*, vol. II, 397).

104. Remarkable for the elegance of its construction, it dates from the epoch of Šāhjahān (*C.S.R.*, vol. IV, 213).

105. According to Withington (in *E.T.*, 225), a caravanserai was to be found every ten *kos*; there was a beautiful one in Fatehpur Sikrī (*M.A.I.N.W.P.O.*, 74).

106. Mundy (*Travels*, vol. II, 248, 264), missing the conveniences of the road from Āgrā to Patnā, where the rest-houses were met at each stage, noted in 1633 that it was difficult to find a *sarāe* during twelve days of journey.

107. Della Valle, *Travels*, vol. I, 95; Thévenot, *Travels*, 12.

108. Forbes, *Oriental Memoirs*, vol. I, 250; Stavorinus, *Voyages* (Engl. edition), vol. II, 477.

Between these two lines, the secondary routes were but badly provided. T. Roe,¹⁰⁹ recounting his journey from Māṇḍu to Ajmer in 1615, does not cite a single rest-house, and Modave, travelling from Āgrā to Koṭā in 1776, passed all his nights outside.¹¹⁰ That would indicate that the cross-country roads benefited but little from the generosity of the great or of the state.¹¹¹

In the Deccan

Some of the large towns of the Deccan had magnificent caravanserais. Thus, in a suburb of Aurangābād, Harsul, three *sarāe* existed which had been constructed by Aurangzeb. One of them consisted of 192 vaulted rooms.¹¹² In Haidarābād, according to Tavernier,¹¹³ one found some which were two-storied, having large rooms which were always cool. According to Bowrey,¹¹⁴ in the Gōlukonḍa kingdom at the close of the seventeenth century, the shelters were remarkably deployed: there were small houses every 9 or 10 km where one could receive milk and *kāñjī* at the king's expense, and every 20 km there were shelters where everyone could lodge, constructed and maintained by the state; which raises the question of their organization.

Organization

Little is known regarding the management of the *sarāe*. According to 'Abbās Khān, it was Śer Śāh who would have been responsible for their administration: 'In every sarai he built separate lodgings, both for Hindus and Musulmans, and at the gate of every sarai he had placed pots full of water, that anyone might drink; and in every sarai he settled Brahmins for the entertainment of Hindus to provide hot and cold water, and beds and food, and grain for their horses; and it was a rule in these sarais, that whoever entered them received provision suitable to his rank and food and litter for his cattle, *from the government*. Villagers were established all round the sarais. In the middle of every

109. *Embassy*, second edition, 81-4.

110. 'The inconveniences of travel are not little. One finds almost nowhere aldeas, and one must be determined not only to eat very badly, but what is more, to pass most of the nights beneath the stars' (Modave, *Voyage*, 477).

111. Nevertheless, one could find in certain places marks of imperial benevolence, as for example in Dāhod (Dohad), where Śāhjahān had a *sarāe* constructed to commemorate the birth of Aurangzeb (*R.L.A.R.B.P.*, 98).

112. *L.A.R.N.T.*, 12.

113. Tavernier, *Travels*, vol. I, 123. He adds, that in the suburbs of the city several mosques provided caravanserais to strangers. Vide also Thévenot, *Travels*, 133.

114. *Geographical Account*, 177.

sarai was a well and a masjid of burnt brick; and he placed an *imām* and a *mua'zzin* in every masjid, together with several watchmen; and *all these were maintained from the land near the sarai*.¹¹⁵

Manucci¹¹⁶ specifies the ingenuous method by which Šer Šāh recruited personnel responsible for the reception of travellers: he is said to have purchased a large number of married slaves which he distributed among the different establishments, instructing them to conduct themselves with the travellers as if they were their own servants, to provide them with all which they required (water, bed, meals, etc.).

At the King's Expense

In other words, these institutions would seem to have had a twofold financial basis: on the one hand, the revenues from landed properties allocated to them by their founders; and on the other (at least as regards the *bādsāhī sarāe*), subventions from the state. Perhaps at their inception travellers, and in any case touring functionaries, were lodged and nourished gratis. However, as Manucci states,¹¹⁷ it is clear that feeding and bedding could not have been gratis for a long time, for that would have represented too great a burden for the majority of the foundations. Apparently, each *sarāe* disposed of sufficient resources to maintain the premises and remunerate the personnel, but the travellers had to make their contribution, paying a rent for certain objects commonly used in everyday life, as well as for services rendered by the employees, following a system that could not have greatly differed from that of the present-day *Travellers' Bungalows*, where the attendants, who receive a modest salary from the government, accept to cook or provide other services in return for a small sum of money.¹¹⁸

115. *Tā'rikh-i-Šer Šāhī*, in Elliot, *History*, vol. IV, 417-8. Elsewhere (*Tā'rikh-i-Dā'udī*, in Elliot, *History*, vol. IV, 480), it is said that his son, Islām Šāh, was to have distributed gratis food to the poor in each *sarāe*.

116. Manucci, *Storia*, vol. I, 114-5.

117. *Ibid.*, 115.

118. This, at any rate, is what the European travellers would give to understand. The personnel of the *sarāe* contented themselves with a small remuneration for room cleaning, installation of the bedding and preparation of food. Manrique (*Travels*, vol. II, 103) specifies that in Orisā, in 1640, one paid one or two *debua* (*dabba*) or *paisā*. Mundy (*Travels*, vol. II, 120), in 1632, indicates the same amount in the Doāb, as well as Thévenot (*Travels*, 132) in Haidarābād (in 1666 he rented two rooms in the most luxurious *sarāe* for two rupees the month). In the Gangetic Plain, Forster (*Travels*, vol. I, 75) notes in 1783 that his daily expenditures were so derisory, that on some days he could order a feast, paying two or three pence more. Malet, in Gvāliyar in 1785, remarked that for two *paisā*, or one penny, the poorest traveller received a bed, bread and water (Forbes, *Oriental memoirs*, vol. II, 404): proof that the globe-trotter, Thomas Coryat (1614-17), did not exaggerate when in a letter to his mother he said to live in Hindusthān for two pence a day (*ibid.*, 404-5).

Every traveller entering a caravanserai could benefit from a room for himself and his entourage, and a certain space to store his merchandise and tie his animals. Once he had taken possession, he could not be dislodged and those arriving after him had to content themselves with the other vacant rooms.¹¹⁹

At the traveller's disposition were a certain number of employees, varying according to the importance of the rest-house. Firstly, the *Mehtar* and *Mehtarānī*,¹²⁰ or sweepers, who watched over the property of the premises and could eventually provide a trestle or rope bed to whom so desired; ordinarily, travellers carried with them their bedding, quilts (*raḡā'ī*) or covers (*guḍrī*).¹²¹ Then, there were the *Bhaṭhiyārā* and *Bhaṭhiyārī*,¹²² who prepared the meals, and the *Kahār*, or water-bearers.¹²³ To which must be added an entire assorted world of small merchants vending hay, grains for the pack animals, offering supplies and provisions, cloth, as well as ostlers, smithies, barbers, tailors, doctors, musicians and dancers, without omitting prostitutes.¹²⁴

It would be necessary to differentiate this setting, which concerns principally the imperial *sarāe*. The rest-houses were not everywhere organized in the same manner. Thus in Mālava or Gujarāt, according to Terry,¹²⁵ one had to convey with oneself provisions and cooking utensils, as such things were not to be found in the caravanserais. In many areas one was content with the provision of food, camping near villages,¹²⁶ or lodging with inhabitants.¹²⁷ The observations made by

119. Steel, *Journals*, 268.

120. *Mehtar* (Pers., H.): the word signifies 'prince', but is applied derivatively to those of lower cast, such as sweepers; *Mehtarānī* (H.), woman sweeper.

121. Manrique, *Travels*, vol. II, 101; Forbes, *Oriental Memoirs*, vol. II, 404; Hobson-Jobson, 722, 386.

122. According to a tradition recorded in Bihār, the *Bhaṭhiyārā* would have been organized by Śer Śāh, when he established the *sarāe* throughout the country (Martin, *Eastern India*, vol. II, 449).

123. Mundy, *Travels*, vol. II, 120-1.

124. Manucci, *Storia*, vol. I, 114-5.

125. Terry, in *E.T.*, 311; same observation in Mandelslo, *Voyages*, Engl. edition, 65.

126. In the old *District Gazetteers* information is generally to be found concerning these camp areas, which could have been used by travellers provided with tents and bedding. Vide in particular *M.D.M.*, *Nellore*, 680-6. and *Salem*, vol. II, 49, 121, 198, 256, 282-90, 321.

127. Anquetil Duperron (*Zend*, t. I, I, LVIII-LIX) describes thus his stops in eastern India: 'When I slept in the towns, it was at the foot of some tree in the centre of the place, or in the gallery of a caravanserai, exposed to all winds, or at the entrance to some Moor or Indian house. The door to these houses is ordinarily preceded by a kind of lean-to formed by a sloping roof and supported by several pillars. It is there that the Indians take fresh air, smoke a hookah and converse, crouching upon two banks of elevated earth on either side of the door. My bed, beneath this sloping roof, was a large cow-hide spread out upon the ground; my

Buchanan at the time of his investigations in the provinces of Bihār and Baṅgāl,¹²⁸ which provide information regarding the lodging conditions of travellers in eastern India during the period of Mughal decline, will allow one to more clearly understand the prevailing conditions.

Regional Examples: Bihār and Baṅgāl

Along the country roads there were different institutions which came to the aid of travellers, such as the houses (*sadābrata* or *sadāvrata*)¹²⁹ maintained by Muslims or Hindus, which distributed each day gratis food to travellers. Wandering monks and mendicants generally found shelter in a temple or in certain buildings reserved for ascetics (*akhārā*);¹³⁰ they could also request hospitality of the local chiefs (*jeth ra'iyat*), who fed them at the expense of the village community. Finally, the shopkeepers (*modī*) sometimes took in travellers.

On the more heavily travelled routes, conversely, there were established at convenient distances *sarāe*, known by the name *bhaṭhiyār-khānah*, upheld by Muslims of an inferior extraction, whose wives refused nothing to assiduous clients. Each shelter consisted of several rooms which were rented for the night to one or several travellers. These were humble straw huts, 7 or 8 cubits in length and 5 or 6 cubits wide, generally containing no furniture, except for those dwellings reserved for travellers desiring to benefit from the favours of the hostess. There was a covered area where the animals could be tethered and vehicles parked. Hindus of higher caste only stopped at these places when they could not do otherwise; and, in any case, prepared the food outside. They paid one or two *paisā* for the night; the

rondache, beneath which I placed my arms and small baggage, served as my pillow, and I had always in hand one of the stakes to which were attached the ropes tethering my horse, fearing that during the night it might be stolen from me. When I arrived at the sleeping place before the fall of night, my people prepared their *kicheri* (mixture of lentils and rice, simply cooked in water, to which then a bit of butter and salt is added) and mine; if it was too late, a large glass of milk, flavoured with a morsel of brown sugar constituted my evening meal. I took then four or five hours rest, that is to say, from ten or eleven o'clock at night to three or four in the morning; always taking care to be the last to sleep, and the first to awaken. Without this precaution, I would have been exposed to theft, to being abandoned in the evening by my people, and in the morning, to setting out at too late an hour. This constraint is what most fatigued me during my journeys.

128. Even though these observations were made at the beginning of the British period (1807), they remain valid for the eighteenth century, as these institutions underwent but little change prior to the railway.

129. *Sadābrata* or *sadāvrata* (H.), daily distribution of food to travellers, the poor and to mendicants.

130. *Akhārā* (H.), assembly place, building in which live mendicant monks.

Muslims, who had a meal served to them, gave twice as much. Fire-wood was also available, as were tobacco, clay pots, shoes and hay for the horses.¹³¹

The regions of the eastern Gangetic Plain were diversely provided in this respect. In the districts of Bhāgalpur and Bihār, where the *sadābrata* were not numerous and where merchants but seldom took in travellers, there were sufficient *bhaṭhiyār-khānah* along the main roads; but no real security prevailed and, as a result of the frequent thefts, and the exactions of the police, of which the managers complained, several establishments had already been abandoned.¹³²

The other districts appear to have been less favoured. In Gorakhpur, only 34 *bhaṭhiyārā* families were registered and but few *sadābrata* and *sarāe* have been found. In Purniyā, travellers could reckon with the hospitality of the *modī* and wealthy individuals; and, in the south of the district, there existed several *bhaṭhiyār-khānah*. Travellers lodged in Dinājpur with those of the same caste, as there were no public shelters.¹³³

It will be noted that these establishments were light structures of thatch or palm and that the large caravanserais constructed of brick during the time of the Grand Mughals had fallen to ruin. In the Rājmaḥal *bādsāhī sarāe*, a portion having been destroyed, instead of vaulted rooms, huts had been raised to receive travellers;¹³⁴ the elegant *sarāe* in Dāūd-nagar, near the Son River, had been converted to a private building by the descendents of the founder, who could no longer decently live from the land revenues.¹³⁵ These two edifices were located on the Baṅgāl imperial highway. During this period, at the other extremity of the peninsula, in Tañcāvūr, the Maratha kings constructed their most beautiful *cattiram* on the Rāmēśvaram route. The development of these foundations in Tamil country reflected the religious vitality of South India; the decline of the rest-houses in the North corresponded to the waning of the political power and the inefficiency of the state.

131. Martin, *Eastern India*, vol. II, 288-90.

132. *Ibid.*, vol. II, 288-90; vol. I, 388-9.

133. *Ibid.*, vol. II, 449, 581, 1019; vol. III, 350.

134. *Ibid.*, vol. II, 290.

135. *Ibid.*, vol. I, 389.

5. Watering Places, Load Rests and Religious Monuments

Closely linked with the rest-houses are the watering places. In this hot country, where journeys were undertaken mainly during the dry season, travel was only feasible on those routes along which at regular intervals an abundance of water¹ was to be found, enabling the wayfarer to slake his thirst, refresh himself, bathe, cook and water the animals. For which reason, the Indian roads were punctuated with reservoirs and wells.

a. RESERVOIRS AND WELLS

Since time immemorial, the wealthy of the land and princes² have dug reservoirs and sunk wells along the roads. Should the ensemble of these works be represented on a map, it would be seen that they form a dotted line, quite slack in the arid region but becoming denser in the humid zone, running parallel to the lines of the road network.

Tanks

Practically everywhere in India, but especially in the Archaean zone of the peninsula, water was stored in vast reservoirs, *tālāb* (H.), *talāv* (Guj.), *kuḷam* (Tam.), which we designate with a term probably derived from the Portuguese: *tank*.³ There were in Hindusthān several which

1. The distribution of beverages on some roads was, as we have seen *supra* (161, 164), but temporary, and only princes or the wealthy had the means to have water conveyed by specialized bearers in water-skins or clay pots.

2. These works were considered to be of a charitable nature (vide, inter alia, Thévenot, *Travels*, 81). Since the time of Aśoka, according to the seventh pillar edict, the princes were interested therein. The emperor Jahāngīr wrote in his memoirs (*Tūzūk*, vol. II, 100) that he had wells dug at every three *kos* on the route from Āgrā to Lāhaur. Bernier (*Travels*, 284) mentions them in his description of the road linking Āgrā with Dehli and specifies that they provided drinking water to travellers as well as serving to water the trees along the famous avenue.

3. Vide *Hobson-Jobson*, 898-9. Inscriptions frequently make mention of these reservoirs. One of them, dating from the twelfth century (*Epigraphia Indica*, vol. XIV, 1917-18, 97-109) commemorates the construction of the Porumāmīlla tank (in the district of Kaḍapa) by king Bhāskara, son of Bukka I, stating that for the dyking of this body of water, 11 km by 4 km, every day for a period of two years 1,000 labourers were employed to dig and move the earth, and that 100 carts were utilised to transport the stones required to surface the structure.

were very well-known,⁴ either because of their size or the monuments (palaces, mausoleums) which were bathed in their waters; as for example, the *Hauz-i-Qutb* or *Kaṅkariyā tank* in Aḥmadābād, one of the largest in India and completed in 1451,⁵ or the *Gopī talāv* in Surat, mentioned by most of the seventeenth century European travellers.⁶ But, it was in the South, particularly in Tamil land, that these reservoirs were most directly associated with land travel. Almost everywhere the *kuḷam* are coincident with the rest-houses. Generally rectangular in shape, with steps of hewn stone on all sides, they were constructions as meticulously treated as the tanks of the large 'Dravidian' temples. Very beautiful tanks remain in the Kāñcipuram region, and are to be found on the Vantavāci route almost every 3 or 4 km in the proximity of the *cattiram* and *maṇṭapam*. The same is to be observed in the district of Tañcāvūr. These bodies of water, often celebrated in popular legends,⁷ were a familiar sight in the daily stages of journey, as elsewhere the wells, which were found mainly in the plains of the North.

Wells

The wells, of economic, social and religious importance in the villages, existed not only concomitantly to the rest-houses, but were also to be found along the roads. As is the case today, there were in the past different types: *kaccā* wells, mere holes dug in the alluvial soil where the water-level was near the surface, supported by a simple wattling; or, *pakkā* wells, more elaborately constructed in brick.⁸

In the arid zones of the North-West, such as in Rājputānā, they were generally located in low-lying areas and were of a profound depth. Many were sunk deeper than 100 metres, even 200 metres. Usually, the custodians of the wells undertook to draw the water using their own

4. Vide Crooke (*Things Indian*, 456-60, s.v. *tank*), who gives a summary description of the most important works.

5. Vide Thévenot, *Travels*, 11, 184; Burgess, *Muham. Arch. of Ahmadabad*, part I, 52-3, pl. LXV.

6. Vide in particular Thévenot, *Travels*, 294. This structure, already in ruin in the seventeenth century, no longer exists.

7. Cousens (*L.A.R.C.P.B.*, 6) recounts the legend of the Masūr tank (38 km north of Nāgpur) which, according to the local inhabitants, was reputed to have been dug by a goddess named *Hidimbā*. She was to have provided to all travellers who made there a halt, the requisite cooking utensils, under the obvious condition that they were to be returned after use. Alas, one day an unscrupulous wayfarer carried them off, provoking the anger of the goddess, who henceforth refused to come to the aid of travellers. This legend probably conserves the memory of an epoch when cooking vessels were at the disposition of travellers gratis. In any case, the relation between the tank and travel is significant.

8. Vide Crooke's excellent article in *Things Indian* (510-5, s.v. *wells*).

cattle, receiving from the passers-by a contribution for each bucket drawn.⁹

The roads in the Gangetic Plain were abundantly provided, and Modave observed in 1774, between Patnā and Faizābād 'an incredible profusion of wells which for the most part are cased with bricks, but almost all of them are just above ground, without any parapet; and, there being a good number of them alongside the road, it could be dangerous should one travel at night without a torch'.¹⁰ Unfortunately, it is scarcely possible to make a regional investigation of these structures; for, as the boring method has not changed over the years, in most cases they cannot be identified.

Bāvalī

In Western and Central India, on the other hand, particularly in Gujarāt, very elaborate *pakkā* wells are to be found bearing inscriptions which often enable them to be dated. They are called *bāvalī* (H.),¹¹ *vāvaḍī* and *vāv* (Guj.).¹²

These are brick-or stone-work constructions of rectangular, square or octagonal shape, provided with a pulled elevating device and consisting of corridors sunk into the earth down to the level of the water. These subterranean passages were frequently galleries, deployed at different levels and connected by stairways, where travelers could find coolness and tranquillity. Very richly ornamented, these works have no comparison elsewhere in the world, excepting perhaps the Italian Quattrocento; yet, one must recognize that the elegant Florentine wells, from an architectural point of view, are scarcely comparable to the *bāvalī*.¹³

In the Pañjāb, near Losar (8 km north-west of Takṣaśilā), there is located a brick-work *bāvalī* dating from the beginning of the seventeenth century, which has a depth of 30 metres and is surrounded by a platform with, on one side, a water trough for the animals.¹⁴

At Bayānā (80 km south-west of Āgrā), there is another (*Jhālur bāvalī*) which was constructed in 1318. Built of red stone, it forms a square with sides of 39 metres, having an entrance at each of the four corners into a vaulted chamber, provided with stairs leading to an open

9. *Ibid.*

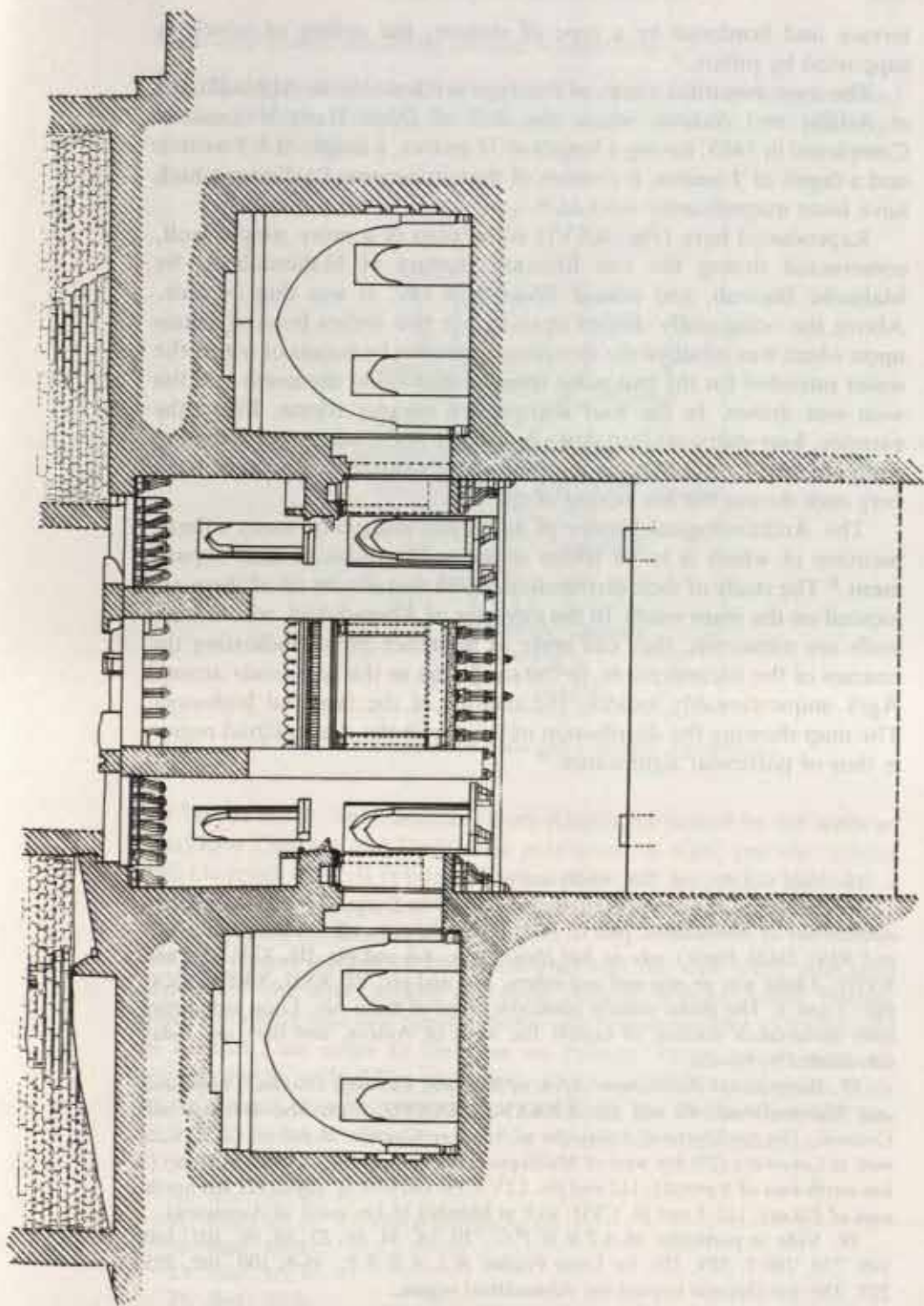
10. Modave, *Voyage*, 142.

11. *Bāvalī, bāvarī, bāvarī* (H.). Vide *Hobson-Jobson*, 108-9.

12. *Vāvaḍī, vāvarī, vāv* (Guj.). *Vāv* designates the more elaborate types of wells.

13. Fergusson, *Indian Architecture*, vol. II, 183. Percy Brown, *Indian Architecture (Islamic Period)*, 57-8.

14. Wheeler, *Five Thousand Years of Pakistan*, 94.



Scale of 10 0 10 20

XXVI. Vāv at Mahmudābād (Gujarāt): plan by Burgess (in *Mughal Architecture of Bharoch*, pl. LXXVII).

terrace and bordered by a type of cloister, the ceiling of which is supported by pillars.¹⁵

The most beautiful works of this type are found near Aḥmadābād, at Adāḷaj and Asārva, where the well of Dādā Ḥarīr is located. Completed in 1485, having a length of 37 metres, a height of 5.5 metres and a depth of 9 metres, it consists of three superposed galleries which have been magnificently worked.¹⁶

Reproduced here (Fig. XXVI) is the plan of a more simple well, constructed during the late fifteenth century at Maḥmūdābād by Maḥmūd Bīgarah, and named *Bhamariyā vāv*. It was dug in rock. Above the octagonally shaped opening are two arches bearing lintels upon which was installed the elevating apparatus by means of which the water intended for the two stone troughs situated to the north and the west was drawn. In the four corners are circular rooms. From the exterior, four stairways lead down to a lower floor, which, consisting of eight chambers positioned around the water's surface, must have been very cool during the hot period of the day.¹⁷

The Archaeological Survey of India has registered many others, mention of which is to be found in the publications of that department.¹⁸ The study of their distribution shows that almost all of them are located on the main roads. In the environs of Aḥmadābād, where stepwells are numerous, they can serve as reference points indicating the courses of the ancient roads, in the same way as the *kos-mīnār* around Āgrā unquestionably indicate the courses of the imperial highways. The map showing the distribution of the *vāv* in the Aḥmadābād region is thus of particular significance.¹⁹

15. Vide C.S.R., vol. XX, 69-70 and pl. XVI.

16. These structures have been studied in detail by Burgess: *The Muhammedan Architecture of Ahmadabad*, part II: *Mātā Bhavānī's step well*, 1-3 and pls. II, XIII and XIV; *Dādā Ḥarīr's vāv or Bāi Ḥarīr's vāv*, 4-6 and pls. III, XIV-XVI and XVIII; *Adāḷaj vāv or step well and others*, 10-3 and pls. VI, XXII, XXIII, XXX, figs. 3 and 4. The plates contain admirable plans of these *vāv*. Local authorities have undertaken nothing to exploit the wells of Asārva, and they are today surrounded by hovels.

17. Burgess, *On the Muham. Arch. of Bharoch, Cambay, Dholka, Champanir and Mahmudabad*, 46 and pls. LXXXV, LXXXVII. Vide also Burgess and Cousens, *The Architectural Antiquities of Northern Gujarat*, 94 and pl. LXXXIV, 2: well at Loṭeśvara (2½ km west of Muñjapur); 101 and pl. LXXX: well at Roho (7 km north-east of Varotrā); 112 and pls. CIV-CVI: old well at Vāyad (22 km north-east of Pātaṇ); 112-3 and pl. CVII: well at Māndvā (8 km south of Amalyārā).

18. Vide in particular *M.A.I.N.W.P.O.*, 10, 18, 34, 68, 83, 85, 90, 102, 140, 249, 278, 280-1, 320, 329, for Uttar Pradesh; *R.L.A.R.B.P.*, 95-6, 100, 102, 225, 227, 230, for Gujarāt beyond the Aḥmadābād region.

19. We utilize here the inventory made by *R.L.A.R.B.P.*, 81-5, 93-102.

Wells and Roads Radiating around Aḥmadābād

The road from Kaṭhiyāvād, in south-westerly direction, was punctuated by the Śekhpur Kānpur, Palḍī Kocrab and Vāsnā vāv, and the large reservoir at Sarkhej.²⁰



XXVII. Distribution of wells (vāv) around Aḥmadābād.

To the north, the main road from Rājputānā passed by the wells at Daryāpur Qāzīpur and Vadaḷ, the post-house at Kālī, and the Adāḷaj and Ovarsad vāv.²¹ It is probable that one could have also followed a parallel road, somewhat to the east, by way of Acer, Budṭhal and Por, where wells were also located.²²

The routes leading to the north-east and the east were also well provided. The first, setting out from Asārva, served Aspūr Surpur before dividing into two ramifications; one branch leading to Valād and to Parāntij, the other to Dehgām via Enāsar, stages which were all provided with wells.²³ The second went by way of Rākhya (which, with its six vāvādī, was probably a road junction), the Odhav tank and the well at Kubadthāl.²⁴ The third led to Vastral via Maḥmūdābād.²⁵

20. *Ibid.*, 85, 83, 81.

21. *Ibid.*, 85, 81, 83; *Mir'āt* (Supplement), 172.

22. *Ibid.*, 82-3.

23. *Ibid.*, 85, 82, 83.

24. *Ibid.*, 82-3.

25. *Ibid.*, 83.

There were also several *vāv* at regular intervals on the Surat highway, at Rājpur Hirpur, Goḍāsar, Ropḍā, Devḍī and Bārejḍī,²⁶ as well as on the Khambhāt route at Behrāmpur, Dānī Limḍa, Narol, Aslālī and Jetalpur.²⁷

This regional example demonstrates very clearly the significance of wells, not only in urban and village life, but also as regards land communication. In the arid or semi-arid regions of western India, the halting places were near water points (this is explicitly stated in some inscriptions),²⁸ and the activities taking place there must have been very similar to those which one now witnesses around the large wells at the pilgrimage places, where an entire heterogeneous world of travellers, pilgrims, merchants and mendicants congregates, bustling about, bathing, preparing meals, or praying.

b. LOAD RESTS

The innumerable load rests must also be noted, which were to be found along the ancient routes throughout most of India.

Jahāṅgīr observed in his memoirs,²⁹ that the people of Gujarāt raised, with charitable intention, low walls along the roads, so that wearied porters could deposit their load, and after having rested, retrieve it without requiring assistance. Thévenot³⁰ states that they were found near to all rest-houses. Rudolph and the fathers of the first mission to the Grand Mughal court encountered them almost everywhere after having traversed the Tāptī along the road leading to the capital.³¹ Davidson³² remarked, around 1840, that the old pilgrimage

26. *Ibid.*, 83-4. Farther into the Khedā (Kairā) district there were *vāv* in Mahmūdābād, Varod and Vāsād (*ibid.*, 93, 95).

27. *Ibid.*, 84-5, 83, 82. In the Khedā (Kairā) district there are those at Sojitrā and at Khambhāt (*ibid.*, 225, 96).

28. The inscription found on one of the wells at Dādā Harīr mentions that it is both a splendid rest-house for travellers and a body of water to assuage the thirst of man and animal (*Bombay Gazetteer*, vol. IV, *Ahmadabad*, 282). On the gate of the Bayānā well (*Jhālar bāvalī*), it is specified that Kāfur Sultān developed this facility with drinking water alongside the road (*C.S.R.*, vol. XX, 70).

29. *Tūzuk*, vol. I, 420.

30. Thévenot, *Travels*, 81.

31. G. Goldie, *The First Christian Mission to the Court of the Great Mogul* (1897), 60.

32. Davidson, *Diary*, vol. I, 79. It must be added, that among the megalithic monuments of the Khāsī Hills, stone slabs have been found along the trails or at market places, arranged horizontally on vertical supports (similar to our dolmens) upon which travellers might have placed their burdens. In this region, where human portage ensured the essential transport, these load-rests, called *maw-shongthait*, were particularly appreciated by travellers. H. Yule ('Notes on the Khasia Hills', *J.A.S.B.*, vol. II, 1844, 618) measured one that bore a stone slab of 9.6 metres length, 4.5 metres width and 0.6 metres thickness, supported by stones

route following the Gaṅgā in the direction of Haridvār was bordered by a parapet 5 feet high with 'ornamented platforms' at regular intervals upon which brahmins could seat themselves. Gore,³³ at the close of the previous century, noted structures of this type on the Himālayan border at Maṇḍi. We have encountered these platforms in Nepāl,³⁴ in the Gangetic Plain, as well as in the desert of Rājputānā, where they are utilized by cameleers to load and unload their animals. But, we have not made such systematic observations regarding this subject as was possible in the South of the peninsula, which after a residence of several years is better known to us.³⁵

*Platforms to Rest Burdens and Cisterns in the South of the Peninsula*³⁶

Throughout Tamil country, as well as in Kēraḷa and Kaṇṇāṭaka, one finds at intervals along the main roads long slabs of stone (granite or granulite) posed upon two upright stones. They have the height of an average man, in a manner so as to permit travellers to unload and retrieve without great difficulty the loads which they ordinarily carry on their heads (vide Fig. XXVIII, a., c., d.)³⁷. They are called *cumaitāṅki* in Tamil,³⁸ *cumaṭutāṇṇi* or *attāṇi* in Malayāḷam and *ettugallu* in Kaṇṇaḍa. Sometimes these slabs are accompanied by bench of the same construction, having a height of approximately 50 centimetres, upon which one might stretch out at full-length to rest (vide Fig. XXVIII, c., e.).³⁹ More rare are benches or platforms in masonry. Buchanan⁴⁰ noted one on the road from Madrās to Kāñci; we have found two near a *cattiram* ruin at MelakaruṅkuLi (6 km north of Maturāntakam) and

1.50 metres high. Vide also P.R.T. Gurdon's observations in *The Khasis*, 150-3.

33. Gore, *Lights*, 112-3.

34. In Nepāl, sometimes beneath a tree, often at the junction of tracks, one encountered platforms made of earth or of brick, where travellers could sit or pose their loads; they are called *cautāro*.

35. Prof. P. Saran was very much interested in this question and thought that the inventory of these works would shed light on the courses and organization of ancient roads. We had envisioned to undertake together an investigation in the plains of the Gaṅgā when he retired; but alas, the project could not be realised.

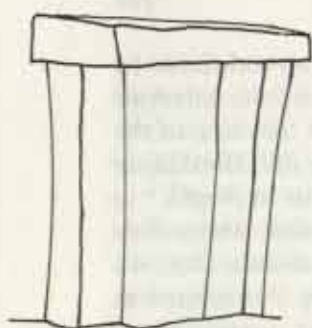
36. We wish here to thank our friend, Emmanuel Adicéam, who was kind enough to share with us his knowledge of Tamil country and provide valuable indications which greatly facilitated our research.

37. Anquetil Duperron (*Zend*, t. I, I, XXXI), speaking of the *cattiram* in the region of Ceñci (Jiñji), specifies: 'To one side, outside, is a type of support to relieve those who bear loads'.

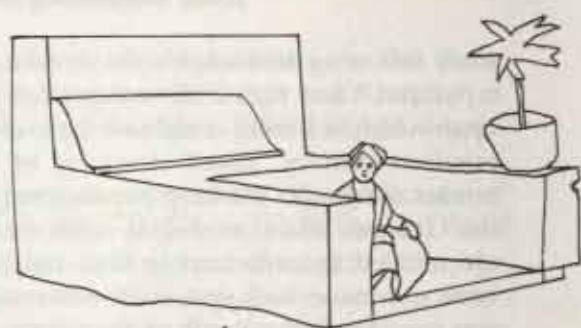
38. *Cumai*, load, burden, *tāṅki*, support.

39. They are particularly numerous all along the road from Tiruvaṇṇāmalai to Kīrṣṇakiri (Kṛṣṇagiri).

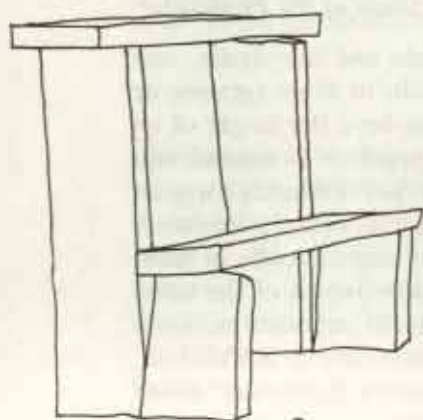
40. 'A wall about 4 feet high' (Buchanan, *Journey*, vol. I, 1-2).



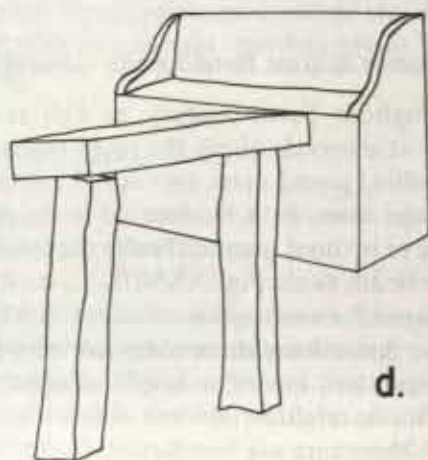
a.



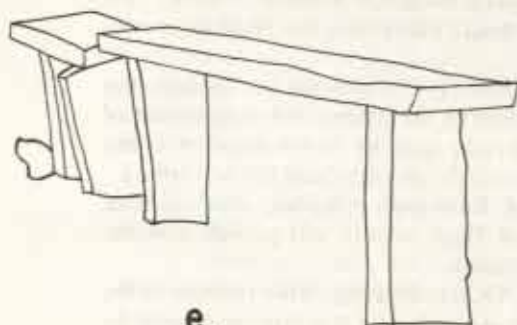
b.



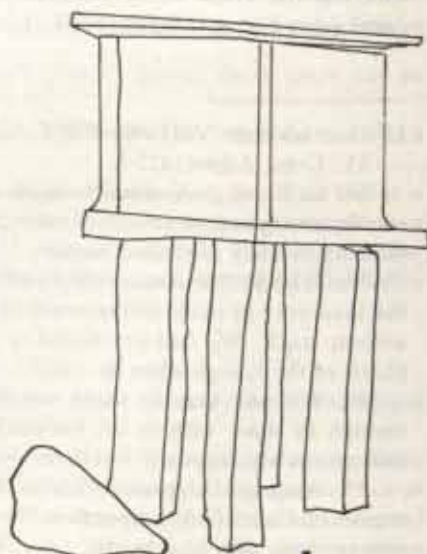
c.



d.



e.



f.

XXVIII. Load rests and cisterns in the South of the Peninsula: a., c., d., e., *cumaī-tānki* of granite in Tamil country; b., d., masonry benches of the same region; f., *taṇṇīrttoṭṭi* (cistern) from the eastern border of Kārṇāṭaka (based upon recent photographs).

several others on the road from Kāñci to Vantavāci (vide Fig. XXVIII, b. and d.). In the Ponnāni region of Kēraḷa, the *attāni* are usually made of blocks of laterite.

On the eastern border of the Maisūru plateau, one frequently encounters a type of water reservoir, *taṇṇirttoṭṭi* (Tam.), *jalandhara* (Kan.), formed of granite slabs with cemented joints and supported by four pillars, the base of which is at a man's height. To reach it, a stone bench or a step is usually provided (vide Fig. XXVIII, f.).⁴¹ Sometimes there is along the road an entire ensemble of installations intended for travellers, comprising a load rest, a bench, a water tank and a shelter.⁴²

To whom are these facilities to be attributed? Evidently to philanthropists of the past, princes and wealthy merchants. Also to more humble individuals, for it remains still a custom in Tamilnāḍu at the occasion of the death of a pregnant woman to erect a *cumaitānki*, that she free herself of her load (the infant dead before birth), and that thus her spirit might be at peace.⁴³ At this point, one broaches the spiritual domain, the beliefs which also have a significance for the life of the road.

c. RELIGIOUS MONUMENTS

The innumerable cult precincts bordering the roads availed to the satisfaction of the wayfarers' spiritual needs. To begin with, the road stations at which the travellers halted each evening were foreseen with shrines: mosques in the imperial *sarāe*, temples in the Hindu rest-houses. Also, from one village to the other, there were notable monuments of very different types: small temples, shrines, niches, etc. sheltering the gods who corresponded to the diverse local cults; they still abound throughout the Indian countryside. Inhabitants of the surrounding villages were drawn to them, and travellers and pilgrims did not fail to offer their devotions at these precincts. Sources of

41. Vide our recent article, Bornes milliaires de l'Āndhra Pradesh, réservoirs à eau du Karṇāṭaka et monuments religieux du Sud liés à la route, *B.E.F.E.O.*, t. LXXV, 1986, 42-46, pls. IV-VII with a map. These *taṇṇirttoṭṭi* or *jalandhara* are numerous in the district of Kōlāra, in the eastern part of the district of Beṅgalūru in Karṇāṭaka, and in the tāluk of Hosūru, in Tamilnāḍu.

42. *Ibid.*, 43 and pl. VI. We have seen these facilities near Cikkaballāpura and Ānekallu in Karṇāṭaka.

43. Vide Lakshmanan Chettiar, *Folklore of Tamil Nadu*, 89. The explications as given by the local inhabitants vary slightly in detail, but generally confirm that this charitable act had a propitiatory value. The grandmother of a brahmin family in Madraś recounted to us the following story: Her sister had given birth to ten children, all of whom had died at an early age. She thus requested that a *cumaitānki* be erected, in the hope that this pious work would result in better fortune, or rather, would liberate her from her burden (the fatality). This was done, and she later gave birth to other children, who survived.

spiritual succour, they also served as landmarks and represented veritable religious milestones. Unfortunately, because of the dearth of regional studies, one does not perceive in most cases the true relationship in which they could have stood with land travel. The only information which we have on this subject concerns the South of the peninsula, where the elephant-headed god, Gaṇeśa, also called *Pillaiyār*, 'the son' seems to have played a prominent role in man's faring from one place to another.

Pillaiyār and the South Indian Route

Indeed, wayfarers regularly mention his presence at the journey stages. De la Flotte⁴⁴ noted that 'near the tanks one sees almost always a small shrine in which reposes the stone figure of the god *Pillaiyār*'. Bartolomeo⁴⁵ states that there was also a stone image of Gaṇeśa in the main room of the rest-houses, and that on the main roads, in place of milestones, one found everywhere statues of this god to guide strangers.⁴⁶

We have been able to verify in the Tamil country that the important *cattiram* are usually accompanied by a temple dedicated to Gaṇeśa, which is situated near to the *kuḷam*,⁴⁷ that the *maṇṭapam* are provided with niches which in earlier times must have contained his statue.⁴⁸ As concerns the stone-blocks sculpted in his image, they probably had to withdraw when the English enlarged the roads, for today they are seldom to be seen.

All of which would signify that the worship of Gaṇeśa, the Lord of obstacles (*Vighneśvara*), who is invoked at the outset of all undertakings, was very much alive in the South and had a particular significance for travellers. If one gives credence to N. Subrahmanian,⁴⁹ this privileged role of the elephant-headed god would have been resultant of the fact that, at least in Tamil country, he would in the past have

44. De la Flotte, *Essais*, 220.

45. Bartolomeo, *Voyage*, 69-70.

46. *Ibid.*, 'As the Greeks and the Romans turned to the god Terminus to this end, the Indians use their divinity *Gaṇeśa*, whom the common people name *Pillaiyār*'.

47. As, for example, at Ammācattiram, very near Kumpakōṇam, and at Periya Mutaliyar Cāvaṭi, north of Pondicherry.

48. Today they are commonly vacant, but at Perunakar (18 km north of Vantavāci) the statue of Gaṇeśa is still in the niche of the *maṇṭapam* on the roadside.

49. N. Subrahmanian, *Sangam Polity*, 360-1.

taken the place of an old local patron-divinity of the road.⁵⁰

Given the present state of knowledge, one can scarcely proceed further in this analysis. Let us retain the fact, that the Indian routes were lined with establishments of all types, which responded to the physical and moral needs of the wayfarer, and that they thus pertain to the social (or rather, socio-cultural) history of India.

50. If Ganeśa images are today seen on many roads in Tamilnāḍu, Hanumān is usually represented on stone slabs along the highways in Karnāṭaka and Āndhra Pradesh (vide our article mentioned *supra*, n. 41, B.E.F.E.O., t. LXXV, 1986, 46 and pls. VII and VIII).

6. Diversity of Roads

All roadways, however, were far from having received the same attention. The ordinary roads, humble works and anonymous, the result of generations of peasant labour, were relinquished to the reign of the seasons or the attention of private individuals. The main roads, on the other hand, which were directly instrumental in the affairs of state, were developed and maintained; it is these which were bordered with trees or milestones, or benefited from that admirable system of rest-houses and watering places. In the Mughal sphere of influence, the large strategic and commercial axes, the Grand Trunk Road from Kābul to Baṅgāl, the route to the Gulf of Khambhāt, were objects of the great Timurid sovereigns' concern. In the opinion of travellers,¹ the results of this vigorous road policy were by no means negligible. The best provided route was that between Āgrā and Lāhaur (827 km), then that from Āgrā to Ajmer (368 km), followed to a lesser degree by that from Āgrā to Ilāhābād (473 km) and a portion of the road from Āgrā to Burhānpur). Should a circle be drawn passing through Lāhaur, Ajmer and Ilāhābād, whose centre was a point between Dehlī and Āgrā, it would have a radius of some 480 km, which would seem to represent the range of real state activity in the matter of road networks, covering an area which could be considered as the heart of the Mughal empire.

Our documentation regarding the Deccan is too scant to allow of a meaningful evaluation, except locally, of the role assumed by the various governments. Nonetheless, it is known that the great transversal route from Surat to Macilīpaṭṭaṇamu, as well as the North-South axis leading to Rāmeśvaram by way of the Coromandel plains, were both remarkably well organized.

Perhaps in the future, scholars will relate the history of the regional routes and describe their organisation in detail.² In the meantime, it can be said that despite the imperfection of the roadways, a system of regular communications existed from one end of the country to the other, which permitted the movement of men and transport of goods.

1. We take into consideration here the tree-lined avenues, *kos-mīnār* and rest-houses, which have been discussed separately *supra*.

2. For example, the examination of the old route from Kāñci to Rāmeśvaram would provide numerous new elements. It is possible to undertake similar investigations elsewhere. We think in particular of the ancient pilgrimage route leading from Ratnāgiri to Paṇḍharpur in Mahārāṣṭra which is punctuated with *dharmaśālā* (Vide *Bombay Gazetteer*, vol. XIX, *Satara*, 194).

Assessments

Historians of the nineteenth century under-evaluated the road system of the Indian sovereigns, so as to justify British occupation. Elliot, in the introduction to his *History of India*,³ characterizes the Muslim chronicles as panegyrics in bad taste, and affirms that prior to the arrival of the English, there were no roads. He neglected to note that, until the mid-nineteenth century, British administration undertook practically nothing to maintain and improve the roads and allowed of the deterioration of the old network. Lucid observers did not commit comparable mistakes. Valentia⁴ noted in 1803 that the British government, interested only in extracting money from the population, might well have taken inspiration from the magnificent road achievements ensuing of the House of Tamerlane, and that the few *bungalows* constructed by generous governors could not support comparison with the tremendous *bādsāhī sarāe* erected by the emperors on the Grand Trunk Road. Spry, in *Modern India*, published in 1837,⁵ also stressed the negligence of the British authorities and regretted that the Mughal works (bridges, wells, caravanserais, etc.) were in ruin. Finally, Capper, in *The Three Presidencies of India* (1853),⁶ drawing a parallel between the seventeenth century Europe and India, did not hesitate to remark that the travelling conditions at that time were better in the Mughal empire.

It is not a question of minimizing the achievements of the British administration during the second half of the nineteenth century; however, it must indeed be admitted, that until the *Mutiny*, that administration was but little concerned with the problem of communications, excepting along few major axes. A century of anarchy wrought disastrous consequences regarding the communication routes: many rest-houses, wells, had been abandoned; the tree-lined avenues of the Gangetic Plain decimated; and the course of roads in those areas where they had been left to the forces of nature, obliterated. Tod has given an example of the state of ruin in the Mount Ābū region, where the Mughal main road from Āgrā to Aḥmadābād had passed. On 16 June 1822, at Sarotrā, he noted that the route traversed a deep forest, barely

3. *History of India*, vol. I, XXIII-XXVII.

4. Valentia, *Voyages*, vol. I, 81.

5. Volume II, 11-12.

6. J. Capper, *The Three Presidencies*, 354-5: 'Each of these barbarous sovereigns expended as much money in works of public utility as would have supported any of the standing armies of Europe in those days.... Their public spirit would be well imitated by the present rulers of the Indian Empire who, with the narrow views which prompt them to look no further than "to-day"... dare not to venture to copy the liberality of their Tartar teachers, and give back to their subjects some portion of the fees in useful roads and wells'.

accessible to those on foot and to pack animals, and that it had been necessary to dispatch men to clear the way with axes.⁷ This highway, which in the seventeenth century had linked the great centres in the North to the ports on the Gulf of Khambhāt and which had witnessed the passage of so many caravans, was thus overgrown by jungle.

Based upon this miserable condition of the roads, one hastily and unjustly deduced that Mughal India had never known anything else, without having the probity to consider the judgements of contemporaneous observers, in particular of travellers, who testify to the remarkable organization of the roadways as well as to the variety in the means of transport.

7. *Travels in Western India*, 135-6: 'No better proof can be given of the abandoned condition of this country, once the highway of commerce between the sea ports and Northern India, than this relapse of civilisation into a state of nature. Here with all the wonders of Aboo, Taringi and Chandravati around us, the one fallen, the other fast sinking into decay, we can speculate upon the Hindu doctrine of the destruction of worlds, and the passion of their lordly inhabitants. These roads once crowded with caravans of commerce and of pilgrims, or resounding to the tramp of the war-horse, were now little trodden, save by the foot of the savage Koli, who finds shelter amidst his own indigenous woods and rocks'.

III

MODES OF TRANSPORT

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III

THE EVOLUTION OF THE HUMAN BRAIN
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MODELS OF TRANSPORT

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The land routes thus corresponded to the techniques of travel and transport based exclusively upon the use of the muscular force of man and animal,¹ as utilized in three principal forms: *human portage*, *transport by pack animal* and *cartage*.

1. The force of the animal motor is relatively weak: it functions in a discontinuous manner in relation to the mechanism of the reconstitution of alimentary reserves, which makes periods of rest necessary and thus limits the duration and intensity of its effort. Its efficiency, dependent upon several factors (environment, weight, age, alimentation, resistance, etc.), cannot be determined by precise numerical evaluation. However, remarkably supple, the animal motor can adapt itself to varied transport conditions; and, it is for this reason that it is still today largely implemented in the Indian countryside, where it often successfully competes with the steam engine and the internal combustion engine (vide Sorre, *Fondements de la Géographie humaine*, t. II, 1^{re} partie, 217-9).

The first of the two main points of the report is that the
present system of taxation is not only unfair but also
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the many who are unable to pay it are left to their fate.

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It is inefficient because it does not produce the maximum
amount of revenue for the Government. The report
suggests that the system should be reformed so that
it is fair and efficient. It suggests that the burden
should be placed on the shoulders of those who are able
to pay it, and that the system should be reformed so
that it produces the maximum amount of revenue for
the Government.

1. Human Porterage

Human porterage, which has diminished along the Himālayan tracks, and on the Indian peninsula is now confined to short-distance transport in proximity of the railway stations or pilgrimage centres, played in the past a much more prominent role. It occupied an entire legion of bearers whose métier was regulated by secular traditions which determined such things as the manner in which the load was carried, the capacity, as well as the professional organization of the various local or regional groups.

Ways to Carry the Loads: Individual Porterage

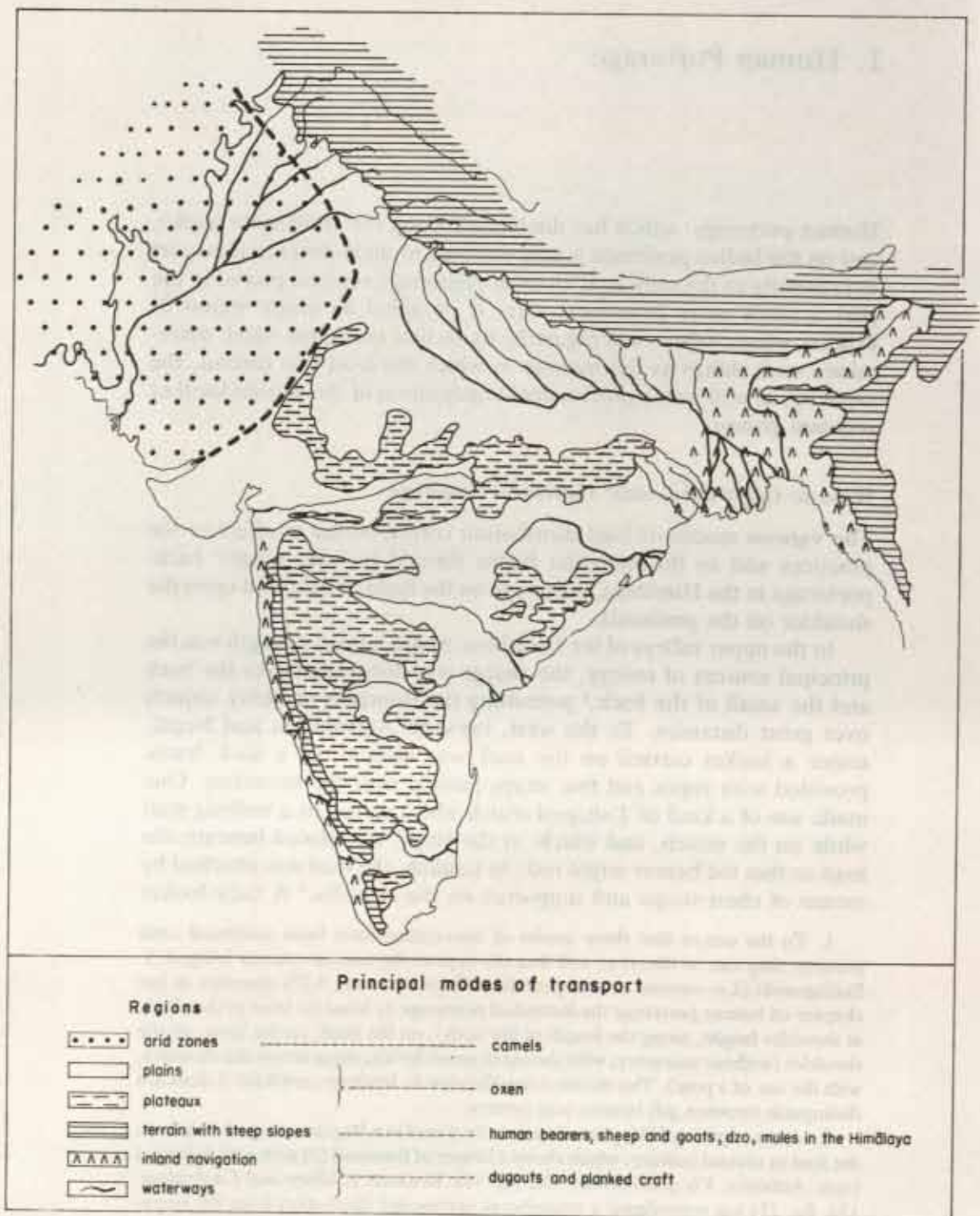
The various modes of load distribution corresponded in effect to the practices and to the muscular habits formed by long usage:¹ back-porterage in the Himālaya, porterage on the head or balanced upon the shoulder on the peninsula.

In the upper valleys of the Himālaya, where human strength was the principal sources of energy, the charge was distributed over the back and the small of the back,² permitting the transport of heavy objects over great distances. To the west, between Afghānistān and Nepāl, either a basket carried on the back was utilized, or a stick frame provided with ropes and two straps passing over the shoulders. One made use of a kind of T-shaped crutch which served as a walking staff while on the march, and which, at the stops, was placed beneath the load so that the bearer might rest. In Ladākh, the load was attached by means of chest-straps and supported on the clavicles.³ A back-basket

1. To the extent that these modes of conveyance have been continued until present, they can be observed and thus the gaps in the ancient sources bridged. I. Szelagowski (*Les moyens de transport dans l'Inde ancienne*, 5-27) describes in her chapter on human porterage the individual porterage by hand (in front of the chest, at shoulder height, along the length of the body), on the head, on the back, on the shoulder (without accessory, with the aid of some device, slung across the shoulder, with the use of a pole). This detailed classification is, however, artificial: it does not distinguish between gift bearers and porters.

2. A description of this procedure is to be found in a Begrām ivory, dating from the first or second century, which shows a bearer of firewood (?) with a back-basket (vide Auboyer, *Vie quotidienne*, 132, fig. 11). Kosambi (*Culture and Civilisation*, 133, fig. 21) has reproduced a magnificent manuscript illustration from the beginning of the seventeenth century portraying Kāśmīrī bearers.

3. Vide, concerning Kāśmīr, Forster, *Journey*, vol. 1, 248; Drew, *Northern Barrier*, 93; Biscoe, *Kashmir*, 33; Lawrence, *Kashmir*, photo f.p. 183; concerning



XXIX. Extent of human portage and transport by pack animals in India (our documentation regarding wheeled vehicles is too summary to be able to demarcate its domain with precision).

was employed in the eastern region (Nepāl, Sikkim and the Assamese mountains), or a bamboo support attached to the head by means of a frontal band⁴. In other words, in the Western Himālaya the load was mainly supported by the muscles of the waist and lower back; while to the east of the mountain chain, primarily the muscles of the head and neck were utilized.

These practices were unknown in the plains. Generally, objects were borne in one of two manners: either by placing them on the head, which was protected by a straw ring or by means of a rolled length of cloth,⁵ or by carrying them in two baskets suspended on either extremity of a pole borne on the shoulders,⁶ equivalent to a shoulder yoke, and called *bahaṅgī* in the North, *kāvaḍī*⁷ in the South. The implementation of these methods varied from region to region and among social groups, as well as according to diverse factors which frequently elude our knowledge.

The employment of the shoulder yoke would appear to have been more common in Hindusthān than in the Deccan (at least in Tamil country),⁸ although there was no local uniformity. Hence, in the region of the lower Godāvārī, upstream from the delta in the area of Bhadrācalamu, where cartage was not practised, the conveyance of goods was

Garhvāl, *N.W.P.G.*, vol. X, 252; concerning the Satlaj valley, Lloyd, *Narrative*, vol. I, 253. In the upper valleys of the Kumāyūm, the Bhoṭiyā make use of a back-basket held by straps and when the load is very heavy also use a frontal band which holds the straps in position (good description in Pant, *Social Economy*, 205 and photo of a bearer, f.p. 240).

4. Vide Kirkpatrick, *Account of the Kingdom of Nepaul*, 38-40, particularly the prints f.p. 39: the Dhoka (*ḍoko*, or back-basket) and Hammock, and f.p. 40: Natives of Nepaul (Hill-porters); Buchanan (F. Hamilton), *Account of the Kingdom of Nepal*, 233; R. Upadhyaya, Himalayan haul, photo Essay, *Frontline*, Nov. 24-Dec. 7, 1990, 62-71, 12 photographs; *J.R.G.S.L.*, vol. II, 'Account of the Cossiah Country', 94; Crooke, *Things Indian*, 109.

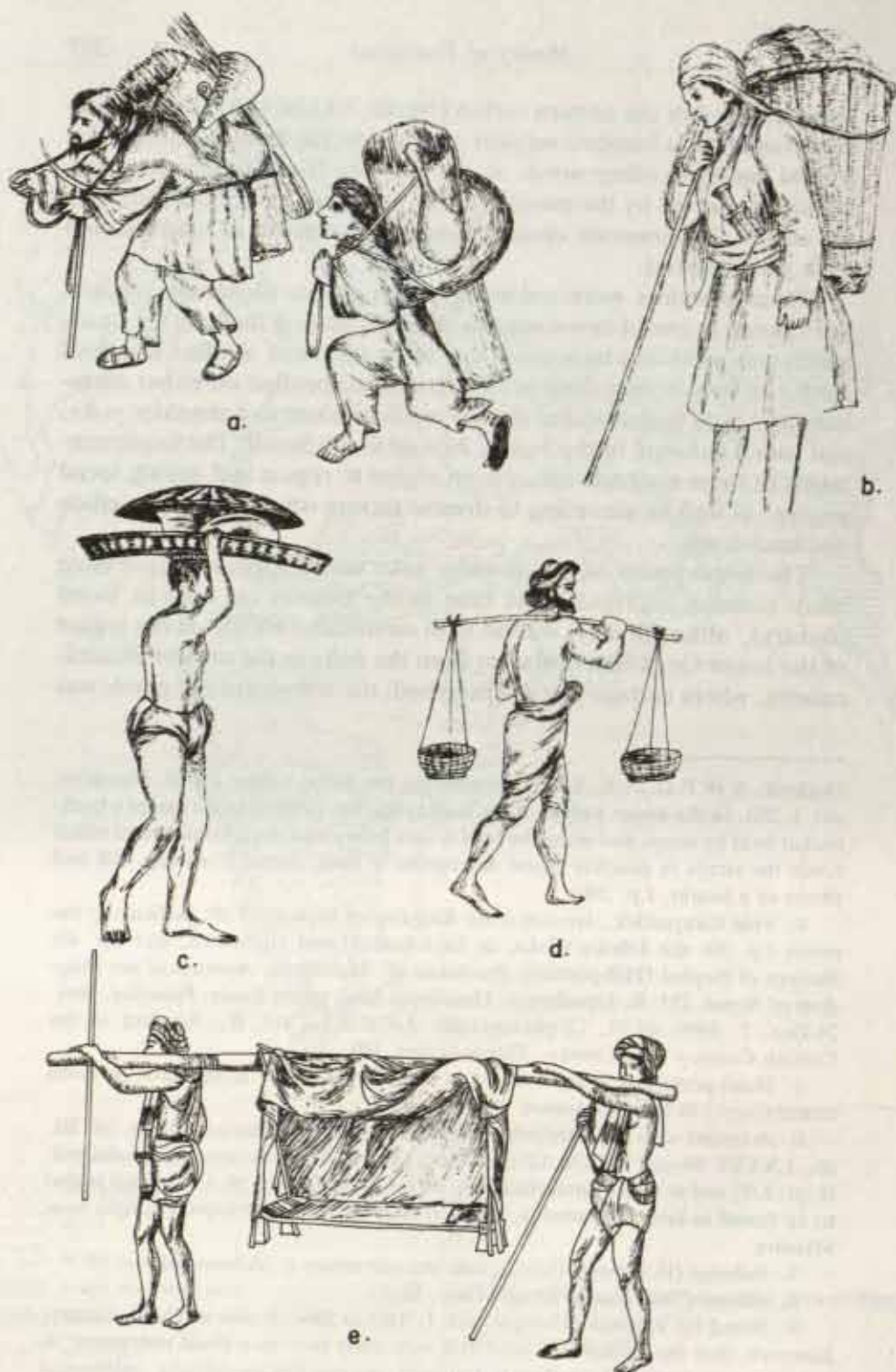
5. Head-porterage is represented in a bas-relief in the Kṛṣṇa cave (seventh century A.D.) in Māmallapuram.

6. A bearer with shoulder yoke is depicted at Bhārhut (Barua, *Barhut*, bk. III, pls. LXXVI, 99 and LXXX, 111), at Sāñcī (Marshall, *Monuments of Sanchi*, vol. II, pl. LII) and at Golī (Ramachandran, *Buddhist Sculptures*, pl. I, C). Such is also to be found in later monuments, for example at the Sōmanāthapura temple near Maisūru.

7. *Bahaṅgī* (H.), *baṅgī* (Mar.); vide the references in *Hobson-Jobson*, 60.

8. *Kāvaḍī* (Tel., Kan.), *kāvaṭi* (Tam., Mal.).

9. Noted by Valentia (*Voyages*, vol. I, 348) in 1804. It was in Tamil country, however, that the *kāvaḍī* was used at a very early time as a ritual instrument in religious ceremonies. According to tradition, the two Paḷaṇi hillocks, celebrated place of pilgrimage in the Maturai district, were reputed to have been borne there by a disciple of the sage *Agastya* in two baskets suspended from a pole. Also the devout who today pilger to the shrine bear their offerings in a *kavaḍi*. This form of



XXX. Human portage, based upon ancient illustrations: a., Kašmīri porters (miniature from the beginning of the 17th century, reprod. in Kosambi, *Culture and Civilisation*, fig. 21); b., Nepalese porters (drawing by Kirkpatrick (1793), *Account*, f. p. 40); c., Bengali porter (print by Solvyns, *Les Hindous*, t. III, s. v. ferry); d., Sikh porter (drawing by Mundy, *Pen*, vol. I, p. 132); e., litter borne by two men (print by Solvyns, *Les Hindous*, t. III, s. v. d'hoully).

effectuated solely by means of *kāvaḍi*.¹⁰ Geographic factors were apparently not determinant in this domain; thus, in the foothills separating the Pañjāb and Kaśmīr, loads were carried on the head, whereas eastwards in the Kāthmāṇḍū basin, the Nevar utilized the *bahaṅgi*.¹¹

Human factors played a greater role. In Bihār's Purīyā district, Buchanan¹² noted at the beginning of the nineteenth century that there were two types of bearers: the *Moṭiyā*, who transported loads on the head, and the *Bharyā*, who employed the pole. He added, that no one could introduce innovations into his profession, under penalty of automatic exclusion from his caste. Just as the *Beldār* of Baṅgāl always carried earth in baskets on their heads, while the *Korā* utilized exclusively the shoulder yoke. On the Nikobar Islands, the method of conveyance was based upon sex distinction: the women placed the objects on the head, whereas the men used pole.¹³

The different modes of load distribution in India were thus closely linked to the traditions of the bearers and were resultant of a particular economic and social complex¹⁴ (vide Fig. XXX, a., b., c., d.).

Group Portage: Heavy Loads

Conveyance by means of litter was widespread. Two types of vehicles were used: the one-pole litter or *palanquin*,¹⁵ consisting of a bodywork suspended from a straight or lightly curved bamboo, the richness of decoration or degree of comfort corresponding to the social rank of the

adoration originating in PaLaṇi was subsequently adopted by other MurukāN temples (vide Somasundaram, *Palni*, 4).

10. *Gazetteer of the Central Provinces* (ed. Grant), 508.

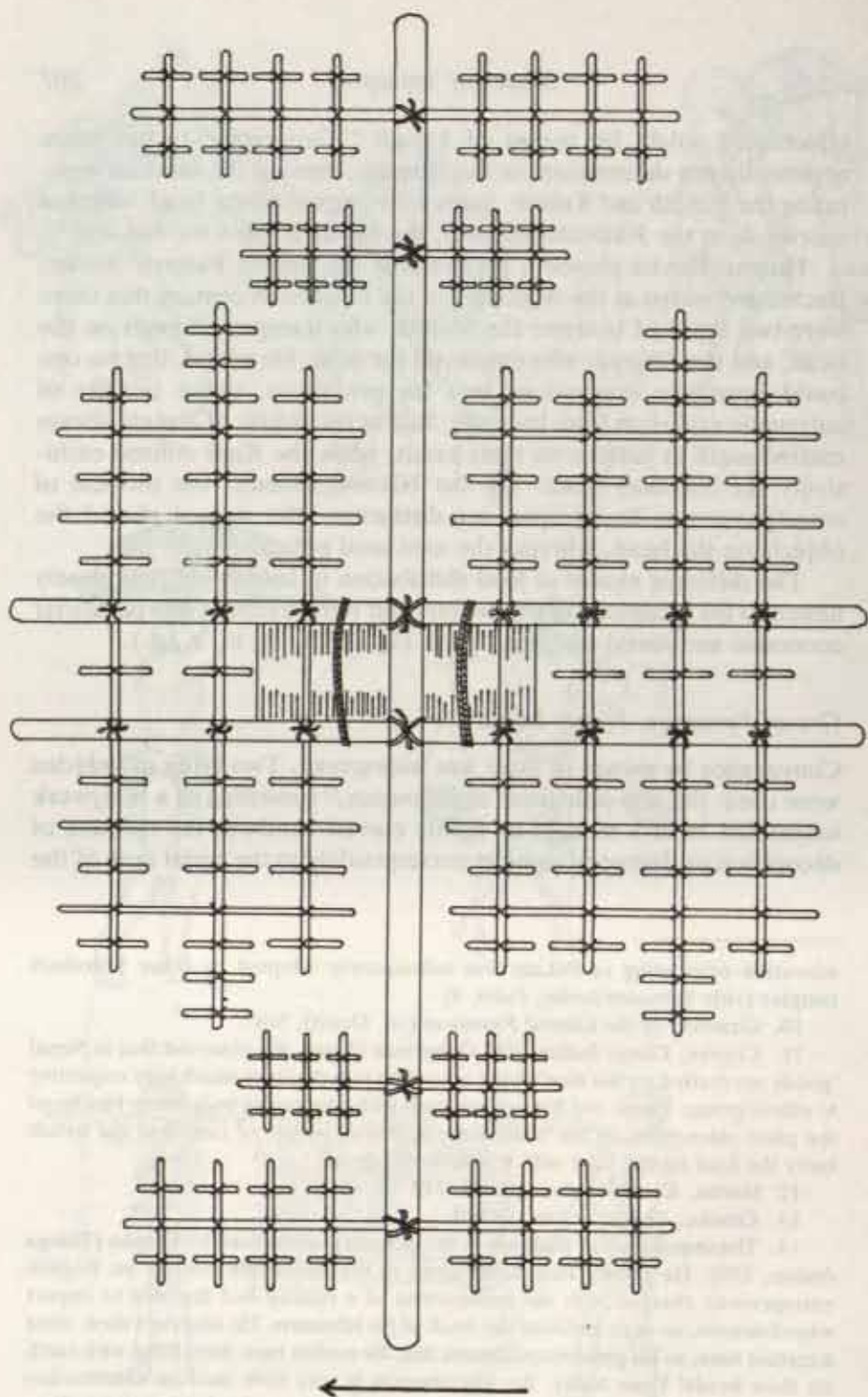
11. Crooke, *Things Indian*, 109. Gaboricau (*Népal*, 89) observed that in Nepāl 'goods are carried on the man's back according to techniques which vary respective to ethnic group: *Tharu* and *Nevar* bear loads with a balancing pole; some Hindus of the plain place them on the head; the majority of people of caste and the tribals carry the load on the back with a strap in the front'.

12. Martin, *Eastern India*, vol. III, 349.

13. Crooke, *Things Indian*, 109-10.

14. The importance of tradition in this domain is underlined by Crooke (*Things Indian*, 109). He relates that at the close of the nineteenth century an English entrepreneur charged with the construction of a railway had the idea to import wheelbarrows, so as to facilitate the work of his labourers. He observed then, after a certain time, to his great astonishment that the coolies bore them filled with earth on their heads! Even today, the wheelbarrow is very little used on construction sites, and the labourers continue as in the past to carry the loads on their heads or with a pole.

15. *Paryanka* (Skt.), couch, sofa; *palaki* (Kan.), *pālki* (H.). The description of the different palanquins and litters as used in India is given in our book, *Contribution à l'histoire de la voiture en Inde*, 91-103, Figs. XXVII-XXX.



XXXI. Frame used for moving large masses of stone in Upper India (from *Selections from the Records of Government, North-Western Provinces*, vol. V, 1869, f. p. 316, and Ball, *Manual of the Geology of India*, part III, pl. VIII, f. p. 544).

travellers;¹⁶ and, the two-pole litter, made of a framework stretched between two parallel bars, often covered and curtained, almost exclusively reserved for the travel of sovereigns, the women of the *haram* or the processions of the heavy temple statues.¹⁷ The practices of the palanquin bearers also varied according to the community; for example, the *Mahār* in Konkan placed the bamboo on the shoulder, the *Kunbī*, on the head¹⁸ (vide Fig. XXX, e.). As regards the displacement of heavy loads which also necessitated work in groups, especially on building sites, the most common method (still in use today) consisted of the suspension of the load from the middle of a pole posed on the shoulders of two men in the same fashion as was the bamboo shaft of a palanquin (vide Fig. XXXVI, a., b.). To move a long object (pillar or beam), one proceeded in like manner, hanging it at its ends from two poles (vide Fig. XXXVI, c.).¹⁹ Often it was indispensable to take recourse to a more complicated method, utilizing an assemblage of wooden pieces, the number of which varied according to the weight of the object to be moved. For example, in the quarries of North India, the procedure for raising a large stone block was to attach it between two long shafts, themselves connected by means of a series of transversal pieces which crossed at regular intervals the bamboo stems. It was possible to add other bars arranged in the same manner, so as to

16. One of the most luxurious was the palanquin with fringes (*jhālardār pālktī*); there were others of a more ordinary type (*caupālā, muhāfah, miānah*); some were simple hammocks suspended from a pole, called *dolī* in the northern plains, *mañcal* on the western coast and *dāñdī* in the Himālaya (vide Solvyns' prints, *Les Hindous*, t. III, s.v. *d'jehalledar, t'chaupar, mohhafa, mejanah, d'hoully*; Hobson-Jobson, 313-4, 596, 296).

17. The emperor was borne in a *takht-i-ravān*, or travelling throne, the women of the *haram* in a *cañdol* (Bernier, *Voyages*, t. II, 215-6, 218). The princes of the empire also used another litter called *nālktī* (Hobson-Jobson, 615). The *jhappān* should also be mentioned, an unsophisticated chair made of bamboo and carried on two poles, which was used in the Himālaya (Hobson-Jobson, 462-3; Forster, *Journey*, vol. II, 2).

18. Fonseca, Goa, 34. The *Bombay Gazetteer* (vol. X, 41) specifies that in the district of Ratnāgiri the *Kunbī* carried litters on the head by means of transversal sticks affixed to bamboo.

19. Two bas-reliefs in Khajurāho, dating from the ninth to twelfth centuries, depict men transporting blocks of stone in this fashion (vide Vidya Prakash, *Khajurāho*, 127-8, photos Nos. 53 and 54, f.p. 89 and 104). An *Akbar-nāmah* miniature in the Victoria and Albert Museum, London, also illustrates this procedure. It should be added that according to local tradition, the megaliths of the Khāsī Hills in Āsām would have been hauled from the quarries where they had been hewn to the place where they were then erected on wooden wheels by a multitude of men harnessed with cane-fibre ropes (Gurdon, *The Khasis*, 154). In North India, when one wanted to transport large stone pillars, massive wooden wheels were affixed at the extremities and, by means of cables linked by crude winches, were then moved in the desired direction (Ball, *Manual of the Geology of India*, part III, 544).

distribute the load among a greater number of bearers (vide Fig. XXXI). Generally, this structure was as heavy as the object to be transported. The coolies lined up beside the bamboo (two at each piece) and, at the signal from the head of the group, hoisted it to their shoulders.²⁰ This method (also practised in China)²¹ enabled that large loads be transported over a great distance.²²

Power of the Human Motor

The efficiency of the human motor varied according to the conditions of the region. In the plains or on the plateaux of the peninsula, where high temperatures prevail throughout most of the year, the muscular effort demanded of the bearers was not great, and the few figures available to us are relatively modest. Buchanan, at the time of his investigations in South India and Baṅgāl, has noted several. The average load borne on the head of the *kulī* of the Maṅgaḷūru region on the West coast was 33 kilos;²³ this was also the weight which the *bahaṅgī-bardār* of the Dinājpur district in Baṅgāl accepted to take over a day's distance of 19 km.²⁴ The weight limit was 27 kilos in the Purṇiyā

20. *Selections from the Records of Government, North-Western Provinces*, vol. V, 316 n., and Ball, *Manual of the Geology of India*, part III, 544. In a quarry located in the Ilāhābād region, a rock weighing 45 *man*, or 1,700 kilos, was hewn and 64 men were used to convey it to the Jamunā, where it was awaited by a boat (*Selections*, *op. cit.*, 302-8).

21. In fact, this procedure was also commonly practised in China. Major Adrich, in *Papers on Subjects connected with the duties of the Corps of Royal Engineers* (vol. X, 1849, 153-5), describes how in Hong Kong 36 Chinese coolies transported with ease columns of 2,000 kilos over a distance of 800 metres. There is in that article a detailed plan (pl. IV), with scale, of this assemblage of wooden pieces, as well as a sketch showing the coolies at work and the manner in which the different wood pieces were arranged during transport.

22. Seely (*Ellora*, 70) recounts how at the beginning of the nineteenth century fourteen men transported along the difficult trails of the Western Ghāṭs a barrel containing 360 litres of wine attached to a solid bar, itself affixed by straps to seven smaller wood pieces which were placed on the nape of the neck. This method is still employed on the tracks of the Himālaya. Brook Northey (*Land of the Gurkhas*, 132) describes the conveyance of tractor parts carried by some 100 people advancing but some 100 metres a day across the mountains separating India and Nepāl on slopes of 25° to 35°. He adds that the heaviest one-piece objects to have been transported across the mountains are the statues of prime ministers, each weighing four tons. Landon (*Nepal*, vol. II, 179) published a photograph showing how an enormous crate was borne by some hundred persons. In *National Geographic Magazine* (vol. 123, No. 3, March 1963, 415) a photograph taken by Desmond Doig portrays the transport in the Sikkim mountains of a trunk carried on a simpler bamboo construction. These pieces are not placed on the coolies' shoulders, but conforming to indigenous methods, are attached to a head-strap.

23. Buchanan, *Journey*, vol. II, 389.

24. Martin, *Eastern India*, vol. II, 1016. That was probably the maximum load

district²⁵ and 25 kilos in the hilly zone of the Western Ghāts between Panavel and Pune.²⁶ These numeric evaluations are quite summary and it is probable that there were appreciable differences according to region and usage, but one might reasonably estimate that the maximum load from the Gangetic Plain to Cape Comorin varied from between 25 and 33 kilos.

A greater amount of data is available pertaining to the muscular force of the Himālayan populations, because portage was there an object of systematic observation on the part of European travellers. The figures thus given situate the average load between 27 and 36 kilos pro individual under normal conditions,²⁷ but it is practically certain that previously (and even today, when a higher wage is promised) men bore greater loads. Furthermore, the factor of altitude must be considered, which affects differences in efficiency. In Kaśmīr the *kulī* bore, on the Ladākh trails, loads of 67 kilos;²⁸ whereas, on the Rāvalpiṇḍī route during the period of fruit harvest they could cover 320 km in twelve days (a daily average of 26.6 km) with back-baskets containing apples weighing from 72 to 108 kilos.²⁹ According to a study made by Pant,³⁰ the bearers in the Kumāyūm mountains, at an altitude of above 3,500 metres, cover from 16 to 24 km a day with bags weighing from 26 to 36 kilos on their backs;³¹ while at a lower altitude, they commonly march with loads of more than 72 kilos, and the more robust among

accepted by the bearers. Buchanan specifies that in Dinājpur he was unable to find people who wanted to do this work, even offering twice the normal rate (*ibid.*, 1016).

25. It should be further noted, that regionally the rate prescribed by custom was the same, whether borne on the head, or balanced on the shoulder (*ibid.*, vol. III, 349).

26. Seely, *Ellora*, 36, 70.

27. Estimates by Drew (*Northern Barrier*, 83) regarding Kaśmīr, by Pant (*Social Economy*, 205) for Kumāyūm, by Toni Hagen (*National Geographic Magazine*, vol. 117, 1960, 366) for Nepāl, and Waddell (in Crooke, *Things Indian*, 109) for Sikkim.

28. Vigne, *Travels*, vol. II, 66.

29. Biscoe, *Kashmir*, 33, 64-5. Drew (in Crooke, *Things Indian*, 109) gives examples of men who transported, one of them, a crate containing four dozen large bottles of beer, the other, a load of 86 kilos, and cites the case of a *kulī* who conveyed a load of 108 kilos over a distance of more than 160 km along the difficult trails of Kaśmīr, despite the altimetric contrasts imposed by the relief (one of the passes had an approximate altitude of 3,000 metres).

30. Pant, *Social Economy of the Himalayas*, 205.

31. On the tracks of the Upper Satlaj the *kulī* carried loads of from 35 to 45 kilos, according to Lloyd (1821) (*Narrative*, vol. I, 253). At the close of the nineteenth century, according to Gore (*Lights*, 28), the maximum loads did not exceed 31 kilos.

them can even carry loads of from 108 to 144 kilos!

Buchanan (Hamilton)³² estimated in 1819 the usual load of the Nepalese bearers to be 45 kilos, while conceding that the stronger men could well march with twice that weight. Hodgson,³³ in the mid-nineteenth century, recommended to the British government that the goods destined for the Kāthmāṇḍū basin be distributed in parcels weighing 72 kilos, adding that the Nepalese transported 'that surprising weight' across the mountains. Farther to the east, in the Khāsī Hills, the maximum load varied from between 36 to 54 kilos;³⁴ near Dorjeling, the *kulī* from the plantations commonly bore crates of from 50 to 58 kilos, and those who provided the conveyance of merchandise in the Tibetan frontier could during the day climb and descend the steep slopes with loads of from 70 to 90 kilos on their backs.³⁵

It should be noted that in some regions women also assumed an important role in portage.³⁶ Tavernier³⁷ observed that in Nepāl, among those who lived from caravan traffic, 'the greater part consists of women and girls who come to negotiate with those of the caravan, to carry men, merchandise and provisions beyond these mountains'. The women of the Himālaya are particularly hardy. We encountered north of Kāthmāṇḍū, at an approximate altitude of 3,000 metres, a female *sherpa* marching with an enormous tree trunk on her shoulders.³⁸ At the close of the nineteenth century, a robust mountain woman was reputed to have carried a piano from the plains to the Nainītāl station!³⁹

32. Buchanan (F. Hamilton), *Account of the Kingdom of Nepal*, 233.

33. Hodgson, *Essays on the Languages*, 98.

34. *J.R.G.S.L.*, vol. II, 1832, 94.

35. *B.D.G.*, *Darjeeling*, 136.

36. Which does not imply that today on the village level the situation regarding domestic needs would have changed: the transport of loads is generally confided to them, and it is common in the countryside to encounter a man walking with brisk strides followed by his wife, bent under the weight of voluminous bundles. Among the fishermen in the Madrās region, it is usually the women who carry the fish to market in a basket placed on their heads; they proceed two-by-two at a brisk rate, passing the basket from one to the other every 300 metres or so.

37. 'This is the method by which they carry them. The women have a strap on the shoulders to which a large cushion hanging on the back is attached; upon it the man seats himself. It takes three women who change in turns, to carry a man' (Tavernier, *Travels*, vol. II, 206).

38. The *Sherpas* make in this domain no distinction as to sex, and women bear loads as do the men (vide Fürer-Haimendorf, *Sherpas*, 12-14, 81).

39. Crooke, *Things Indian*, 110. Francke (*Antiquities of Indian Tibet*, part I, 10-11) relates that in 1909 in the upper valley of the Satlaj, travellers' baggage was carried by the women of the villages. Also in the plains to the North, as in the Merāṭh region, when the bearers were of insufficient number, the women accepted to be employed to transport the loads (Skinner, *Excursions* (1832), vol. II, 206-8).

Efficiency and Training

How to explain the bearers' often exceptional endurance?⁴⁰ One cannot advance nutrition as a reason, for their diet is generally very poor; nor, particular aptitudes which would be specific to certain ethnic groups. It seems that the augmentation in terms of efficiency, as well as the reduction of energy expenditure, would be principally a matter of conditioning. Through training, by disciplining the nervous and muscular systems, the human organism can attain to a remarkable efficiency as directed towards a determined objective.⁴¹ The palanquin bearers on the West coast were accustomed since infancy to the friction of bamboo on the shoulder; when the callosity formed in the area thus treated became insensitive, they could then tolerate the load without discomfort.⁴² In Nepāl, the *Sherpas* learn at an early age to carry the back-

40. Theoretically the maximum weight which a man on a normal regimen can carry is approximately equivalent to his own body weight, let us say 70 to 75 kilos; which supposes a much greater strength for those muscles involved in the work. Thus, one would have found for the shoulder and neck muscles a maximum of 150 to 200 kilos (vide Sorre, *Fondements de la géographie humaine*, tome II, 1ère partie, 220). This explains the exploits of dockers and removal men over short distances; but those are exceptional conditions having nothing to do with portage over longer distances in regions of very hilly or irregular terrain, such as in the Himālaya. By way of example, we give here the results of personal experience. We undertook by foot some thirty years ago during the month of May, i.e. when the temperatures are higher, sustained by a poor diet (wheat cakes, rice and *dāl*) pilgrimages to the sources of the Gaṅgā, from Rṣikeś to Kedarnāth (400 km round trip). We had been conditioned by several years of hiking and carried a load of approximately 25 kilos. Over the greater part of the distance the track followed the river's course and presented no great slopes; we covered then regularly 32 km pro day. But, the two last stages lead rapidly to almost 4,000 metres altitude and demanded a much greater physical effort. Hence, we could only cover about 12 km a day. The native bearers made approximately the same stages; they were generally older than we, weighed less and sustained themselves on a less rich diet. Now, some carried in their back-baskets stout pilgrims weighing from 70 to 90 kilos! On the return to the plain, these men were apparently fresh and energetic. We had lost at least ten kilos.

41. Monserrate (*Mongolicae*, 112), recalling the extraordinary couriers employed by Akbar, states that these men had been trained from infancy: 'Among the dispatch bearers there are some couriers who can run as fast as a rider at top speed. Their livers are removed (?), one says, when they are infants, so as to preclude that they suffer from shortness of breath. They are trained to run with leaden shoes or undergo the discipline of raising their feet and moving their legs without pause, the while remaining in place, and such that their heels touch the buttocks. When they doff their leaden shoes, they are magnificent runners, thanks to whom the king can obtain very rapidly and regularly the news, or dispatch orders regarding all that involves the peace of his realm'.

42. *Bombay Gazetteer*, vol. XV, part I, 79.

basket, which they do not remove during their marches.⁴³ In order to combat fatigue, the *kulī* also know very effective massage techniques⁴⁴ and other diverse expedients.⁴⁵ The training would also appear to be enhanced by the consumption of certain stimulants, such as Indian hemp (*bhāṅg*), palm alcohol (*tārī*) and opium. Earlier, the bearers as well as the couriers made much use thereof.⁴⁶ The question, in any case, is not so summarily resolved, because the human motor is not of a mere mechanical simplicity.⁴⁷

Expansion of Porterage

Pedestrian traffic predominated throughout the Himālayan Range,⁴⁸ as

43. Personal observations.

44. According to Biscoe (*Kashmir*, 65), the *kaśmīrī* bearers had themselves massaged along the way when they were fatigued: the man lay on his stomach extended on the ground and his companion, while standing on his body, slowly massaged his muscles, from head to foot, with his toes. When the procedure had ended, the first rendered the same service to the second, and both jauntily resumed the march. This type of massage reminds of that which the *kathakalī* dancers of Kēraja receive, except they did not use oil.

45. Pant (*Social Economy*, 206) mentioned a very curious custom among the *Bhoṭiyā* of Kumāyūm: when they sense that their load is too heavy, they increase the weight by putting one or two large stones picked up along the way in their back-baskets, which necessitates a supplementary effort over a period of time. Then, they remove the stones, and relieved, no longer feel themselves to be overburdened. The same attitude prevails regarding the cold: when the low temperatures become intolerable, and they have no reserve clothing with which to cover themselves, they remove their blanket for some time, exposing themselves to the cold, then re-cover themselves and feel thus warmed. As in the curious story of the man who hit himself on the head so that, when ceasing to do so, he would feel better!

46. Grose (*Voyage*, 187-8), discussing the endurance of Indian couriers, writes: 'They cover their route speedily by means of the large amounts of opium which they consume. They maintain that this use of opium gives them strength and precludes fatigue while underway.... Not only the *pattamares* consume opium, but all labourers and bearers take recourse to it. It is very certain that those latter charge themselves with loads which the most vigorous Europeans would dare not undertake to carry. I was assured that those people take at a single dose, without being indisposed, as much as one ounce of opium and they attribute to this drug the ease with which they tolerate the most tiresome labours'. Vide also Abbé Carré, *Travels*, 226-7, 274; Forbes, *Oriental Memoirs*, vol. I, 64.

47. Neither should one forget that these extraordinary bearers age quickly, that very early their legs are covered with enormous varicose veins, and that they are completely worn-out when they abandon their profession, as we have on several occasions verified. It is thus necessary to be circumspect when speaking of the resistance of so-called 'primitive' peoples.

48. Man, who perspires less than a poney, is very sure-footed; he can pass

well as along the littoral and in the Western Ghāts. Reading the ancient travel accounts, one has the impression that the great Himālayan valleys were peopled by caravaneers and that, on the main tracks, during the fair-weather season groups of bearers were always ready to convey goods and merchandise across zones of difficult terrain.⁴⁹ An idea of the amplitude of these movements is won, if one considers that along the only passageway from Bhīmbar to Śrīnagar the Mughal emperor could assemble, according to Bernier's estimates,⁵⁰ 30,000 bearers!

This mode of transport was also very common along the thin strip of the Western coast, incised by large rivers, and on the abrupt slopes of the Ghāts, covered daily by hundreds of people, such as the *kulī* of whom Abbé Carré spoke,⁵¹ who made their way back and forth between Govā and Bijāpur, bearing on their heads dried fish and coconuts over a period of some 25 or 30 days, linking thus the plain to the plateau.⁵²

Conversely, in those zones in which animal transport or cartage were widespread, portorage over long distances was not of such primary significance. In Bihār and Baṅgāl, excepting in the case of specialized castes, such as the *Moṭiyā* of Dinājpur, who were stevedores, bearers did not accept wares or goods and only took the baggage of travellers.⁵³ Furthermore, in many areas, but few were to be found.⁵⁴ In the districts of Bihār and Śāhābād, weavers and cobblers were exempted from certain taxes, on the condition that they bear the personal effects of those travellers who approached them.⁵⁵ These professions are little known to us; the scant information which we have been able to glean concerns the palanquin bearers, who throughout India enabled the rapid and relatively comfortable conveyance of travellers.

Pālkī-Bardār

The real status of the *pālkī-bardār* eludes our knowledge, for they are only mentioned incidentally. In North India, they were recruited from

through places which animals could not traverse, in particular at high altitudes (Pant, *Social Economy*, 204).

49. Forster, *Journey*, vol. I, 247-8.

50. Bernier, *Voyage*, t. II, 251; *Travels*, 392.

51. Carré, *Travels*, vol. I, 226-7.

52. Fryer (*New Account*, vol. I, 320) observed the same phenomenon between Vasai (Bassein) and Junnar. Buchanan (*Journey*, vol. II, 111, 389) makes similar remarks concerning the significance of portorage in Malabar.

53. Buchanan, in Martin, *Eastern India*, vol. III, 349; vol. II, 288.

54. *Ibid.*, vol. II, 581.

55. *Ibid.*, vol. I, 387, 560.

the *Kahār*⁵⁶ caste. Two sub-castes were especially active in Bihār at the time of Buchanan:⁵⁷ the *Ravānī* of Paṭnā and the *Kharvār* of Sāran. In Baṅgāl were the *Ḍuliyā*;⁵⁸ however, the most appreciated by European travellers were the bearers of Oṛisā, called 'oorya bearers' in the documents of the period.⁵⁹ In the southern part of the peninsula, they belonged to the *Bōyi* or the *Besta*.⁶⁰ Today, the members of these castes exercise different professions and have for the most part forgotten their past, except for certain communities of the Deccan which have retained in their traditions the recollection of the migrations of their ancestors: palanquin bearers in the service of Aurāṅzeb, they were to have established themselves in the South in the wake of the emperor's campaigns at the close of the seventeenth century.⁶¹

The *pālki-bardār*, then, constituted local and regional groups characterized by a close professional solidarity. Organized according to the customs and regulations of their caste, they were answerable to an assembly, directed by a chief who was charged to defend their interests, but who was also responsible for their conduct.⁶² They were consigned

56. *Kahār*, derived from *skandha-kāra* (Skt.), he who carries on the shoulder. The name is mentioned by Ibn Baṭṭūṭah, circa 1350 (*Voyages*, tome III, 415). *Hobson-Jobson* (495) gives a number of references, s.v. *kuhar*. Vide the chapters dealing with this caste in Crooke, *Tribes of the North-West Provinces*, vol. III, 92-101; Risley, *Tribes of Bengal*, vol. I, 370-5; Enthoven, *Castes of Bombay*, vol. II, 125-6; Russel, *Tribes of the Central Provinces*, vol. III, 291-6.

57. These sub-castes still exist today, among others, mentioned by Risley (*Tribes of Bengal*, vol. I, 371). The most numerous sub-caste in Central India is that of the *Dhīmar* (Russel, *Tribes of the Central Provinces*, vol. III, 291).

58. Solvyns, *Les Hindous*, t. III, s.v. *d'hoully*. According to Risley (*op. cit.*, vol. I, 374), *Ḍuliyā* is the name given to the *Kahār* residents of Baṅgāl. There also existed at the end of the nineteenth century Muslim bearers called *Ḍolīvālā*, and all bearers not of the *Kahār* caste were called *Mahrā*.

59. Vide Carey, *Good Old Days*, vol. I, 170.

60. *Bōyi* (Kan.), *Bōyī* (Tel.), *Bhoī* (Mar.); *Besta* (Kan., Tel.). Vide the numerous references given in *Hobson-Jobson*, 110-11, s.v. *boy*. According to Buchanan (*Journey*, vol. I, 190), the palanquin bearers (*Bōyī*) in Maisūru belonged to the *Besta* caste, and it was also from a similar caste that they were recruited in the Maṅgaḷūru region. The *Bombay Gazetteer* (vol. XV, part I, 79) confirms that on the west coast the bearers belonged to certain sub-castes of fishermen. In 1852, Louis de Charolais ('Pondichéry il y a 100 ans', *Revue historique de l'État de Pondichéry*, vol. IX, 1955, 159) noted that in the Madrās region the bearers were originally from the Kōraṅgi coast: 'It is a single caste in India, the cradle of which is the Coringui coast, which has the training monopoly of palanquin bearers, agile, indefatigable and whose cadenced march is a gentle undulation. Just as the Savoie provides for all of Europe the stove setters, and the Auvergne spreads throughout the rest of France its stock of colliers and water-bearers, so the Coringui coast is the coolies' college'.

61. Enthoven, *Castes of Bombay*, vol. III, 125-6; Hasan, *Castes of the Nizam's Dominions*, 300; Nanjundayya, *Mysore Tribes*, vol. III, 502-3.

62. Tavernier, *Travels*, vol. I, 38.

to groups of a size variable according to the distance to be covered: for a very short journey, two men sufficed to bear a simple litter; four were allocated to a palanquin. However, over long distances during which frequent relays were necessary, at least eight and generally twelve people were requisite,⁶³ with, in addition, torch bearers (*mas'alci*)⁶⁴ during night marches. They were to nourish themselves along the routes, and Forbes⁶⁵ has left a vivid description of their evening activities at the resting stages, beneath a tree or in a *sarāe*, some occupied with the preparation of the fire, cleaning the clay pots and cooking, the others resting or being massaged or recounting stories to stay the tiredness of their comrades until completion of the meal.

Very resistant and dextrous, supporting themselves while marching on a stick to avoid stumbling, they were able in the hot sun or rain, on rocky irregular terrain or in miry marshes, to bear their palanquin at a rapid and supple pace, sometimes marking the rhythm by chanting. They relayed while marching and with such adroitness that the change went unnoticed by the passenger, and could cover a daily distance of between 25 and 40 km,⁶⁶ for a meagre monthly salary of three or four rupees.⁶⁷

Organization

This system did not, however, function in a uniform manner. In the

63. Tavernier, *Travels*, vol. I, 38; Anquetil Duperron, *Zend*, t. I, XXIII. Usually 'the palanquin is carried by four men, two in front and two behind, who are positioned beneath the intersecting support; that is two bear it on their right shoulder, the two others on the left. Four others accompany them, so as to replace them when they are tired' (Dupeuty-Trahan, *Le moniteur indien*, s.v. *palky*).

64. Vide the references given in *Hobson-Jobson*, 601-2. In the case of journeys undertaken by important personages (prince or nobleman), the *palki-bardār* were accompanied by several other servants preceding, surrounding or following the palanquin, to watch over the comfort and security of the distinguished passenger. Several domestics marched ahead to clear the way, another bore the parasol (*chātā*) to protect his master from the sun, yet others bore betel, *huqqah* or *morchal* (fly-swatters made from peacock tails); finally, there were the *pīādah* (armed valets) and *harkārah* (messengers) (Bernier, *Travels*, 283; Careri, *Travels*, 160; Solvyns, *Les Hindous*, t. III, s.v. *d'jehalledar*).

65. Forbes, *Oriental Memoirs*, vol. II, 278.

66. Dupeuty-Trahan (*op. cit.*, s.v. *palky*) writes that 'the usual pace of the bearers is four to five miles an hour'. Forbes (*op. cit.*, vol. II, 155) specifies that they covered three to four miles an hour during five-hour march. According to Tavernier (*Travels*, vol. I, 38), they covered an average of 13 to 14 leagues (41 to 44 km) a day. Bowrey (*Geographical Account*, 87) indicates 40 miles!

67. Tavernier states (*op. cit.*, vol. I, 38) that they received four rupees monthly, and five rupees when the journey exceeded fifty days; according to Thévenot (*Travels*, 76), nine to ten francs monthly; Abū'l-Fazl (*Ā'in*, vol. I, 264) states that the bearers employed by the emperor received 120 to 160 *dam* (4.8 to 9.5 rupees).

larger cities the *pālki-bardār* associations were particularly well organized for long-distance transport and private individuals could always hire teams of bearers for a specified itinerary on the main roads or the pilgrimage routes.⁶⁸ However, in the smaller towns or in the country, the range of the bearers seems to have been much more limited. In eastern India, at the time of Buchanan's study, many private individuals possessed litters or palanquins, but very few could permit themselves to maintain a team of *Kahār*, excepting the large proprietors and their representatives, who gave them lands in exchange for their services. The majority thus only hired bearers when there was a specific need. They were to be found in the greater number of settlements and were generally available, except during the marriage season, from April to July, during which period they were almost daily in demand in the villages. At that time travellers had great difficulty in finding *Kahār*, even for short journeys. The remainder of the year these latter accepted to convey people over shorter distances from village to village; in other words, within a relatively limited radius.⁶⁹

Only the sovereigns had the means to maintain permanently large groups of bearers. The royal court at Vijayanagara utilized not less than 20,000 litters and palanquins.⁷⁰ The Grand Mughals employed several thousand *pālki-bardār*,⁷¹ who probably played a role analogous to that of the 'dawk bearers' maintained by the English *Company* at the close of the eighteenth century. This was tantamount to invoking the operation of the postal system prior to the advent of the machine age.

*The Transmission of News*⁷²

The dispatch of correspondence took place primarily by means of

68. Carey (*Good Old Days*, vol. II, 70) reports that in May 1803 it was almost impossible to find *pālki-bardār* in Kalikātā, because the *oriyā bearers*, who ensured the greater part of the palanquin transport (there were approximately one thousand), had accepted to convey the rich local merchants of the city to Purī on a pilgrimage to Jagannātha.

69. Buchanan, in Martin, *Eastern India*, vol. I, 125 (Bihar); vol. II, 703 (Dinājpur); vol. III, 120 (Purīyā). He moreover specifies that it was difficult to find men who accepted to cover 12 or 14 miles, even if a good compensation was promised.

70. According to Nuniz, in Sewell, *Forgotten Empire*, 370.

71. *Ā'in*, vol. I, 264.

72. We have no intention to give here a history of the Indian postal system. On this subject, the following works might be consulted: Syed Sabahuddin, 'The Postal System during the Muslim Rule in India', *Islamic Culture*, vol. XVIII, July, 1944, 269-82; 'Early Days of Postal Administration, I, A succinct Account', *Bengal Past and Present*, vol. XXII, Nos. 43-4, June 1921, 159-200; B.K. Sarkar, *Inland Transport*, 72-82; Saran, *Provincial Government*, 421-3; Misra, *Central Administration*, 415-49; Nayeem, *History of Postal Administration in Hyderabad*; Geoffrey

professional couriers. Granted, the Muslim sovereigns, who established a postal service in India based upon the model of the Arab *barīd*, utilized horse-back⁷³ or camel-riding⁷⁴ messengers for the conveyance of mail, and on exceptional occasions pigeons were employed.⁷⁵ However, the normal agent of transmission, for states as well as for private persons, was everywhere the foot courier, known in the Mughal period by different names: *pattamar*,⁷⁶ *harkārah*,⁷⁷ *qāsid*,⁷⁸ *ṭappi*,⁷⁹ *pāyik*,⁸⁰ *jāsud*.⁸¹ Individuals in rural India scarcely had the means to send their messages, which were thus confided to wayfarers, monks or pilgrims.⁸² The local *rājās* had their dispatches conveyed, within the boundaries of their territories, from village to village by communal agents, *caukīdār* or *kotvār*.⁸³ Nevertheless, private postal services existed in many towns. Merchants employed them at their own expense, and in the Paṭṇā of 1620, for example, all letters were given to professional messengers

Clarke, *The Post-Office in India and its Story*; Ivie G.J. Hamilton, *An Outline of the Postal History and Practice, with a History of the Post Office in India*. It should be noted that in the vernacular languages, the terms corresponding to our word 'post', *ḍāk* in the North, *ṭappāl* (Mar.), *ṭappālu* (Tel.), *ṭapāl* (Tam.) in the South, designated originally the relays established from place to place to transmit news.

73. Vide *infra*, 232 and n. 26.

74. Vide *infra*, 238 n. 65.

75. The Muslims of the Middle East made much use of carrier pigeons, but this usage does not seem to have been firmly implanted in India; there was no supporting tradition and the birds risked going astray in the clouded skies and storms of the monsoon. Nevertheless, Jahāngīr utilized several to transmit the news from Māṇḍu to Burhānpur, but he himself specified that it was not common and that he had done so to emulate the postal pigeons of the Abbassids (*Tūzūk*, vol. I, 387). Pelsaert (*Jahangir's India*, 58) mentions that, in case of necessity, the king had pigeons to convey letters. Manucci (*Storia*, new edition, vol. II, 438-9) states that they were used at the imperial court to remain apprised as to the movements of the sovereign. Since the end of World War II, the Orīṣā police use some one thousand carrier pigeons to convey messages in the wooded regions and those of difficult terrain (vide the article by Anjali Pal: 'Pigeons in the service of Orissa Police', in *Sunday Standard*, 15 December 1974).

76. *Pattamar*: this word designates a certain ship on the Konkan coast; however, in many European documents of the seventeenth and eighteenth centuries, it signifies *foot courier*. Vide the references given in *Hobson-Jobson*, 687.

77. *Harkarah* (H.), courier, envoy, spy (*Hobson-Jobson*, 430).

78. *Qāsid* (Ar., H.) courier, runner (*Hobson-Jobson*, 262-3).

79. *Ṭappi* (Tel.), courier.

80. *Pāyik* (H.), courier, messenger.

81. *Jāsūd* (Mar.), courier.

82. Even the Maratha chiefs in Orīṣā at the close of the eighteenth century utilized the itinerant monks out of fear that their messages would be intercepted by the enemy (Ray, *Orissa under Marathas*, 157).

83. As was the case in the ancient state of Rīvā in Baghelkaṇḍ until the mid-nineteenth century (*C.I.S.G.*, vol. IV, *Rewah State*, 47-8).

who could be found in the main *bāzār* and were known under the name of *bāzār qāsid*.⁸⁴ The European Companies employed such couriers; agents of the *East India Company* repeatedly make reference to them in their correspondence,⁸⁵ and Ānanda Raṅga Piḷḷai never fails to mention in his diary the brahmins in the service of Dupleix who conveyed the letters from Mahé to Pondicherry.⁸⁶

The autocracies which succeeded one another in India during the Muslim era possessed the means to improve the procedure and establish relays at which the couriers could replace each other. They organized thus the transmission of news in a systematic manner to the exclusive benefit of the sovereigns.⁸⁷ The distance separating the post

84. *Factory Records*, Patna, vol. I, 29 December, 1620 and 17 September 1621; Mundy, *Travels*, vol. II, 367-8.

85. Vide inter alia, *E.F.*, 1618-21, 11, 181, 266; 1630-33, 57 n. 4, 110, 160; 1634-6, 152; Wilson, *Early Annals*, vol. II, part II, 4, 8, 12, 16, 21-2, 24, 30, 44, 90, 130, 141, 160, 185, 217, 222-4, 227, 230-1, 236. Vide also the information collected by Nayeem, *Hist. of Postal Administration*, 27-31.

86. Ānanda Raṅga Piḷḷai, *Diary*, vol. II, 165, 194; vol. III, 302, 408; vol. IV, 200; vol. V, 213; vol. VI, 82, 125; vol. IX, 133, 188.

87. The royal postal system conveyed administrative correspondence, diplomatic dispatches, information of a military nature, and at times transported persons or things, but remained essentially a state monopoly. Ibn Baṭṭūṭah (*Voyages*, t. III, 95-6) has left a description of the system as it functioned during the period of Muḥammad Tughlaq (circa 1340): 'The *barid* in India is of two types. Regarding the post as conveyed by horse, it is called *ālāq*. It is effectuated by means of the sultān's horses, stationed every four miles. As for the post as conveyed by foot courier, it is constituted as follows: each mile is divided into three equal distances, called *dāvah*, which means third of a mile. The mile is termed by the Indians *kuroh*. Now, at every third part of the mile there is a well-populated settlement, outside of which are three tents where men are seated and ready to set forth. These people wait in readiness, and next to each is a whip of two cubits' length whose upper part terminates with copper bells. When the courier leaves the town, he holds his letter in one hand, and the whip with bells in the other. He thus sets off running with all his strength. When those in the next tents hear the noise of the ringing bells, they make themselves ready to receive the courier and, at his arrival, one of them takes the letter and in his turn sets off at greatest speed. He shakes his whip until he has arrived at the next *dāvah*. These couriers do not halt until the letter has arrived at its destination.

This type of post system is more rapid than that utilizing horses, and often those fruits of the *Khorāsān* which are sought after throughout India are transported by this means. They are placed on a platter and conveyed at a run until having arrived at the sultān. It is also thus that criminals are transported: each of these are put in a seat which the couriers put on their heads and with which they march at running pace. Finally, it is in the same manner that the drinking water for the sultān is transported when he is in Daulatābād. One bears him water drawn from the river Gaṅgā where the Indians go on pilgrimage; this river is some forty days distant from the city'. (Concerning the transport of fruit by the couriers of the Mughal era, vide *Tūzuk*, vol. II, 170; Tavernier, *Travels*, vol. I, 246.)

Tavernier (*Voyages*, 184; *Travels*, vol. I, 233) gives further information regard-

stations was not uniform. They were only 1 km distant from one another in the network as established by Muḥammad Tughlaq: each runner, at maximum effort, covered this distance in approximately five minutes, then relayed the message to the next — which goes to explain the extraordinary rapidity of the dispatch of information in this period: 260 km a day.⁸⁸ On the Mughal roads, the length of the stages to be covered by the messengers was much greater and, according to the diverse information which we possess regarding this subject, varied from 10 to 20 km.⁸⁹ At the time of Aurangzeb, the postal route from Ajmer to Aḥmadābād (486 km) was punctuated by 27 relays with an average intervening distance of 18 km, and permanently occupied 62 runners; that from Aḥmadābād to Bharuc (169 km), to which were attached 35 messengers, comprised sixteen stages of some dozen kilometres each.⁹⁰ In British India at the beginning of the nineteenth

ing the conveyance of messages at the time of Aurangzeb (circa 1650): 'But it should be remarked that in India all the letters which kings, generals of armies, and governors of provinces send by footmen go much faster than by horsemen, the reason being that at every two leagues there are small huts, where two or three runners are posted, and immediately when the carrier of a letter arrives at one of these huts he throws it to the others sitting at the entrance, and one of them takes it up and at once starts to run. It is considered unlucky to give a letter into the hand of the messenger; it is therefore thrown at his feet and he must lift it up'.

Parsons (*Travels*, 225) observed around 1775 the relay system adopted by Haidar 'Alī in the Maisūru kingdom: 'From the capital to every part of the sea coast, they receive letters in 30 or 34 hours, which is at the rate of 10 to 12 miles an hour. At the distance of every 10 or 12 miles (according to the situation) is built a watch tower of stone in which are placed 5 or 6 men, 2 or 3 of whom are remarkable for running very fast. The first man who sets off as a courier, as soon as he gets in sight of the first tower, displays a white handkerchief at the end of his stick, if by day, if by night fires off a pistol, when immediately another man is made ready, which is done by oiling his joints with cocoanut oil, as he is naked (excepting a cloth about his waist). This man takes the paquet from the first, and thus is handed on in succession at each stage. They run from stage to stage within the hour'.

88. 'Between the Sindh province and the sultān's residence, which is Dehlī, there is a march of 50 days. When the news officials write from Sindh to the sultān, the letter reaches him in the period of five days' (Ibn Baṭṭūṭah, *Voyages*, t. III, 94). According to Rennell (*Memoir*, 1792, 323), the distance from Taṭṭā to Dehlī by trail was 810 miles, or 1,300 km, which makes a daily average of 260 km!

89. The distance separating the relays was two *kos* (8 km) under Sher Šāh (Elliot, *History of India*, vol. IV, 417); five *kos* (20 km) under Akbar (Firištah, transl. Briggs, *Hist. of the Rise of the Muham. Power*, vol. II, 173-4); two *kos* (8 km) under Aurangzeb (Tavernier, *Travels*, vol. I, 233); ten miles (16 km) at the beginning of the eighteenth century (Hamilton, *New Account*, vol. I, 150); from ten to twelve miles (16 or 19 km) in the kingdom of Haidar 'Alī (Parsons, *Travels*, 225).

90. *Mir'āt-i-Aḥmadī* (Suppl.), 151-2. The author gives the names of all the relays of the imperial post between Ajmer and Bharuc. They are, moreover, all

century, the *dāk-caukī* were separated by similar distances.⁹¹ These regional variations corresponded mainly to practical considerations, such as the proximity of a settlement, or the existence of a watering place.

Speed

The couriers did not circulate at the same pace. The private postal services utilized by the merchants took into account reasonable delays and normally demanded that their messengers cover daily distances of from 40 to 50 km;⁹² to convey urgent messages, they could obtain from them, by promise of recompense, average rates of 60 and even 80 km.⁹³ The messengers employed by princely courts were to have sustained an accelerated rhythm, determined by precise regulation.⁹⁴ When commanded to run at maximum pace without halt, impressive speeds could be achieved. Some among them accomplished over very long distances scarcely credible exploits. Bābur recounts in his memoirs⁹⁵ that Bīān

located along the Mughal main highway.

91. The distance between the post-houses of the different *Presidencies* varied from six to eleven miles (9.6 to 17.6 km), according to a report anno 1836 reproduced in *Bengal Past and Present*, vol. XXII, 1921, 173.

92. The figures which we have gleaned indicate that the runners covered on the average each day: 52 km from Taraṅkampāṭi (Tranquebar) to Madrās (264 km in five days, Thévenot, *Travels*, 128); 45 km from Mahé to Pondicherry (550 km in 12 days, Ānanda Raṅga Piḷḷai, *Diary*, vol. III, 165, 194); 45 km from Taṭṭā to Surat (902 km in 20 days, *E.F.*, 1634-6, 152); 41 km from Macilipattanam to Pondicherry (627 km in 15 days, Ānanda Raṅga Piḷḷai, *Diary*, VI, 125); from 43.5 to 36.2 km from Āgrā to Surat (1,088 km in 25 or 30 days, *E.F.*, 1618-21, 266 n. 4); 36 km from Govā to Madrās (720 km in 20 days, Love, *Vestiges*, vol. I, 198).

93. In Paṭnā in 1620-21, the *bāzār qāsid* who conveyed the letters to Āgrā covered the distance (870 km) in 15 days, sometimes 25 days; but under good conditions they made the journey in only 11 days, at an average rate of 79 km each day (*Factory Records*, Patna, vol. I, letters of 29 December 1620 and 17 September 1721, in Mundy, *Travels*, vol. II, 367-8). In Dehlī, 1716, the English ambassador to the Grand Mughal court, John Surman, reckoned 15 or 20 days to dispatch a letter to Surat (1,029 km) by the 'nimble cossids' (*qāsid*) by making them 'fair promises' (Wilson, *Early Annals*, vol. II, part II, 90). The exigencies of certain messengers were on occasion exorbitant; in a letter of 1 August 1716, Hugh Baker requests the payment of Rs 25 to a *qāsid*, which represents for that time an enormous amount (*ibid.*, 130).

94. At the time of Aurangzeb, the runners responsible for postal relations between Dehlī and Aḥmadābād were to cover one *jarībī-kos* (4 km) in one *gharī* (24 minutes), according to *Mir'at-i-Aḥmadī* (Suppl., 151); during the era of Tipū Sultān in Maisūru, the messengers had to cover this distance in 1½ *gharī* (or 36 minutes), under pain of being whipped (Tippoo Sultan, *Select Letters*, cited in Hobson-Jobson, 373).

95. *Bābur-nāma*, vol. II, 621 and n. 5.

Śaikh, in the service of Humāyūn, covered in 1528 a distance of 1,878 km, from Kiśm (in Badakhshān) to Āgrā, in 31 days; and that on another occasion, he went from Qila'-i-zafar (in Badakhshān) to Qandahār (928 km) in eleven days, making thus an average of 60 and 80 km a day respectively. In 1627 a Hindu messenger, Banārasī, brought to Śāh-jahān at Junnar, in the Deccan, the news of Jahāngīr's demise from the Kaśmīr frontier (1,600 km) in twenty days, at a daily rate of 80 km.⁹⁶ In, Rājasthān, the *qāsid* of the *darbār* of Bikāner linked this city to Jaypur (272 km) in three days and nights and, when necessary, in 42 hours. One runner has been remembered, who covered 50 *kos* (or 135 km) in eight *pahar* (or 24 hours), but generally the very good couriers covered within the same period of time, at the maximum, 110 km. One might assume that under normal conditions a messenger could attain an average of 60 to 80 km at a stretch.⁹⁷

With the relay system, the news was conveyed more rapidly and the distances covered exceeded 100 km pro day. In 1652, during the siege of Qandahār, express messengers transmitted the emperor's orders from Kābul to the former city (508 km) in four days.⁹⁸ On 22 March 1707, Muḥammad Mu'azzam, in Jamrūd (20 km west of Peśāvar), learned of the death of his father, Aurangzeb; the message had taken twenty days to arrive from Aḥmadnagar, located at a distance of 2,240 km.⁹⁹ During the period of Akbar's reign, along a regular postal route, such as that from Āgrā to Aḥmadābād (854 km), urgent dispatches were communicated in five days, making daily average-rate of 171 km.¹⁰⁰

Following these principles, the English *Company* succeeded in developing an excellent postal organization, permitting it to link the vital centres of British acquisition. Between Kalikātā and Madrās (1,760 km), for example, letters were carried, prior to the beginning of the eighteenth century, by private messengers in two or three months; as of 1712, a relay system was established permitting the period of transmission to be reduced to approximately 30 days.¹⁰¹ In 1789 the system

96. According to Mu'tamid Khān, in *Iqbāl-nāma*, cited by Prasad, *Jahangir*, 308, 402.

97. *Rajputana Gazetteer* (Erskine), vol. III, A, 354. At the close of the eighteenth century, the *qāsid* linked Kābul and Peśāvar (336 km) in four days, at an average daily rate of 84 km (Elphinstone, *Caubul*, 243).

98. Sarkar, *History of Aurangzeb*, 1973 edition, vol. I, 91.

99. Irvine, *Later Mughals*, vol. I, 18.

100. Firīstah, transl. Briggs, *History of the Rise of the Muham. Power*, vol. II, 173-4.

101. In 1712 the *Company* posted eight teams of *qāsid* at different places along the Madrās route: two at Fort William, two at Bāleśvara, two at Gañjām and two at Viśākhapaṭṭaṇamu. From there, the governor of Madrās had foreseen *tappi* to ensure the transmission of news to the southern metropolis (Wilson, *Early Annals*, vol. II, part I, 45).

was further improved and messages arrived in nineteen days.¹⁰² Ten years later, at the time of Wellesley, a more rational distribution of post stations diminished yet further the route time, and no more than twelve-and-one-half days were required between the two cities.¹⁰³ At the outset of the nineteenth century the system was improved once more: in 1824 especially well-trained couriers covered the distance in ten days and one hour;¹⁰⁴ on 13 February 1836, the achievement of the last two express messengers from Madrás was announced, who reached Kalikātā in seven days and thirteen hours and seven days and sixteen hours respectively.¹⁰⁵ This average rate of 230 km in 24 hours approaches the 260 km covered by the messengers of Muḥammad Tugh̃laq.

At the same time as they organized the dispatch of letters and parcels (*ḍāk-bahaṅgī*), the English envisaged the creation in 1778 of a special service on the roads radiating around Kalikātā charged with the conveyance of *Company* employees and eventually of private individuals. To this purpose they recruited a large number of specially chosen *Kahār*, at the recommendation of the village headmen, consigned to teams commanded by a *sardār* and comprising eight *pālki-bardār*, two *maṣ'alci* and one *bahaṅgīvālā*. Relayed every ten miles (16 km), they were, in principle, to cover 96 miles (153 km) a day.¹⁰⁶ In fact, their rate varied according to itinerary, and they attained on the average only some 100 km daily.¹⁰⁷ They are known in the annals of the English *Company* as the 'dawk bearers'.

102. Just as the travelling times along the route between Madrás and Mumbai, which were 28 or 33 days, were reduced; a first time to 20 or 25 days, then to 17 days (Love, *Vestiges of Old Madras*, vol. III, 344).

103. Vide the information concerning the years 1796-1800, collected in tabular form by Misra, *Central Administration*, 433.

104. 'We have to record a wonderful rapidity in the transmission of the *ḍāk*. An express arrived from Madras in the extraordinary short period of 10 days 1 hour; being 5 hours less than ever before known, *Journal of Calcutta*, cited by Seely, *Ellora*, 86).

105. Letter from the *Post Office Committee* to the Government, from 13 February 1836, reproduced in *Bengal Past and Present*, vol. XXII, Nos. 43-4, June 1921, 176.

106. This organizational plan, perfected by Capt. John Harvey, was accepted by the Governor-General in July 1778 (vide Misra, *Central Administration*, 436-40; Carey, *Good Old Days*, vol. I, 491).

107. In 1813, one required 5½ days from Kalikātā to Paṇṇa (675 km), 3 days from Kalikātā to Dhākā (273 km) and 2½ days from Kalikātā to Bāleśvara (249 km) (*Bengal Public Consultations*, 21 May 1813, cited by Misra, *Central Administration*, 440). Seely (*Ellora*, 70-1) relates that at the time of an official journey in Western India organized by the collector of the district, he and his family covered 270 miles, without halting, day and night, in four palanquins with 56 bearers who relayed every ten miles.

Begār

In conclusion it remains to mention that, prior to the pax britannica, the sovereigns and the powerful abused the human motor by coercing certain categories of the population to bear loads, as and when required for their travel or the necessities of war. In normal times, this forced labour of *begār* affected only several lower castes, who could be requisitioned by the large proprietors to effectuate diverse transport.¹⁰⁸ Modave¹⁰⁹ discovered in the Avadh province a curious custom which obliged the women (probably of low caste) to bear gratis travellers' baggage from one village to the next. In hilly regions, such as the Himālayan border, the *begār* was yet more wide-spread, and every personage having some authority considered those of low extraction as his beasts of burden. When the emperor went to Kaśmīr, the governor of the province and the local chieftains assembled thousands of people to transport the personal belongings of the royal guests.¹¹⁰ In the Pañjāb of Rañjīt Singh, where no one could journey without permission, Hugel¹¹² noted that the bearers were forced by the authorities to fulfill their duty gratis. When the armies marched, it was common to mobilize the poor in the countryside to have them carry the loads. There were thousands in the Maratha armies who, as states Broughton,¹¹² were fed at the expense of the general and earned a few pence by selling grass or wood during the halts.

These inevitable exactions demonstrate that despite its relatively low efficiency quotient, human energy played an important role in transport and communications, which was also greatly dependent upon the motive power of animals.

108. Habib (*Agrarian System*, 150 and n. 52, 248 and n. 35) has found documents proving that the *Balāhar*, the *Thorī*, the *Dhānuk* and the *Camār* were obliged to serve as bearers for the *zamīndār*. It is furthermore significant that the *Camār* were also called *Begārī*.

109. Modave, *Voyage*, 202.

110. Bernier, *Travels*, 392.

111. Hugel, *Travels*, 34.

112. Broughton, *Letters*, 170. The same system existed in the Sikh armies (vide Bajwa, *Military System*, 212-3).

2. Animal Portelage

The complex of animal motive force, in India as elsewhere, is very ancient and linked with the origins of domestication. One will not attempt here to determine at which time and under which conditions quadrupeds were initially employed to generate mechanical energy.¹ It will be sufficient to our purposes to constate that, on the vast Indian subcontinent, diverse animals were trained for transportation: bovines (oxen, buffaloes, yaks), cameloids (dromedaries), equidae (horses, mules, donkeys), elephants and even ovines and caprines (sheep and goats).

We shall begin with the discussion of the most localized types in the Himālayan mountains.

a. EMPLOYMENT OF DIFFERENT SPECIES

Firstly, those pack animals closely confined to the Tibetan border should be mentioned, the yaks, the *dzo* and the migrating herds of goats and sheep which nourished themselves on the meagre pasturage at stopping places, and which played a significant role in transhimālayan commerce prior to the closure of the frontiers.

Yaks and Dzo

The yak (*Bos grunniens*),² a long-haired bovine with a horse-like tail, living at an altitude of between 3,000 and 6,000 metres, is the caravan animal par excellence on the Tibetan plateau. Being robust, it transports with ease 70 to 80 kilos in deep snow, but adapts with difficulty to

1. Among the kinds of animals used for transport, the ox (*Bos indicus*) seems to have played a major role in the pre-historic civilization of western India. In comparison, the horse, which was perhaps already domesticated at that period, would not appear to have been fully employed until the Vedic period. Other animals, such as camels, elephants, mules, donkeys, goats and sheep, seem also to have been included in the livestock of the ancient inhabitants of the Indus Valley. In any case, they are to be found on the monuments dating from the beginning of the Christian era (vide Srivastava's clarification, who collocated information provided by archaeological and literary sources in *Trade*, 135-45).

2. Yak, *gYag* (Tib.). Turner (*Embassy*, 185-90) has given a detailed description along with an engraving (pl. X) representing 'the Yak of Tartary'. Vide *Hobson-Jobson*, 975-6, which gives an excellent historic note; Watt, *Commercial Products*, 733; Pant, *Social Economy*, 210. Teichman (*Travels in Eastern Tibet*, 223) describes the ways (Tibetan and Chinese) of arranging loads on their backs.

climatic change. Therefore the *Bhoṭiyā*, particularly in the western part of the mountain chain, prefer to utilize hybrids, such as the *dzo*,³ which can tolerate the cold of very high mountains and the heat of low valleys. Docile and hardy, they convey across rocky terrain and glaciers the load of three bearers at a pace of 5 to 6 km an hour.

Sheep and Goats

At the same altitudes, the least costly means of transport are the sheep and goats which graze alongside the trails and which are then killed when no longer useful. All merchandise which can be distributed in small loads, such as wool, grains, salt or borax, is consigned to them in stitched bags consisting of two double leather pouches placed on the back of the animals like saddles and attached by means of chest-straps and cruppers.⁴ Sheep can carry loads of from 5 to 11 kilos over a daily distance of some 8 km; they usually follow behind the more hardy goats, which carry from 7 to 18 kilos of merchandise in their bags.⁵ These animals march four or five hours in the morning at an average pace of 2 km an hour; at mid-day they are unloaded and then graze until fall of night. Formerly, extensive movements took place following the melting of the snows, from June to October, between the valleys and the upper mountain, permitting the transport of grains in one direction and of Tibetan salt in the other. The caravans could undertake five journeys during this period, which represents a substantial traffic; for even estimating an average load of 6 kilos carried by each

3. *Dzo*, *mdzo* (Tib.); *mdzo-po*, male, *mdzo-mo*, female; hybrid of yak and cow. There are others utilized as beasts of burden, in particular the *bri-mdzo* or *garjo*, bred by a bull and a female yak, but they do not have the hardness of the *dzo* (vide *Calcutta Review*, vol. 18, 1852, July-Dec., 98-9; *N.W.P.G.*, vol. XII, *Himalayan Districts*, 143; Pant, *Social Economy*, 210 and photograph f.p. 224, showing a *dzo* bearing its load (two large bags) fastened by ropes to a simple carpet).

4. A photograph of a goat loaded with a shoulder bag is to be found in Pant, *Social Economy*, f.p. 224. Regarding sheep herds of Ladākḥ, vide Cunningham, *Ladākḥ*, 210-1; Biscoe, *Kashmir*, 207-8; concerning those of the Satlaj Valley and Māna Pass, vide *I.G.*, vol. XII, 495, and *N.W.P.G.*, vol. XII, *Himalayan Districts*, 91.

5. The loads entrusted to sheep were from 6 to 12 *ser* (5.6 to 11.1 kilos) in Bhūtān, according to Pemberton (*Report on Bhootan*, 70); 40 lbs (18 kilos) in Sikkim, where loads could be transported 12 miles (19 km) daily, according to Hooker (*Himalayan Journals*, vol. I, 272); the load in Nepāl was 42 lbs (19 kilos), according to Kirkpatrick (*Nepaul*, 134), or 80 lbs (36 kilos) according to Hamilton (*Nepal*, 214); Tavernier states (*Travels*, vol. II, 206) that billy goats could carry as much as 150 lbs (68 kilos)! In the regions of Garhvāl and Kumāyūn the load of sheep was estimated as varying between 5 and 12 *ser* (4.6 to 11.1 kilos) and that of goats from 8 to 20 *ser* (7.4 to 18 kilos) in the *Calcutta Review* (vol. 18, 1852, 98) and according to *N.W.P.G.* (vol. XII, *Himalayan Districts*, 143) and Pant (*Social*

animal, it is recorded that 30,000 sheep could convey 900 tons of merchandise during the summer season.⁶

At the next lower altitude, i.e. less than 3,000 metres, primarily ponies and mules were utilized, which will now be considered along with the horses of the peninsula.

Horses

Horses assumed in former days almost no role in the rural and economic life of the Indian plains. Allocated to the more aristocratic occupations of war, pageantry or riding,⁷ rather than to servile chores, they were almost never employed for pack or draught. Lively and light saddle animals, they were used in such great number in the armies or princely courts, that the Indian breeding centres could not satisfy the

Economy, 207). In the Satlaj Valley, according to Gore (*Lights*, 14) the Tibetan goats carried 16 lbs (or 7.2 kilos).

6. *Calcutta Review*, *ibid.*, 99; *N.W.P.G.*, vol. XII, *ibid.*, 143. It should be added, that the goat and the ram seem to have been used at an earlier date as beasts of burden or draught in the Indian plains, for ancient texts make allusions to this effect (vide Srivastava, *Trade*, 144-5). One has even found a Gandhāra sculpture representing a pair of rams harnessed to a cart (C.M. Kar, *Classical Indian Sculpture*, fig. 49). Della Valle (*Travels*, vol. I, 185) recounts that at the beginning of the seventeenth century he saw in Govā a ram, saddled and with bridle and stirrups, mounted by a young Portuguese.

7. As far as can be ascertained from the literary sources, the horse was initially used in India to draw a light war chariot, which played an important role in battles until the Christian era, at which time it was definitively eliminated by the rapid development of the cavalry. The importance of the saddle horse encouraged Indian breeders to select lively and swift breeds and to neglect the draught horses, hardier, but less agile. But, in any case, they could not have competed with the oxen as far as transport was concerned, as the latter were much better adapted to the climatic conditions. These questions pertaining to the origin and differentiation of horse breeds have not been thoroughly studied; nor have the training methods or harnessing techniques been examined fully. From what is presently known (vide our book, *Horses and Riding Equipment in Indian Art*), one can say that in ancient India, riders used not only the snaffle-bit, but also the cavesson (a bitless device) and the combination of the two; they also knew, beside the horse-cloth, the padded saddle and the rigid saddle. Hanging loops serving as foot-rests seen in some carvings dating back to second century B.C. third century A.D. point out that the germ of the stirrup idea was already there, but very likely Indians did not become familiar with the real stirrup until the ninth and tenth century. The thirteenth century appears to be a crucial period for the evolution of the horse-harness; the old complicated headstall is replaced by a more simple one, the saddle, growing hollow, becomes a large seat, the breast-plate and the martingale are commonly used, finally the nailed horse-shoe is introduced in the subcontinent; the rider has thus at his disposal all the pieces constituting the modern harness, except the curb-bit which appears in documents of the sixteenth century.

demand, and thus over the centuries it was necessary to import in large numbers horses from Arabia, Persia or Central Asia.⁸ This foreign stock probably served to improve, through cross-breeding, the local races.

Indigenous Races

There existed in the India of the Mughal period several good breeds of light horses.⁹ The most highly esteemed were those of Kacch and of Kāthiyāvāḍ, issues of Arabian and indigenous cross-breedings which are probably ancestors of today's *kāthiyāvāḍī* and *marvārī*, the best of India's horses.¹⁰ But there were others equally robust, ensuing of the breeding centres of the Pañjāb or the regions of Āgrā and Ajmer.¹¹ The most common horses of the northern plains, *taffū* and *tāzī*, were not of such high quality.¹² On the other hand, horses of a small breed with

8. This movement, effectuated by way of sea and the routes of the North-West, is mentioned by the majority of European travellers subsequent to Marco Polo. The importation of horses was a monopoly of the Muslims until the sixteenth century; then, it made the fortune of the Portuguese, who were the exclusive suppliers of the southern kingdoms. Nuniz (in Sewell, *Forgotten Empire*, 362, 294) states that the Vijayanagara king purchased each year 13,000 horses from Ormuz for his own use and that of his captains. The inexpediencies and hazards of this system can be easily imagined: during these long and tedious voyages by sea, as well as upon arrival during the period of acclimation, the loss of animals must have been appalling; which would explain their elevated cost price far exceeding the average rate. However, the sovereigns did not shrink back from the expenditure, so much did they value the presence of these animals necessary in their armies (vide, inter alia, the information collected by Mahalingam in *Economic Life in the Vijayanagar Empire*, 111-12).

9. It is probable that the pax britannica, in reducing the significance of princely armies and, at the same time, diminishing the demand for horses, dried up the breeding sources and brought about the degeneration of good breeds, such as those of Kacch which have almost disappeared. On the other hand, the need for more powerful animals, better adapted to the conditions of modern warfare, is at the origin of artificial cross-breeding, in view primarily of size, and has produced larger but badly proportioned horses (Watt, *Commercial Products*, 750).

10. *Ā'in*, vol. I, 140; Finch, in *E.T.*, 174; Forbes, *Oriental Memoirs*, vol. II, 185-6; Modave, *Voyage*, 327.

11. *Ā'in*, vol. I, 140; Modave (*Voyage*, 326-7) specifies: 'There are as well in the djongols (*jaṅgal*) of Lahor several large stud farms which provide a good number of horses. These have the attractiveness of Persian horses combined with the strength of those of Turkestan'. The *Sikh* were in fact great horse breeders and Rañjīt Singh maintained numerous stud farms in the various regions of the Pañjāb (Fauja Singh Bajwa, *Military System*, 208).

12. 'The most common breed is that which one calls tatous. One can be had for from 15 to 50 rupees and the greater part of the cavalymen are mounted on this mean breed. I have seen some as small as our Corsican horses which were very firey, light-footed and attractive' (Modave, *Voyage*, 327). Vide *Ā'in*, vol. I, 244-5.

exceptional endurance were to be found in the Deccan, and it was with these horses that the Marathas and the *Pendhārī* (*Pindārī*) undertook their extraordinary cavalcades.¹³ Lastly, the excellent Himālayan ponies should be noted, such as the *gunṭh* of the western mountains and the *tāṅgan* of Bhūṭān.¹⁴

Grooming

These animals required extensive care. The Mughal emperors, at whose bidding many were to come from abroad, were particularly interested in their grooming. Akbar created a special department responsible for the imperial stables. Meticulously detailed administrative regulations, as have been described by Abū'l-Faṣl,¹⁵ defined the functions of a specialized staff of inspectors, grooms, veterinarians and experts who examined the pedigree of the animals,¹⁶ etc. The horses were categorized according to their origin and qualities.¹⁷ Thus, one distinguished in order of descending efficiency: the Arabian, Persian, *munjanna* (akin to the Persian horses), the *turkī*,¹⁸ *yābū* (issue of cross-breeding with local races), and finally the indigenous horses, *tāzī*, *jaṅglah* and *ṭaṭṭū*.¹⁹ Modave saw in this classification, which also determined the manner in which the animals were fed, groomed, harnessed, etc., a veritable caste system.²⁰

Concerning the *tāzī*, *ṭaṭṭū* and *jaṅgali* of the Purṇiyā and Dinājpur districts, vide Buchanan, in Martin, *Eastern India*, vol. II, 703-4; vol. III, 117-8, 269, 348. Other references are to be found in *Hobson-Jobson*, 902-4.

13. Broughton (*Letters*, 45-6) describes those he saw at a Sindhiyā camp; Shakespear (*Wild Sports of India*, 241-9) gives details of the breeding regions and horse markets in Maratha country at the beginning of the nineteenth century.

14. *Ā'in*, vol. I, 140; Finch, in *E.T.*, 181; Pemberton, *Report on Bootan*, 71-2; Buchanan, in Martin, *Eastern India*, vol. II, 703-4; vol. III, 117-8; *Hobson-Jobson*, 387, 898.

15. *Ā'in*, vol. I, 140-50.

16. Regarding the importance which experts attached to certain markings on the animal, as well as its colour, vide Parks Fanny, *Wanderings*, vol. II, 9-12, and Crooke, *Things Indian*, 255-6. The characteristics (markings, colours, etc.) of good horses are systematically compiled in Sanskrit treatises; vide *Asvaśāstram*, by Nakula.

17. *Ā'in*, vol. I, 243-4.

18. According to Modave (*Voyage*, 326), 'those from Turkestan are large and heavy but excellent in terms of endurance. Those from Persia are finer and of a more beautiful colouring and have a pleasant bearing'.

19. At the time of Aurangzeb, horses were still classified in about the same manner (Irvine, *Army*, 51).

20. 'Horses are divided into castes, as are men, either with respect to the country of origin, or based upon the mixture of breeds and other such circumstances. The specific names of the castes are Iranian to designate Persian horses,

Their alimentation was basically pea-mash, and the care given them was based upon massage.²¹ Horses which were to be mounted were equipped with bridle, saddle, stirrups and shoes, as in the West,²² but the fabrics were more colourful with embroidery and pompoms.²³ However, the Indian bit seems to have been particularly harsh²⁴ and the horse-shoes quite weak.²⁵

Turkish to indicate those issuing from Turkestan, that is to say from Balk and Bocara, tazis, tangones, tatous' (Modave, *Voyages*, 327). Evidently, the price varied according to those criteria. In Akbar's time, they were to be found for an amount varying from between Rs. 2,000 and 5,000 (*Ā'in*, vol. I, 150). At the close of the eighteenth century, the most common breed (*taṭṭū*) valued between Rs. 15 and 50, but one could not have a decent mount for less than Rs. 300 to 400; and, when it was the question of a horse of known pedigree, fantastic sums might be given. Particularly the Arabian horses were 'very few in number and of an exorbitant price' (Modave, *Voyages*, 327). This last detail shows that in the declining empire the Arabian horses had become too costly and, no longer being imported as before, they no longer assumed the first place in the imperial stables. Vide the figures given by European travellers (Finch, in *E.T.*, 174; Ovington, *Voyage*, 150-1; Pyrard de Laval, *Voyages*, vol. II, 67; Linschoten, *Voyage*, vol. I, 54; Tavernier, *Travels*, vol. I, 302; Fryer, *New Account*, vol. I, 295) mentioned by Sarkar (*Inland Transport*, 24-5). Mahalingam (*Economic Life*, 111-2) has compiled Nuniz's information (in Sewell, *Forgotten Empire*, 294, 343, 362), and that of Varthema (*Travels*, 1863 edition, 126) and Barbosa (*Book*, vol. I, 210).

21. There were generally two men to tend to a horse: the groom (*sā'is*), responsible for its grooming and care, and the grass-cutter (*ghasiyārā*), who watched over its feeding. Fodder being rare, the animal was given diverse beans (of which *kofflu* in the South) cooked with clarified butter (*ghī*) and sugar (Thévenot, *Travels*, 62-3; de La Flotte, *Essais*, 350). This is as was prescribed by the imperial regulations (*Ā'in*, vol. I, 142-3). At times a more strengthening food was provided: mutton boiled with rice, of which a kind of mash was made. Marco Polo observed it being prepared on the east coast, and Modave in the east of *rājput* country; even today it is fed to those horses in the Kacch which render a great effort (Crooke, *Things Indian*, 255; Modave, *Voyage*, 469). Rather than currying the animal, it was massaged to refresh it, and it seems that it was frequently purged so as to enable it to better tolerate the great heat (de La Fotte, *Essais*, 350). Some European experts have highly criticized this alimentation which, by causing a deterioration of the liver, was responsible for a very high mortality of horses in the princely stables (vide the remarks made by R. Wallace, in Kipling, *Beast*, 185-7).

22. In *Ā'in* (vol. I, 143-5 and pl. XVI, f.p. 144) a description is to be found of the harness of the Mughal horses, as well as a plate of sketches showing the different parts. Vide also Irvine, *Army*, 72.

23. Thévenot, *Travels*, 63.

24. Vide Kipling (*Beast*, 191-2) who gives (192) an engraving representing the different bits (*Indian 'thorn bits'*).

25. Ovington (*Voyage*, 150-1) states that the horse shoes did not last long. One of Akbar's regulations required that they be replaced twice yearly (*Ā'in*, vol. I, 145). Regarding the manner of shoeing horses in India, vide Moor, *Narrative*, 93-4.

Role

Horses were mainly employed in the cavalry or postal service,²⁶ and were retained by the wealthy for their private travel. When journeying, according to Burnes (who carefully studied their hourly pace),²⁷ they covered an average of 6 km in an hour in flat country such as the Pañjāb, and only 4.8 km in a region of more uneven terrain, such as Afghānistān. It is obvious that over short distances some fast horses could reach speeds approaching 60 km an hour, but the popular imagination has spun fantastic tales on this subject.²⁸

Horses were practically never used as pack or draught animals,²⁹ excepting certain common breeds, like the *tattū* of the Himālayan border, which carried loads of from 70 to 110 kilos over shorter distances;³⁰ a few other breeds were harnessed on occasion to light vehicles.³¹

The loads were reserved for the beasts of burden belonging to the same family, but more rustic and less highly esteemed: mules and donkeys.

Mules

Even though it would be an ideal pack-animal for transport in the mountains because of its endurance and sure-footedness, the mule has been used but very little in India, even in the Himālaya. Perhaps this fact is connected with the aversion the Hindus feel towards this type of hybridization, considered to be a monstrous act which mates an impure and ignoble animal (the donkey) with a noble and pure creature (the mare).³²

26. Based upon the Arabian model, the Muslim sovereigns established horse stations in North India, with a system of relays where couriers could change mounts. Syed Sabahuddin has collected the information provided by Muslim sources in *Islamic Culture* (vol. XVIII, July, 1944, 269-82: 'The Postal System during the Muslim Rule in India').

27. Burnes, *Travels*, vol. II, 147.

28. For example, the exploit of the rider who was said to have covered the route from Cittaūr to Gaur (which are separated by 1,280 km) in three days, which would be a daily average of 426 km! (Elliot, *History of India*, vol. IV, 418, n. 3).

29. Forbes (*Oriental Memoirs*, vol. II, 185) states explicitly: 'Horses are seldom employed for the pack or draft'.

30. Vide Buchanan, in Martin, *Eastern India*, vol. III, 269, 348.

31. Mrs Meer Hassan Ali (*Observations*, 323) noted in approx. 1830: 'I have never seen horses harnessed to any vehicle in India, except to such gentlemen's carriages as are built on the English principles'. Modave (*Voyage*, 119) had written some 50 years earlier in his diary: 'I do not believe that there are any countries with fewer horses. If the English had not maintained some for their barouches, the hunt and for other diversions, one would find almost none'.

32. Kipling, *Beast*, 227-8; Watt, *Commercial Products*, 752.

They were, nevertheless, bred in the Pañjāb, north of Rāvalpiṇḍī between Aṭak and Kaśmīr,³³ as well as from the Indus to Kābul.³⁴ Some mules were also to be found in the Eastern Himālaya, as in Bhūṭān, where they were bred from Tibetan donkeys and local mares.³⁵ Their qualities were esteemed by the Mughal emperors who reserved for them special stables³⁶ and used them when they travelled in the mountains to the north-west. They were usually confided with 'the baggage and kitchen appurtenances'.³⁷ The *sikh* armies employed them in the same fashion.³⁸ However, it does not appear that the mule played any noteworthy role in other regions.³⁹

Donkeys

The donkey, however, is to be encountered throughout India, especially in the semi-arid region to the west. Unfortunately, despite its qualities (strength and resignation), it is considered to be impure⁴⁰ and

33. *A'in*, vol. I, 160-1.

34. Elphinstone (*Caulbul*, 143) observed at the beginning of the nineteenth century that the quality of breeds of mules improved to the west of the Indus and that the Afghān mules were better than those of the Pañjāb.

35. Pemberton, *Report on Bootan*, 72.

36. *A'in*, vol. I, 160-1.

37. Bernier, *Voyage*, t. II, 201, 250; *Travels*, 359, 392.

38. Fauja Singh Bajwa, *Military System*, 209-11. They were also employed in Afghānistan at the beginning of the nineteenth century by the armies or wealthy individuals to transport baggage (Elphinstone, *op. cit.*, 143). They were the main pack animals in the Persian army (Irwin, 'Memoir on the Climate... of Afghanistan and the neighbouring Countries', *J.A.S.B.*, vol. VIII, 1839, 1012). According to Burnes (*Travels*, vol. II, 147), when charged with a light load they covered 4.8 km an hour. In Kumāyūm, the mules of the *Bhoṭiyā* which went to Tibet carried 2 *man* (approx. 75 kilos) (Pant, *Social Economy*, 209). Based upon Kumar's text (*Agriculture in India*, vol. III, 53), one might assume that they could cover from 24 to 32 km a day.

39. The English endeavoured to advance the breeding of mules (Watt, *Commercial Products*, 751-2). The Indians are today actively interested in this development, because of the strategic importance of the Himālayan frontier. The results are, however, as yet mediocre.

40. 'The vehicle of Alakṣmī and of Kālarātrī, the donkey is associated with the Gandharva cycle, no doubt through its quality as a lustful beast, serving in the ritual of expiation of sexual misdeeds. Its cry is held to be baneful' (Renou, in *Inde Classique*, t. I, 536). Forbes (*Oriental Memoirs*, vol. I, 410) emphasizes the abusive treatment to which it was submitted, and gives the example of Hindus, who would sacrifice one of these poor creatures so as to terminate a dispute. During the Mughal period, criminals were, prior to their execution, frequently marched through the streets facing backwards astride a donkey to the vociferation of the crowds. In certain remote villages this was but recently done to humiliate miscreants (Kipling, *Beast*, 90-1). This treatment is inflicted by the *Bañjārā* on men who have seduced an unmarried woman (Nanjundayya, *Mysore Tribes*, vol. II, 170).

thus reserved for those of lower caste. It is mainly the pack animal of the launderers (*dhobī*),⁴¹ as well as of certain pedlars of lower extraction.⁴² Buchanan⁴³ was surprised that the donkey would not have been more widely employed in commerce, for it was a more economical pack animal than oxen: a good donkey was valued then at five rupees and could cover three *kos* or 16 km daily with a load of some 40 kilos, all the while nourishing itself at practically no expense.

Elephants

The Indian elephant⁴⁴ is of smaller stature and less weight than that of Africa, and has a somewhat different profile. Its domain is today limited to forests and the Himālayan border, Āsām, the Western Ghāṭs, Maisūru and Central India. Formerly, however, its prevalence was more widespread and extended far into the plains of the North.⁴⁵ Its enormous size (3,000 kilos on the average) enabled it to deploy a considerable strength by means of its trunk, by sheer massiveness or by

41. Buchanan, in Martin, *Eastern India*, vol. I, 599; vol. II, 581; vide also *Ā'in*, vol. I, 162.

42. According to Buchanan (*Journey*, vol. I, 5, 143), the donkey was always used in Tamil country by five types of people, all of lower caste; the *Vanṇār*, or launderers; the *KuRavar*, who transported salt from the coast to the interior; the *KaNNār*, or tinkers; the *VaḷaiyaRkārār*, bangle merchants; and, a destitute group called *Ceṇcukkārār*. They were employed by some salt and grain transporters in Maisūru. Likewise in Paṭṇā (Martin, *Eastern India*, vol. I, 387).

43. Buchanan, *Journey*, vol. I, 416.

44. The elephant assumes a significant place in Hindu culture, in which it is at the root of representations of *Ganeśa*. 'Symbolic of power and wisdom, fragments of myth have been concentrated around elephants; their origin is held to be miraculous, and the image comparing them to clouds is more than a mere rhetorical figure' (Renou, in *Inde Classique*, t. I, 536). A good historical note regarding elephants is found in Watt, *Commercial Products*, 696-7, as well as in an article by H.W. Clarke, 'Notes on Elephants and their Transport by Railway', *Professional Papers on Indian Engineering*, 2nd series, vol. VIII, 1879, 243-99. The characteristics of good elephants (markings, colours, etc.) are to be found in Sanskrit treatises; vide *Maṭaṅgalilā* of Nīlakaṇṭha, *The Elephant-Lore of the Hindus*, *The Elephant Sport*, transl. by F. Edgerton.

45. According to the *Arthaśāstra* (book II, 50), elephants bred in Kāliṅga (coastal region situated between the Mahānadi and the Godāvarī), in Aṅga (Bhāgalpur region of Bihār), Karuṣa (zone in Kaimūr mountains), and in the eastern countries were the best; those of Daśārṇa (east of Mālava) and the western countries were of average quality; finally, those of Saurāṣṭra (Kāthiyāvād) and Pañcajanya country (in the vicinity of the Sarasvatī River) were of inferior quality. Abū'l Faẓl (*Ā'in*, vol. I, 129-30) mentions that during the period of Akbar they were found in the provinces of Āgrā, Ilāhābād, Bihār, Baṅgāl, Orīsā, Mālava and the Goṇḍvānā. Thévenot (*Travels*, 63) speaks of those from Gōlukoṇḍa and from Kocci (Cochin).

traction. It does significant work in the jungle or those zones of difficult access where heavy loads are to be moved. It is, nevertheless, whatever might be said, a delicate animal which does not tolerate exposure to the sun, and requires constant surveillance and care, while demanding abundant food.⁴⁶

Utilization

Having an 'armoured epidermis', the elephant was very much employed in military operations during the Hindu period.⁴⁷ Subsequent to the introduction of fire-arms to India at the time of Bābur, the elephant ceased to assume an offensive function in battles, and became no more than a parade animal and beast of burden.

Every prince, from the humblest *rājā* to the emperor, was obliged to possess a certain number. As Grose⁴⁸ wrote, 'nothing indeed is more suited to lend the impression of grandeur and pomp and to inspire veneration than to see a great personage majestically seated upon a throne at such height on such an enormous animal superbly caparisoned'. The Vijayanagara kings maintained several hundred,⁴⁹ and today the ruins of their stables can be seen which had once sheltered part of them in the centre of the ancient capital.⁵⁰ The Mughal sovereigns retained several thousand⁵¹ in special locations where they were tended to by a qualified staff.⁵² Only a few were intended for use during war; a goodly number among them were reserved for the tiger and lion

46. It is estimated in the Indian army that an average elephant requires a daily ration of 6.8 kilos of grains, 80 kilos of hay and 180 kilos of grass (90 kilos of hay and 215 kilos of grass for a large animal) (H. Singh, *Domestic Animals*, 114). In a country where forage is rare, this represents an enormous expenditure (vide in *Ā'in*, vol. I, 129-31, the rations given them in Akbar's army).

47. It would appear to have been domesticated during the Vedic period and employed in military operations during the subsequent epoch; its role was significant at the time of the Macedonian invasion and was progressively augmented during the first centuries of the Christian era. The elephant did not, however, prevent the Muslim cavalry from shattering the Hindu armies. Vide Chakravarty's excellent chapter (*Art of War*, 45-57) which concludes: 'The Hindus erred not in the use of elephants, but in the emphasis they put on that use'. Elephants being led to war are portrayed in the friezes of the Khajurāho temples (reprod. in Vidya Prakash, *Khajuraho*, photographs 40-4) and also in the Koṇārak temple (reprod. in Ganguly, *Konarak*, photographs 69-70).

48. Grose, *Voyage*, 248.

49. 400, according to Varthema (*Travels*, 1863 edition, 126).

50. Vide Longhurst, *Hampi Ruins*, 82 and photograph, 81.

51. 30,000 according to Coryat (in *E.T.*, 247); 14,000 according to Terry (in *E.T.*, 304) under Jahāngīr; 3,000 according to Careri (*Travels*, 218-9) under Aurangzeb. Tavernier (*Travels*, vol. I, 224) specifies that in Dehli the emperor had only 500, of which but 80 or 90 were intended for warfare.

52. *Ā'in*, vol. I, 123-39.

hunt; others were trained for single combat,⁵³ which was a favourite past-time of the court and attracted throngs of spectators; finally, others were used during journeys to convey the women of the harem as well as heavy baggage.⁵⁴ They were also employed by the large Hindu temples for processions.⁵⁵ Several princes of the eighteenth century, despite the great expense their maintenance entailed, surrounded themselves with a prodigious number of these creatures, simply to the purpose of personal gratification.⁵⁶ There were then litters, particularly large and heavy (*caṇḍol*), the shafts of which were attached by means of straps to the backs of two small elephants,⁵⁷ but 'the most superb and striking mounting' was a palanquin fitted atop the elephant, placed on a thick mattress covering the animal's back and held by ropes (neck-loop, girth-strap, crupper) to prevent its slipping to the sides or backwards. It was called *haudah* or *'amārī*, and its dimensions and decoration varied according to the stature of the animals and their functions (hunt, travel, war)⁵⁸ (vide Fig. XXXII, d.).

Thus the elephant, which can carry 400 to 500 kilos (being the equivalent of the load of eight donkeys or ponies, of five oxen and of three camels),⁵⁹ possesses a strength which is disproportionate to the ordinary work demanded of it in transportation. The elephant's domain remains the forest, whence it comes and where it renders exceptional service. Thus, when all is considered, it is recognized that apart from the ancient and mediaeval periods, during which it was employed as a machine of war, the elephant has been more an ornamental animal, enjoying an immense prestige, symbol of princely power and the wealth

53. Elephant combat is a favourite theme of Mughal miniatures.

54. Manucci, *Storia*, vol. II, 339-40; Bernier, *Travels*, 359; Tavernier, *Travels*, vol. I, 224; Irvine, *Army*, 175-6. In the Hindu principalities of western India, the elephant served also upon occasion in the execution of criminals (Crooke, *Things Indian*, 173).

55. Vide Buchanan, in Martin, *Eastern India*, vol. III, 117. Some large temples in the South, especially in Kēraḷa, possess hundreds of elephants which can be seen in processions at the time of important ceremonies.

56. Nizām-ul Mulk had taken 1,026 elephants with him during one of his campaigns in 1730. When he had a cannon fired to ascertain the extent of their habituation to the noise of fire-arms, there resulted such a headlong dispersion, that 306 soldiers were trampled to death by the enraged creatures. Āṣaf-ud-daulah, *navāb* of Avadh (1775-97), possessed more than 1,000 elephants which served no other purpose than to lend him an appearance of power, which he did not in fact have (Irvine, *Army*, 180).

57. As shown in a drawing by Mundy (*Travels*, vol. II, 190-1 and f.p. 192).

58. It is very often represented in Mughal miniatures (vide Verma, *Art and Material Culture*, 106 and pl. LXIX, 23-6). Vide also Bernier, *Voyage*, t. II, 216; Manucci, *Storia*, vol. II, 339-40; Tavernier, *Travels*, vol. I, 224; Irvine, *Army*, 175-6; Hobson-Jobson, 17, 427-8.

59. Kipling, *Beast*, 266; Humbley, *Journal of a Cavalry Officer*, 25-6.

of temples, than a genuine beast of burden. The role assigned to the elephant today in the plantations better corresponds to its nature and capacities. The most utilized pack animals in India were the camel and the ox.

Dromedaries

In the arid regions of India, the camel with one hump, or dromedary,⁶⁰ was raised in an extensive manner on a much larger scale than today.⁶¹ Its qualities are known: hardiness, perfect adaptability to desert conditions and the capability to live several days without water (but, when it does drink, it stores 60 to 70 litres). It is, furthermore, sufficiently supple to lend itself to diverse types of work: it can be mounted, loaded with heavy weights as well as harnessed to the cart or plough and the Persian wheel. On the other hand, it is not at ease in mountainous regions, on rocky tracks which injure its paws, nor on slippery terrain.⁶²

Generally these animals are classified according to their aptitude as pack or saddle animal. And, it was based upon such criteria that they were grouped in the imperial stables where, among the numerous breeds of camels (Ajmer, Nāgaur, Bīkāner, Jaisalmer, Bhaṭṭā and Bhaṭner, etc.), that of Kacch was especially esteemed and considered to be the best; that of Sindh excelled as a pack animal; while the Ajmer breed provided the swiftest animals.⁶³

60. The Bactrian camel, usually with two humps and corresponding to the climatic conditions of Central Asia, is unknown to India. There, only the so-called Arabian camel, or dromedary, always with one hump, is employed. The dromedary is also found in western Asia, south of the Caspian, and in the desert and mediterranean zone of Africa. It would seem to have been domesticated as early as the Harappan period. In any case, the classic texts speak of its employment, mainly in the armies, as pack and draught animal (vide Chakrvarty, *Art of War*, 57 n. 5, 103 n. 3; Srivastava, *Trade*, 144-5). The representation of mounted or loaded camels is rare in ancient monuments; nevertheless, a camel procession is depicted in the Lakṣmaṇa temple in Khajurāho (reprod. in Vidya Prakash, *Khajuraho*, photograph No. 50), as well as on the southern wall of the Vijayanagara 'throne platform' (reprod. in Longhurst, *Hampi Ruins*, 62, fig. 23).

61. With the development of irrigation and intensive deforestation of the northern plains, the zones of camel breeding gradually diminished, and today the dromedaries encountered in the Pañjāb and in Uttar Pradesh originate for the most part in the desert regions of Rājasthān and in Gujarāt (Kumar, *Agriculture in India*, vol. III, 69; Watt, *Dictionary of the Economic Products of India*, vol. II, 50-64).

62. It is held to be the most useful and least costly of domesticated animals in the rural life of arid India. As says the proverb: 'The camel can do everything for its master, except cook' (Kumar, *op. cit.*, 74, 67).

63. *Ā'in*, vol. I, 151. The best breeds during the Afghān war were judged to be, in order of decreasing efficacy, those of Bīkāner, followed by those of the Pañjāb and then those issuing from Sindh (Crooke, *Things Indian*, 76). According to

Pace and Load

Those dromedaries meant for use as saddled mounts,⁶⁴ light and nimble, can cover 60 to 80 km daily over ten to fifteen days at a stretch.⁶⁵ Well-fed and trained, the best among them are capable, if it be a matter of urgency, to cover twice that distance,⁶⁶ and exploits of this type are by no means rare in the desert annals.⁶⁷

The pack animals are equipped with a saddle⁶⁸ to which the load is affixed. At Akbar's time, regulations of usage restricted the load to six, eight or ten *man* (148, 198 or 247 kilos), respective of the different categories of camels.⁶⁹ The armies of British India only selected those animals capable of carrying 480 pounds (216 kilos).⁷⁰ In commercial caravans, there was no uniformity: the Sindh dromedaries, which by stages of 20 to 32 km provided the transport of merchandise as far as Qandahār traversing the gaps of the western border, were consigned

today's experts, the Bikaner dromedaries are the hardest saddle animals and the *Indian Camel Corps* uses only this breed (Kumar, *op. cit.*, 69).

64. The saddle for the dromedary (*kāthī*), which is remarkably decorated in the Pañjāb and Sindh, is comprised of two parts: at the rear is the passenger's seat, and at the front, that for the cameleer, who directs the animal by pulling its nose-ring with a simple lead (Baden Powell, *Handbook*, 132; Postans, *Personal Observations*, 108; Murdo, 'An Account of the country of Sind', *J.R.A.S.*, vol. I, 1834, 230).

65. In Akbar's royal stables, certain of the lighter camels were specially trained so as to rapidly cover long distances and to convey the imperial courier (*Ā'in*, vol. I, 155-6). The Muslim princes of South India retained several to convey news (Ānanda Raṅga Pillai, *Diary*, vol. II, 310). Father Coeurdoux (*Lettres édifiantes*, t. XV, 157) wrote in 1760 that the Moors of the Deccan used couriers mounted on dromedaries, named *asvārī* or *dāk asvārī*, who covered up to 50 *kos* a day.

66. Mundy (*Travels*, vol. II, 190) was told in 1633 that the camels employed in the postal service generally covered 70 *kos* daily (at least 150 km). The swiftest saddle camels were supposed to be those from Śiva (south of Jaisalmer); they are called *Rāma Thaliyā*, and are able to travel without difficulty a distance of 130 to 160 km in one night (*Rajputana Gazetteer* (Erskine), vol. III, A, 106).

67. The *Sukraniti* (ch. IV, II, 201-2) states that a good camel can travel 30 *yojana* (240 km) in one day, which seems improbable. Nevertheless, Charles Napier, at the time of a mounted expedition to capture a rebel chief, covered with his company of 'meharists' 112 km during one night, seized the bandit and returned to his point of departure during the day, having covered a total of 224 km in 24 hours! (Kipling, *Beast*, 281.)

68. This pack-saddle (*pālān*) is made of two arches connected by two cross-pieces; fashioned according to the size of the particular animal, it is individual and cannot be utilized for another (Baden Powell, *Handbook*, 132; Kumar, *op. cit.*, 72).

69. *Ā'in*, vol. I, 156 (*akbarī man* = 24.75 kilos).

70. Humbley, *Journal of a Cavalry Officer*, 25-6.



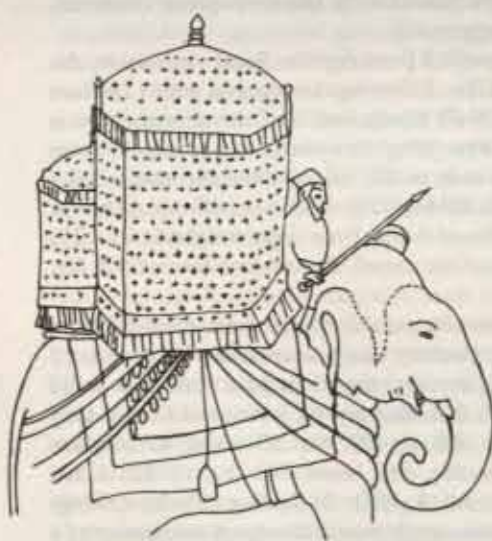
a.



b.



c.



d.



e.

XXXII. Animal portorage: a., b., c., pack-oxen (based upon drawings from the beginning of the 19th century: Solvyns, *Les Hindous*, t. III, s.v. *ladou-byl*, and G. Chinnery, drawing conserved at the *India Office Library* and reproduced in Archer, *British Drawings*, vol. II, 572, pl. 72); d., 'amāri or "princess seat"; e., seat of the same type on a dromedary (from Mughal miniatures of the *Bibliothèque Nationale*, Paris, reproduced in Manucci, *Storia*, vol. IV, f. p. 58 and 368).

loads of only 86 kilos;⁷¹ between Āgrā and Surat, in comparison, over less irregular terrain the strongest animals were loaded with up to 225 kilos.⁷² Normally, however, it was estimated that the camels could cover some 32 km a day with an average charge of from 150 to 200 kilos.⁷³

The dromedaries were utilized for very diverse tasks. Other than transport of merchandise they were employed among the nobility to convey the women in *muḥāfah*, the shafts of which were affixed by means of straps to the backs of two animals;⁷⁴ seats similar to the *haudah* could also be adapted to the dromedaries' humps⁷⁵ (vide Fig. XXXII, c.). Finally, women of modest status travelled in large baskets, known by the name *kajāvah*, attached by yokes to the animal's back.⁷⁶ They could also carry light cannons or *zambūrak*.⁷⁷ At the close of the last century, it was common to encounter on the roads of the Pañjāb large two-tiered vehicles, filled with passengers and harnessed to four or six camels.⁷⁸

71. 12 stones or 86 kilos (Murdo, 'An Account of the country of Sind', *J.R. A.S.*, vol. I, 1834, 230). According to the testimony of Steel and Crowther (*Purchas*, vol. IV, 26), because the sea route leading to Persia was closed as a result of the war, 12,000 to 14,000 camels loaded with goods set out in 1615 to Qandahār, whereas in normal times only 3,000 would have journeyed. Moreland (*India at the death of Akbar*, 206-7), estimating the average load carried by a dromedary to be 225 kilos, concludes that this traffic represented in the first case 2,700 or 3,000 tons, and in the second, 675 tons. If the figure provided by Murdo is given credence, Moreland's estimate would be much exaggerated.

72. In February 1619 goods were expedited from Āgrā to Surat via camels; the *pakkā* loads were 9 *man*, i.e. 222 or 267 kilos, following the adopted units (1 *akbarī man* = 24,75 kilos, 1 *jahāngīrī man* = 29,70 kilos); but, half the animals bore a lesser load. In December 1635, camels were hired to undertake a transport from Lāri Bandar to Tattā; *pakkā* loads of 6 *man* or 200 kilos (*śāhjahānī man* = 33,3 kilos) were reckoned (*E.F.*, 1618-20, 74; 1634-6, 125). Moreland (*From Akbar to Aurangzeb*, 340-1) estimates that the bales of indigo from Āgrā weighed some 250 lbs; as two such were affixed to the pack of the camel, that made a load of 500 lbs, or 225 kilos.

73. Burnes (*Travels*, vol. II, 148), following careful observations, found that on a road passing through the plains, appropriately charged dromedaries covered 2 miles 300 yards, or 3,5 km hourly on the average; that their pace was more rapid during the early hours than at night; and, that after having journeyed 41 km, they weakened. The load carried was from 300 to 400 lbs, according to Modave (*Voyage*, 328) and Jacquemont (*Découverte*, 55); some 500 lbs, or 225 kilos, according to Forbes (*Oriental Memoirs*, vol. I, 357). Following Crooke (*Things Indian*, 77), it can be estimated that seven camels would transport one ton over a distance of 32 km while marching from between 8 and 10 hours a day.

74. *Ā'in*, vol. I, 153.

75. Vide Manucci, *Storia*, vol. IV, illustration f.p. 392.

76. Forster, *Journey*, vol. II, 93-4.

77. Irvine, *Army*, 136-7.

78. *Ibid.*; Kipling, *Beast*, 281-8.

Indispensable animals, the dromedaries thus facilitated transport and communication in the entire zone of the North-West, where their only concurrence was the ox.⁷⁹

Oxen

The Indian ox (*Bos indicus*), or hump-backed ox,⁸⁰ which plays an essential role in the emotional, social and religious life of the Hindus,⁸¹ was the means of transport par excellence in tropical India: used as a mount and pack animal, it served also for draught and was employed to draw almost all the carts.⁸²

79. As Modave wrote (*Voyage*, 328): 'The employment of these animals is in a way absolutely necessary in Indoustan, where there are few or no mules. The nobles, military men, wealthy merchants and other travellers make use of camels to transport their baggage. Above all, the armies trail them along with them in prodigious numbers. I do not think that there would be less than 100,000 camels in the four cities of Fezabad, Laknau, Delhi and Agra. I recollect having seen them appear by the hundreds in the fields along the route leading to the two imperial cities'.

80. The Indian ox, which has an adipose hump between the shoulder blades, is called *zebu* by zoologists, a term quite unknown in India (vide, regarding this subject, *Hobson-Jobson*, 979).

81. The cow remains in India the sacred animal par excellence. Rituals utilize as purificatory agents the *pañcagavya*, the five products of this animal: milk, curd, butter, urine, dung. A number of legends are associated with *goloka*, the 'cow world' which designates one of the Brahmanic heavens. The metaphors in the classic texts formed of the name of the cow and the operations in which the cow is instrumental, notably regarding the milking, are very numerous (Renou, in *Inde Classique*, t. I, 535). In the sphere of everyday life, the attention given the cow is reflected in the vocabulary, which distinguishes precisely the specific attributes (favourable markings, coat, eyes, horns, hump, members, hooves), as well as in the protection which it enjoys (injunction against its killing) and in the role which it plays in certain religious festivals, such as *māṭṭupōṅkal* (boiling (of rice) for cattle) in Tamil country, at which time the animals receive garlands of greenery and flowers (vide *Ā'in*, vol. I, 157; Linschoten, *Voyage*, vol. I, 257, 300; Bernier, *Travels*, 326; Thévenot, *Travels*, 91; Kipling, *Beast*, 114-35; W.D. Gunn, *Cattle of Southern India*, 47-8). A noble animal, it could upon occasion be used by the emperor himself. Thomas Roe (*Embassy*, 426) recounts that one day Jahāngīr went for a stroll with his beloved, Nūrhān, in a covered vehicle drawn by oxen. The president of the English trading establishment in Surat dispatched an Indian cart harnessed with two white oxen to receive the German aristocrat Mandelslo (*Mandelslo, Travels*, ed. Commissariat, 14).

82. 'This animal fulfills all the functions intended for horses and mules in other countries. It draws carriages; it serves as mount; it is charged with travel gear and bundles; it transports grain from one province to another; it works the earth which is ploughed; it threshes grain by trampling upon it; it does not quit a chore to which it has been submitted' (Perrin, *Voyage*, vol. I, 101).

Breeds

Because its domestication is ancient,⁸³ local differentiation has resulted in numerous varieties, ranging from the animal of small stature, slender and light, to the large ox, long-legged, boney and very muscular.⁸⁴ It remains unknown to which extent the Indians have been concerned with the improvement of the existing breeds through intentional cross-breeding. Akbar seems to have taken interest in doing so. Abū'l-Faẓl⁸⁵ mentions that the Mughal sovereign was aware of the problem, and that the animals were grouped according to categories in the imperial stables and attended to by a qualified staff. However, it was the sovereigns of Maisūru who, during the seventeenth and eighteenth centuries, made the most sustained efforts in this respect. A thorough selectioning of the best local animals and judicious cross-breeding enabled them to produce the hardy breed of *amṛta mahāl*⁸⁶ which subsequently contributed to the exploits of Ḥaidar 'Alī and of Tipū Sultān.⁸⁷

83. Excavations made in the Indus Valley have unearthed skeletons dating from the 3rd millennium. It was a domestic animal in the Harappan period (Piggott, *Prehistoric India*, 121, 155).

84. 'These oxen are of different sizes and very hardy, so that some of them will travel 15 leagues a day. There is one kind of them, almost 6 foot high, but they are rare; and on the contrary another which they call dwarfs, because they are not 3 foot high; these have a bunch on their backs as the rest have, go very fast and have to draw waggons' (Thévenot, *Travels*, 73). Vide also *Ā'in*, vol. I, 157-8; Finch, in *E.T.*, 18; Terry, in *E.T.*, 297-8, 311; Kipling, *Beast*, 131.

85. *Ā'in*, vol. I, 157-60. Watt (*Commercial Products*, 735) is not convinced by the chronicler's arguments; he judges that his description 'reads more like a proclamation of the pageant of the all-wise and good emperor than a statement of his efforts towards the improvement of the cattle in India'.

86. It was in fact the *rājā* of Maisūru, in particular Cikka Dēvarāja Odeyar (1672-1704), who created a special department charged with the improvement of the cattle, and supervised the process of selection in the royal stables. When Ḥaidar 'Alī usurped the throne, he appropriated the enormous herds of the *rājā* and other dignitaries so as to use them in his army (he was reputed by tradition to have had 60,000 oxen). His son, Tipū, reorganised the administrative department of the *rājā* and gave it the pompous name '*amṛta mahāl*' (*amṛta*, nectar, milk). He established an entire reglementation which was adopted by the English subsequent to the capture of Śrīraṅgaṇa: the '*āmildār*' were responsible for the training of the young animals which were then classed in different categories according to their aptitudes with plough, cart or as pack animals. Each year the sovereign had the animals pass in review (W.D. Gunn, *Cattle of Southern India*, 8-10).

87. It was due to these oxen that Ḥaidar 'Alī, after having suffered a bitter defeat, could make a 162 km march in two days and was able to take with him his cannons, and it was also because of them that Tipū Sultān succeeded in traversing the entire south of the peninsula in one month to re-capture Bedanūru (*ibid.*, 10-19).

From region to region the quality, the requirements and efficiency of the oxen differ significantly. Only mediocre animals are raised in the abundantly watered regions, the deltaic plains corresponding to rice-growing country, where the pastures are inadequate and selectioning not practised, as on the western coast, Baṅgāl or Āsām. Conversely, in those zones of weak rainfall, good work breeds are raised whose aptitudes for draught and portorage were recognized at a very early date.⁸⁸ The most esteemed oxen in the South are those originating in Vaṅgōlu (Ongole) or Nellūru, which are strong and able to pull heavy carts, but slow; and, those from Maisūru which are of average size, very hardy and able to make long journeys with moderate loads.⁸⁹ In the North-West, among the Pañjāb varieties, that of Hāmsī is valued for heavy transport. Those from Mālava, solid and tough but not very swift, would have been the preferred pack animals of the *Bañjārā*, who carried on an active commerce with the Deccan.⁹⁰ Animals well adapted to portorage originate on the Kāthiyāvāḍ peninsula; their large hooves, however, are overly sensitive to hard surfaces. Finally, the best oxen in India are those of Gujarāt; able to carry or draw heavy loads, and having a lively and alert gait, they were highly regarded by European travellers and Akbar's chronicler.⁹¹

Those animals intended for transport were often shod.⁹² They received a more substantial nourishment than the others: their meagre ration of fodder was complemented by a mixture of rice, lentils (*dāl*) or

88. Watt, *Commercial Products*, 732-43; Kipling, *Beast*, 114-70; Crooke, *Things Indian*, 90-5; I.G. (1908), vol. III, 76-83; Kumar, *Agriculture*, vol. III, 1-22.

89. Buchanan, *Journey*, vol. I, 142-3, 290; Perrin, *Voyage*, vol. I, 102; Crooke, *op. cit.*, 93.

90. Crooke, *op. cit.*, 95.

91. Vide, inter alia, Forbes, *Oriental Memoirs*, vol. II, 184-5; *Ā'in*, vol. I, 157. The ordinary animals were not expensive. A letter from Bharuc, dated 20 September 1647 (in *E.F.*, 1646-50, 156), stated that they were valued at Rs. 10 and that it was necessary to find a place where they were yet less costly. Perrin (*Voyage*, vol. I, 105) specifies that this common animal was very cheap and that one could 'have a choice ox for 12 francs of our money'. But the ox of good breed or with favourable markings, considered as a sign of prestige, could cost fortunes. Tavernier (*Travels*, vol. I, 37) gave Rs. 600 for the two oxen of his team. According to Thévenot (*Voyage*, 152), the Dutch had purchased white oxen at 200 écus a head. Finally, Akbar was reputed to have paid Rs. 500 for a pair (*Ā'in*, vol. I, 157).

92. Thévenot (*Voyage*, 151; *Travels*, 72-3) describes the procedure thus: 'They cast them with a rope fastened to two of their legs and so soon as they are down, they tie their four feet together, which they put upon an engine made of two sticks in form of an X; and then they take two little thin and light pieces of iron, which they apply to each foot, one piece covering but one half foot, and that they fasten with three nails above an inch long, which are clenched upon the side of the hooves, as horses with us are shod'. Buchanan (*Journey*, vol. I, 143) states that in Maisūru they are shod 'with slight iron shoes'.

peas (*kolllu*), with clarified butter and sugar.⁹³ Especially the draught animals were cared for attentively.⁹⁴

It was common to utilize the ox as a mount, placing a carpet or saddle on its back and guiding it by means of a lead traversing the nasal septum.⁹⁵ And then, above all, it was employed as a pack animal.

*Pack-oxen*⁹⁶ (vide Fig. XXXII, a., b., c.)

An ox generally carries its load in a bag formed of two large pouches, made fast by ropes to a thick carpet or padded cushion, itself affixed by

93. *A'in*, vol. I, 158; Thévenot, *Voyage*, 155; *Travels*, 73. Modave (*Voyage*, 469) judged that the food supplement enabled the pack animals to better endure the fatigue: 'Those oxen in service which are daily provided with grain better support this change (of season), with the help above all of *masālā*. These *masālā* are the secret of the subsistence of the beasts of burden in Hindusthān, as well as of horses and even elephants. It is a mixture of flour, butter, sugar and other ingredients, including sometimes even opium. With these one makes fist-sized balls which are stuffed down the animal's throat until the pills have been swallowed. This serves to sustain them and renew their forces, and is administered to them more or less frequently in proportion to the ardours of the journey'.

94. 'When an ox is intended for the harness, its fate is different from that of its companions. Its fortune is made, and it has nothing to fear in the future. It is lavished with caresses and every attention: it is nourished delicately and groomed with exactitude; not the least stain is tolerated on its coat. Furthermore, it is decorated more or less magnificently according to the role it is to play. The least that one does is to encase each of its horns with brass and to put around its neck a necklace made of polished metal strips. But, if it has been favoured by fate to enter into the stables of a prince, it becomes itself a figure of distinction. The casing of its horns is of massive gold; its necklace is made of the same metal, or of polished silver; its straps are comprised of rich fabrics. There remains nothing for it to desire beyond the sentiment of its dignity' (Perrin, *Voyage*, 103). Vide also Thévenot, *Voyage*, 152; *Travels*, 73; Fryer, *New Account*, vol. I, 296.

95. 'Seeing the oxen in the Indies are very tame, many people make use of them in travelling, and ride them like horses; though commonly they go but at a very slow pace. Instead of a bit they put one or two small strings through the gristle of the ox's nostrils, and throw over his head a good large rope fastened to these strings, as a bridle which is held up by the bunch he hath on the fore part of his back, that our oxen have not. They saddle him as they do a horse and if he be but a little spurred, he'll go very fast; and there are some that will go as fast as a good horse' (Thévenot, *Voyage*, 151; *Travels*, 73). Ovington (*Voyage*, 151) and Perrin (*Voyage*, 104) make the same observation. The sketch of a mounted ox is to be found in Mundy's account (*Travels*, vol. II, 192, pl. 12, D).

96. Pack oxen are but rarely represented in ancient art. However, convoys of oxen laden with bags are sculpted in the friezes of the Kōṇārak temple (reprod. in Ganguly, *Konarak*, photographs 67-8). Mughal miniatures sometimes portray these animals in scenes depicting daily life, as for example the painting which recounts of the construction of Fatehpur Sikrī, where oxen are to be seen transporting sand (*Akbar-nāmah* in the Victoria and Albert Museum, London, reprod. in Verma, *Art and Material Culture*, pl. LXXVII). The degree of interest in this

means of a strap about the stomach and a crupper.⁹⁷ The weight of the load it must carry varies from region to region in relation to its stamina. On the Maisūru plateau, the best of the animals were employed to convey bales of cotton weighing from 148 to 185 kilos over a daily distance of 19 km.⁹⁸ Spices, pepper, betel, etc., were consigned to these animals of lesser quality, distributed in bags weighing 93 kilos.⁹⁹ Finally, for the transport of grains, the most ordinary oxen (or donkeys) were utilized, which could carry lighter loads (from 54 to 72 kilos) at a slow and irregular pace. Merchants did not risk entrusting them with valuable merchandise, being apprehensive that the prices might in the meantime change and thus their advantage be forfeited.¹⁰⁰ On the Gangetic Plain, in Bihār, the animals used for transport usually covered 19 km while carrying some 113 kilos on their backs.¹⁰¹ From Mumbāi to Pune, on the difficult tracks of the Ghāṭs, their load was limited to 73 kilos.¹⁰² The British army in India selected only those animals able to

mode of transport is reflected linguistically in the abundance of names which denote the packs, bags and baskets affixed on the backs of animals. Grierson (*Bihar Peasant Life*, 24-5) made note of this vocabulary in Bihār, where it varies from region to region.

97. As is shown in a print by Solvyns depicting a *laddū bail* (pack ox) (in *Les Hindous*, t. III, s.v. *ladoubyl*) and in a drawing by G. Chinnery (circa 1810-22) treating of the same subject (reproduced in Archer, *British Drawings*, vol. II, pl. 72). Grierson (*op. cit.*, 24) specifies that in Bihār one utilized a large cushion stuffed with straw and covered by a leather piece. This thick carpet was adequate when well-balanced bags of salt or grains were placed upon it; however, for the transport of hard objects, there was a pack-saddle consisting of a wooden framework with padded strips, which is still to be seen in certain isolated regions of Orīṣā (vide *Census 1961, Village Monographs*, vol. XII, part VI, N. 4, photograph of a pack ox).

98. A load of 12 to 15 *man*, or of 327½ to 409 lbs (Buchanan, *Journey*, vol. I, 142). According to Tavernier (*Travels*, vol. I, 32), the celebrated oxen of Gujārāt carried from 300 to 350 lbs (140 to 170 kilos).

99. A load of 8 *man* on the average, or 206 lbs (Buchanan, *op. cit.*, vol. I, 143). At Śīrā, the average load for oxen was about the same: 8 *man*, or 213 lbs (*ibid.*, 290); that of pack animals traversing the Ghāṭs was also 8 *man*, or 194 lbs, or 88 kilos (*ibid.*, 416).

100. Buchanan, *Journey*, vol. I, 143. The same distinction was made among oxen in Kāraikkāl at the beginning of the nineteenth century: 'The load of a pack ox is fixed at 4 gallons and 6 markals of nelly (158 kilos). There are none in our aldeas able to carry such a load. In our area there are those which carry 3 gallons (105 kilos), or others, 2 g. 6 m. (88 kilos), some again carry 2 g. (70 kilos), and the weakest, ½ g. 6 m. (53 kilos). The average term of these 4 different weights is 2 g. 3 m. (80 kilos). The pack ox which is not employed for ploughing carries 3 g. (105 kilos) of nelly' (Cordier, *Historique*, 121).

101. Buchanan, in Martin, *Eastern India*, vol. I, 387, 559; vol. III, 269.

102. Seely, *Ellora*, 37. On the west coast, south of Govā, the pedlars loaded

transport 95 kilos.¹⁰³ When all is considered, the average load of oxen of good breed can be roughly estimated at 150 to 170 kilos, while that of animals of a more ordinary variety at 80 to 100, and that of common oxen at 50 to 70 kilos.

Buffaloes

The buffalo (*Bos bubalus*), having been domesticated at the same time as the ox,¹⁰⁴ is better suited than the latter to zones of heavy rainfall or regions where work is done in water.¹⁰⁵ It adapts itself very well to pack and draught, and can even bear heavier loads and draw heavier carts than an ox of equal size. Nevertheless, the buffalo has played a negligible role in long-distance transport, because it does not tolerate well the heat and has need of frequent baths. It was usually employed to carry water.¹⁰⁶ Sometimes it was harnessed to a cart over shorter distances.¹⁰⁷ In some regions it served as a pack animal: the large buffaloes employed by the cloth merchants of Beṅgalūru could cover from 19 to 24 km a day with an average load of 185 kilos;¹⁰⁸ those of Śīrā carried 145 kilos over a distance of only 14 km.¹⁰⁹

Thus the ox was by far the animal most used for transport in tropical India, followed by the dromedary which assumed an equivalent role in the arid region. The latter has retained its function in desert areas; but the ox, which is still harnessed to the cart in rural areas and remains the main draught animal, is practically no longer employed as beast of burden. It is therefore appropriate to recollect how this mode of transport was organised.

their oxen with only modest packs of 3 or 4 *man* (at 28 lbs each, about 37 to 50 kilos) (*Bombay Gazetteer*, vol. XV, *Kanara*, part I, 80.)

103. Humbley, *Journal of a Cavalry Officer*, 25-6.

104. It was a domesticated animal in Harappā (Piggott, *Prehistoric India*, 156). *The Laws of Manu* (book XI, 69) mention it often. Among the *Todava* (Todas) of the Nilagiri (Nilgiris) it plays today an important role in religious ceremonies (*M.G.*, 904-5).

105. The best species are, however, found in the areas of average water fall in western India (Watt, *Commercial Products*, 735-6; *I.G.* (1908), vol. III, 81-3; Kumar, *Agriculture*, vol. III, 9-10).

106. It was the main labour of the buffaloes in Akbar's imperial stables (*Ā'in*, vol. I, 158). Vide also Ovington, *Voyage*, 151; Fryer, *New Account*, vol. I, 295.

107. Buchanan, *Journey*, vol. I, 2; Ovington, *Voyage*, 151.

108. A load of 15 *man*, or 410 lbs (Buchanan, *Journey*, vol. I, 143).

109. A load of 12 *man*, or 320 lbs (*ibid.*, 290). Kosambi (*Culture and Civilisation*, f.p. 133, fig. 4) gives a photograph of a buffalo with pack saddle bearing provisions and material to the Nāne pass, west of Junnar in Mahārāṣṭra.

b. ORGANIZATION OF TRANSPORT BY MEANS OF PACK ANIMALS

The rhythm of economic life was linked with the slow pace of these animal porters. In 1800 in Maisūru, the transport of merchandise was effectuated almost exclusively by means of pack-oxen.¹¹⁰ The situation was similar on the eastern coast,¹¹¹ as well as in Bihār and Central India.¹¹² The peasants in the countryside used their animals to go to fairs or the local markets; during the off-season, they used them to convey their harvest to the neighbouring cities,¹¹³ or to undertake small commercial transactions.¹¹⁴ At Buchanan's time, some kannāḍa communities were specialized in animal portage. Thus, in Beṅgalūru among the *baṇajigāru* merchants, there were many who raised oxen which were for hire. The cost of transport was calculated on the basis of an average load of eight *man*, or 93 kilos, and the distance covered, but never according to the duration of the journey. It was furthermore understood that the goods were expedited at the risk of the sender, who had to dispatch a reliable person to accompany the consignment.¹¹⁵ Just as in eastern India tradesmen such as the *baldiyā* or *laddū bepārī*, conducted commerce with their own pack animals, which they occasionally hired out when these were not occupied.¹¹⁶ There prevailed in this respect no uniformity. These movements, which corresponded to the needs of an essentially rural population and the quite limited relations among provinces, were complemented by the circulation of professional transporters who played a major role in inter-regional communications: the *Baṇjārā*.

Baṇjārā

Known by different names from region to region (*Baṇjārā*, *Birīnjārī*,

110. Buchanan (*Journey*, vols. I and II), at the time of his journey across the plateau, nowhere mentions having seen goods being transported in another manner. Heyne (*Tracts*, 82) specifies that all goods were conveyed on the backs of oxen.

111. Place's *Report on the State of the Jaghir*, dated 6 June 1799 (*Tamilnāḍu Archives*, ms. No. 18858-493, 287-8).

112. Buchanan, in Martin, *Eastern India*, vol. I, 387, 557; vol. III, 269; Colebrooke, 'Narrative of a Journey from Mirzapur to Nagpur', *Asiatic Annual Register for the Year 1806*, Misc. Tracts, 34-5, 38.

113. Letter from Munro to the Board of Revenue, dated 11 January 1805 (cited in Sarada Raju, *Economic Conditions*, 188).

114. Buchanan, in Martin, *Eastern India*, vol. II, 1017.

115. Buchanan, *Journey*, vol. I, 143. In Dāvāṅgere, some *śivabhakta*, Muslims and Marathas provided for transport under similar conditions (*ibid.*, vol. II, 432).

116. Buchanan, in Martin, *Eastern India*, vol. I, 379 (Bihār); vol. II, 288 (Bhāgalpur); vol. II, 569 (Gorakhpur); vol. II, 1017 (Dinājpur). Concerning the different communities of merchants in South India, vide Sarada Raju, *Economic*

Lambāḍi, Lambānī),¹¹⁷ they constituted local and regional groups¹¹⁸ of itinerant cattle breeders who earned their living by transporting goods from one region to another. Each group, led by a hereditary or elected chief, called *nāyaka* in the Deccan,¹¹⁹ formed a *ṭāṇḍā* (camp or caravan), the importance of which corresponded to the size of the herd possessed: ranging from several hundred to several thousand.¹²⁰

Role

Above all the role they assumed in the provision of armies is known, for they are incidentally mentioned since the fifteenth century in the accounts of military campaigns. In 1417, at the time of a rebellion in the *Bahmanī* kingdom, the chronicler mentions the interception of one of their convoys coming from Barār.¹²¹ In 1505, during Sikandar Lodi's campaign against Dholpur, they were in the sovereign's service.¹²² When the *vazīr* of Šāhjahān invaded the Deccan in 1630, he had with him two groups of *Baṇjārā*, the first consisting of 52,000 and the second

Conditions, 186-90.

117. Regarding etymological points, vide Wilson, *Glossary*, 60, 308, and *Hobson-Jobson*, 114-5, 502. Even though these transporters are mentioned only as of the Muslim period, it cannot be said that they came to India with the invaders from western Asia. On the contrary, when their traditions are considered, and the inviolable freedom which they enjoyed in this country as well as the almost religious respect which they inspired, it can with all probability be supposed that they are of Indian origin. Specialists think that they issued from the *Cāraṇ* or *Bhāt* caste, bards and transporters from Rājputānā, and that subsequent to the establishment of the Muslim dynasties they offered their services to the various emperors and merged with other transporters, Hindu and Muslim, to constitute a new group, or rather local and regional groups of a professional caste (?). As pertains to their origin, traditions and life, vide Crooke, *Tribes*, vol. I, 149-67; Nanjundayya, *Tribes*, vol. II, 137-97; Thurston, *Castes*, vol. IV, 207-32; Russell, *Tribes*, vol. II, 162 sq.

118. According to Tavernier (*Travels*, vol. I, 34), they comprised four groups specialized in the transport of wheat, rice, vegetables and salt. Nanjundayya (*Tribes*, vol. II, 150) describing the internal structure of this caste, states that it was divided into three principal groups.

119. Heyne, *Tracts*, 83; Briggs, *Account of Origin, History and Manners... of Bunjara*, cited by Nanjundayya, *op. cit.*, 175.

120. Between Govā and the Deccan plateau, these caravans consisted 'usually of five to six hundred oxen, the greater number of which carry the goods and provisions. The others serve as mounts for the drivers' women and children' (Anquetil Duperron, *Zend*, t. I, I, CCXXII). According to Briggs (*op. cit.*, in Nanjundayya, *Tribes*, vol. I, 175), each member of the community possessed from 4 to 200 oxen and a *ṭāṇḍā* could easily number 30,000 oxen.

121. Briggs, *History of the Rise of the Mahomedan Power*, vol. II, 243.

122. Elliot, *History of India*, vol. V, 100.

of 180,000 oxen.¹²³ Finally, Jahāngīr specifies in his memoirs¹²⁴ that between Multān and Qandahār they followed the army with some 100,000 animals.

Their name recurs then repeatedly in the accounts of military operations. They not only provided fresh supplies to the imperial armies, but also to the Maratha camps, the troops of Tipū Sultān and the European soldiers. The English generals make frequent allusion to them in their reports.¹²⁵ Without their support, it would have been impossible to feed the soldiers on campaign. No large-scale military operation could have been undertaken without the aid of the *Banjārā*: during the Mughal period, they represented a veritable institution.

If they assumed during war time the role of suppliers to armies, it is because they were, prior to the establishment of the railways, the only transporters capable of conveying over long distances and in large quantities the basic foodstuffs (grain, salt, sugar) from the zones of production to centres of consumption. This aspect of their activity is not well known, because the foreign observers of the period were above all susceptible to the picturesqueness of their life; and, then again, the goods with which they were charged were destined principally for consumption and were thus not recorded in any ledger; finally, because their enormous caravans eventually disappeared from the Indian countryside and, with them, the memory of the transactions they effectuated.

Nevertheless, throughout the country, particularly in those regions in which communications were difficult, as in the jungle of Central India, the terrain of the Ghāts or the Deccan Plateau, they assured the transport of indispensable products among different and sometimes complementary economic regions. Usually, they conveyed the salt from the coast to the interior of the country, whence they returned with grains; but, often they loaded themselves with more diversified products, foodstuffs and manufactured items.¹²⁶ Forbes¹²⁷ states that from the plateau to the western littoral, they transported grains, oil, cotton cloth and silk; returning mainly with salt and also raw cotton, spices, iron, copper and imported articles. Buchanan¹²⁸ specifies that in

123. *Berar Gazetteer*, cited by Crooke (*Tribes*, vol. I, 151) and by Nanjundayya (*Tribes*, vol. II, 139).

124. *Tūzūk*, vol. II, 233.

125. Vide Wilks, *Historical Sketches*, vol. II, 236-7; Moor, *Narrative*, 131-2. Briggs (*op. cit.*, in Nanjundayya, *Tribes*, vol. II, 141) relates that in 1798, at the time of the campaign against Tipū, the English representative advanced them Rs. 150,000 to search for the grains necessary for the subsistence of the British troops who besieged Srīraṅgapattana. Even though the city had been taken prior to their arrival, the English general accepted the entire consignment.

126. Heyne, *Tracts*, 82; F. Martin, *Mémoires*, t. II, 265.

127. Forbes, *Oriental Memoirs*, vol. II, 276-7.

128. Buchanan, *Journey*, vol. I, 419.

Maisūru at the time of Haidar 'Alī, the *Lambādi* had obtained from the *sultān* the monopoly of all commerce which took place between the coast and the Ghāts, save for cloth, tobacco and clarified butter.

One of the most characteristic features of these groups was the immunity which they enjoyed throughout India, even in time of war.¹²⁹ Until the close of the eighteenth century, the *Bañjārā* could circulate freely through different regions of the subcontinent, without anyone daring to impede their movements. Their person and property were respected by all political authorities; and, if they should at certain borders be obliged to pay the normal passage rights, at many others they passed freely. They were considered as neutrals in zones of combat and provided supplies without discrimination to the one or the other camp. Even should the goods destined for one army have been seized by the soldiers of the enemy camp, they were paid normally without any further complication having troubled the transaction. It was only at the end of the Mughal empire, when they had begun to indulge in pillage, then in criminal acts, that they forfeited their privileges.

Tāṇḍā on the March

Veritable nomads,¹³⁰ they were continually underway during the fair-weather season.¹³¹ Each day they travelled on with their oxen,¹³² which

129. This astonishing privilege explains that one could have made a connection between the *Cāraṇ* or *Bhāt* of Rājputānā and the *Bañjārā*. As Tod states (*Annals*, 1884 edition, vol. II, 674) 'It was the sanctity of their office which converted our bardais into bunjarris, for their persons being sacred, the immunity extended likewise to their goods and saved them from all imposts'.

130. 'These people take an entire family along with them; the women give birth along the way and suckle their children who are born, live and die, as it were, as wayfarers' (Anquetil Duperron, *Zend*, t. I, I, CCXXII). Today they are settled almost everywhere.

131. These people, continuously on the move in often inhospitable regions, were very superstitious and practised quite commonly human sacrifice before undertaking their long wanderings. They would kidnap a child and it would be interred up to the shoulders, after which they drove their oxen over the unfortunate victim, in the belief that this act would favour their expedition. On the way, they were of the habit to attach a piece of cloth or small bells to certain bushes, which had religious import, but served as well as milestones. In other places they erected piles of stones in honour of the goddess, these also representing points of reference (Cumberledge, *Some Account of the Bunjarrah Class*, 18-20; Abbé Dubois, *Hindu Manners*, 70; Moor, *Narrative*, 212; J. Cain, 'The Bhadrachalam and Rekapalli Taluqas', *Indian Antiquary*, vol. VIII, 1879, 219).

132. According to Forbes (*Oriental Memoirs*, vol. II, 277), they conveyed their goods in two phases: accompanied by women and children, they first took half the goods to a pre-determined point, where they unloaded the animals; leaving their families and the goods under the surveillance of guardians, they returned with the

probably carried light loads of some 60 or 70 kilos.¹³³ They advanced very slowly, for each time they came upon new pastures, the animals were unloaded so that they might graze. Under such conditions, but relatively short daily stages were achieved: some 12 or 15 km.¹³⁴ Nevertheless, marching thus every day they were able to cover several thousand kilometres during the months preceding the monsoon season.¹³⁵

At the close of the last century, some *tāṇḍā* were still active in certain regions of difficult accessibility. South of Govā were the *Lam-bāṇi*, who went back and forth between the coast and the plateau, remaining at the summit of the Ghāṭs during the monsoon period in

oxen to the point of departure to take the second half of the consignment, which was also transported to the stopping place. There the animals took rest, then set out on the second stage, as before with half the goods, returning in the same way to take the second half. This binary rhythm with the break mid-way enabled the whole of the community to reconcile at one time the exigencies of transport with those of family life. In the evenings they stopped near a water point (well or river), unloaded the animals and stacking the bags of grain or salt in such a fashion as to form a kind of rectangular wall upon which they put cloth (protection against eventual rain), they tethered with rope their animals, the heads directed outwards, to form a circle which neither man nor animal could approach because of the dogs which remained outside. In the camp the families again gathered, the women setting about to cook and attend to the children. In the evening, when all had been prepared for the coming day, they slept, not to awaken until the time of departure. (Vide also Broughton, *Letters*, 41-2; Bevan, *Thirty Years in India*, 252-3.)

133. In *E.F.* (1655-60, 63), loads of saltpeter are mentioned weighing $4\frac{1}{2}$ *man* (*śāhjahānī*), or 140 kilos, and Marshall (*Notes*, 425) speaks of 4 *man*, or 133 kilos; but, this refers to local transporters, and not to the *Baṇjārā*. Mundy (*Travels*, vol. II, 98), however, estimated that their oxen carried bags of sugar weighing $2\frac{1}{2}$ hundred-weights, or 127 kilos, and sacks of rice at 4 large *man* (*jahāngīrī*), or 120 kilos. It is possible that some *tāṇḍā*, specialized in the conveyance of manufactured products, had used good varieties of oxen capable of bearing such loads; however, it seems that the majority of the wheat or salt caravans, uncertain whether as to find adequate pastures along the way, had employed the most common and least costly breed of oxen which, as has been mentioned *supra*, 245, could tolerate only moderate loads of 50 to 70 kilos. The calculations which might be taken as reference regarding the tonnage of goods transported by these pack animals vary in relation to this basic figure: Moreland (*India at the death of Akbar*, 227), relying on the figures provided by Tavernier (300 to 350 lbs), estimates that a caravan consisting of 10,000 oxen transported at least 1,500 tons; we think that it would be more realistic to say that usually a *tāṇḍā* could convey but half that amount.

134. Mundy (*Travels*, vol. II, 96) estimated that they covered no more than 6 or 7 miles a day, and that during the cool season. The rate of their movements evidently depended upon the local conditions, but it does not appear to have exceeded a dozen miles (16 km) (Crooke, *Things Indian*, 71).

135. 700 or 800 leagues, according to François Martin (*Mémoires*, t. II, 265); 1,500 or 2,000 miles according to Forbes (*Oriental Memoirs*, vol. II, 277).

bamboo huts which they constructed near villages or in the proximity of pastures.¹³⁶ Those *Bañjārā* who conveyed salt from the eastern coast to Chattīsgarh followed tortuous trails traversing mountains and forests, fatal to sick animals and, as they never bothered to take fodder with them, entire herds could famish in case of drought. They set out from the saltworks of Gañjām and Kāñgapattānamu in April, and either by way of Bauddh and Sambalpur, or of Bisāmkattak, arrived in the Raypur region at the end of June, where they sold their salt cargo and led their oxen to pasture in the jungle, leaving them there until the rains subsided; then, between December and February they returned to the coast.¹³⁷

This demonstrates the importance of oxen as pack animals in the transport of goods over long distances. The English trader, Peter Mundy, who encountered on the route between Āgrā and Ilāhābād at the beginning of the seventeenth century a caravan consisting of 14,000 oxen loaded with wheat and rice, and another *tāndā* of 20,000 animals bearing sugar between Siroñj and Āgrā, noted his impression of these movements in his diary:

Sitting on the topp of a little Hill we saw a baniare (caravan) and many thousand of oxen laden with provision. It was at least 1½ mile in length and as many more returning emtie to be reladen, and all the face of the earth as farr and distant as we could discern, covered with green Corn.¹³⁸

As a means of circulation, these long convoys transporting in great quantities indispensable produce played a role analogous to that of today's railway, excepting that they travelled at a slower pace.

Camel Caravans

Conjointly with oxen, camels were utilized in the arid strip of tropical India which extends in the form of a crescent to the west of Goñdvānā, roughly from Banāras to Haidarābād. Throughout this region camels could be hired from breeders and from merchants in the majority of the large towns.¹³⁹ In steppes and deserts of the arid region, where the

136. *Bombay Gazetteer*, vol. XV, *Kanara*, part I, 338.

137. *M.D.M.*, *Ganjam*, 232. A complete study remains to be made concerning the salt routes followed since very earliest times, particularly in Central India, which does not lack in settlements named *Bañjārā*; however, these local investigations should not be postponed, for the generations retaining a memory thereof will have soon disappeared.

138. Mundy, *Travels*, vol. II, 56.

139. Modave (*Voyage*, 470, 483) hired them at Savāi Mādhopur (in the east of Rājasthān) in 1776; at Koṭā, which was then a large camel market, he purchased seven to make his way to Haidarābād. Jacquemont (*Découverte de l'Inde éternelle*, 54-5), travelling up the Gangetic Valley, wrote in November 1829: 'In Banaras I

dromedary is the best pack animal, portorage was effectuated in one of two ways, depending upon whether or not it was related to the pastoral life and its migrations.

On those tracks which lay outside the great movements of transhumance, such as the route from Aṭak to Kābul or the north-south axis along the Indus, the goods were transported by regular caravans according to fixed itineraries by animals belonging to the traders themselves or to specialised transporters from the cities.¹⁴⁰ But elsewhere, especially between the mid-valley of the Indus and the Afghān mountains, there existed a little known traffic, conducted by semi-nomadic shepherds, which to a certain measure corresponded to that of the *Baṇjārā* on the remainder of the subcontinent.

The Role of the Pastoral Tribes of the North-West

These dromedary breeders combined their annual migrations with the transport of goods. Those who had a small capital invested their money in certain products which they then directly sold themselves; others hired out their camels to wealthy traders, who had either to accompany their cargo or have it watched over by their agents. In any case, for reasons of security, the pack animals always travelled with the tribe to which they belonged.¹⁴¹ Some knowledge is available concerning the *Loḥānī*,¹⁴² who followed in their movements the Gomal Valley. Bābur

hired camels to go to Delhi.... One says that the camels are admirable; they are hired out for nine rupees (25 francs) per month, and seven rupees when one takes more than three. One need not occupy oneself either with their food, or that of their drivers.... But, on this first part of the route (from Kalikātā to Banāras) there are no camels at all.... From Delhi to the foot of the mountains, passing through part of Sikh territory, I shall continue with the camels'.

140. They bred many on the uncultivated lands around the cities (Elphinstone, *Cambul*, 291, 293). A study made in 1852 in three towns in Sindh shows that in the course of that year Karācī merchants numbering 28 dispatched goods having a value of Rs. 927,950 in the saddle-packs of 7,406 camels and 25 *ṭaṭṭū*; that 9 tradesmen from Śikārpur dispatched merchandise at a value of Rs. 508,800 on 1,696 dromedaries; and finally, that 11 merchants from Ṭaṭṭā loaded 1,600 camels and 430 *ṭaṭṭū* with products valuing Rs. 281,000. Taking an average of these figures, it is seen that the Karācī merchants utilized 264 camels each, those of Śikārpur 188 and those of Ṭaṭṭā 148, with some 40 *ṭaṭṭū* (based upon information collected by W. Chapman, in Andrew, *The Scinde Railway*, 96-7).

141. Elphinstone, *op. cit.*, 290.

142. A generic term designating several groups. According to Burnes (*Cabool*, 177), the *Loḥānī* were comprised of the *Mīan Khail*, the *Nāsar* and the *Kharotī*. According to Elphinstone (*op. cit.*, 368), this term included a greater number of tribes, amongst which the *Bābar*. Vide H.A. Rose, *Glossary*, vol. I, 495; vol. II, 101, 162-3.

states in his memoirs¹⁴³ that he encountered them in 1505, and Burnes¹⁴⁴ observed their activities at the beginning of the nineteenth century.

They remained during the winter in the plains and set out for the mountains at the end of April.¹⁴⁵ Advancing through very inhospitable regions at a daily rate of 13 to 16 km, they were obliged to provision themselves with supplies and water and to take very strict security measures in those zones inhabited by hostile tribes.¹⁴⁶ They would reach Kābul or Qandahār towards mid-June, just in time to expedite goods to Herāt or Bukhārā. Then, the caravan dispersed and the camels were led out to pasture. At the end of October, the different groups returned to the plains with products from Afghānistān and Central Asia.¹⁴⁷ They thus played a major role in the commercial transactions effectuated between the Indus Valley and the 'North-West Frontier'.¹⁴⁸

Camels and oxen were therefore the principal pack animals on the Indian subcontinent, with the exception of the Himālaya, where ponies and mules were utilized. Together with human porters, they assumed a predominant function in human inter-relation; and vehicular transport would appear in comparison to have been more limited.

143. He mentions in fact (*Bābur-nāma*, 235) having pillaged the *Lohānī* traders and recuperated a large quantity of cloth, aromatic unguents, sugar and numerous horses.

144. The nature of their commerce had not changed at the time of Burnes' study (*Cabool*, 78-9; *Travels*, vol. II, 415-6).

145. The manner in which they travelled varied according to the different group customs. Thus, the *Mian Khail* for example, led by their chief, moved with all their families, and all strangers joining up with them were obliged to strictly follow their customs. In comparison, among the *Bābar*, the greater part of the caravan was composed of those not belonging to the tribe. They themselves journeyed as simple merchants without their families, and the leader's authority extended only to clan members, and others were not obliged to obey him. Generally, however, they elected him *qāfilah bāshī* (leader of the caravan), which permitted him to sovereignly direct the march (Elphinstone, *op. cit.*, 290-2).

146. *Ibid.*, 292-3.

147. Burnes (*Cabool*, 78) states that in 1836, according to the customs register of Dāraban, 5,140 camels loaded with goods passed, not counting those carrying baggage, tents, etc., the number of which increased to 24,000 (17,000 for the *Nāsar*, 4,000 for the *Mian Khail* and 3,000 for the *Kharotī*).

148. It is possible that the significance of these tribes regarding the transport of goods had increased with the decline of the Mughal empire, after which the royal highway from Dehli to Kābul via Lāhaur and the Khaibar Pass had been practically abandoned by large-scale commerce because of the prevailing insecurity and the exactions of the local authorities. In any case, it is certain that even during normal times camels and pastoral tribes must have comprised a not insignificant part of this traffic.

3. Wheeled Transport: Ox-Carts

The use of wheeled vehicles in western Asia and India would appear to be very ancient, for documents dating from the Mesopotamian and Harappan civilizations testify to this effect.¹ However, whereas this mode of transport has through the ages almost disappeared in the Near East to the advantage of the camel, the pack animal best adapted to traversal of the vast arid regions,² it has not had the same fate in India, where it has always co-existed with human or animal portage. This was a major source of astonishment for travellers arriving in India by way of Persia.³

Buddhist literature frequently makes mention of merchants who transported their goods by means of vehicles; it is related, for example, that a wealthy brahmin used five hundred ox-carts to transport his commercial products.⁴ Ancient Tamil texts also make reference thereto, and one reads of twenty thousand carts laden with merchandise of all sorts coming from the North, and of thousands of carts utilized by the armies.⁵ Many inscriptions mention the tolls to be paid by waggons in various regions.⁶ Finally, archaeological finds offer several

1. Vide G. Conteneau, 'Mésopotamie et pays voisins', in Daumas, *Histoire générale des techniques*, t. I, 133-4; Marshall, *Mohenjo-Daro*, vol. I, 28; vol. II, 554; Mackay, *Chanhu Daro*, 162-4; Vats, *Harappa*, vol. I, 99.

2. 'The wheeled vehicle could not contend with the concurrence of the camel, the introduction of which into the road economy brought about a radical change in the modality of transport. The Orient, between 400 and 1300, was dependent upon the camel...' (G. Wiet, 'Le monde musulman', in Daumas, *Histoire générale des techniques*, t. I, 353-4).

3. 'Contrary to whatever we found in any place of Persia, where are neither carts, coaches, with caphales of oxen, camels and buffaloes with heavy waggons drawn by teams of oxen... bringing and carrying goods of all sorts' (Fryer, *New Account*, vol. III, 156).

4. *Mahā Sutasoma Jātaka*, vol. V, 71, cited by Srivastava (*Trade*, 24).

5. *Cilappatikāram*, XXVI, 125-40; R. Dikshitar, *Studies in Tamil Literature and History*, 239. Carts are mentioned in the *PuRanāNūru* (116, 18) which, laden with salt, travelled from the coast to the interior of the country in caravans (reference communicated by N. Subrahmanian). According to the *Paripāṭal* (XX, 14-17, transl. F. Gros, 126), the Tamil pilgrims who journeyed to bathe in the Vaigai used, among other means, wheeled conveyances: 'Awakened from their sleep, arising to the sound of the water flowing along the high ramparts, they harnessed horses from the heavy waggons to the coaches; they drew the heavy waggons with oxen from the coaches...'.⁷

6. Regarding Telugu country, vide *South Indian Inscriptions*, vol. IV, No. 637; *Telingana Inscriptions*, part I, No. 22, utilized by Vaidehi Krishnamoorthy (*Social*

pictorial representations of these vehicles.⁷

Scholars have hastily drawn the conclusion, that wheeled conveyance had been in general practice throughout the country since antiquity.⁸ The information which is available pertaining to a more recent period does not, however, confirm this opinion, and requires us to provide more differentiated judgements.

Expansion of Wheeled Vehicles

In fact, cartage was not practised in a good number of regions whose terrain was little favourable to the wheel; and, even in regions offering natural facilities for traffic, the employment of carts was limited.

This mode of transport was unknown in the Himālayan valleys, isolated by the mountainous foothills; while in Kaśmīr, for example, the harvests were carried on the backs of men, even at the close of the nineteenth century.⁹ Cartage was not to be found along the mountainous western border, nor in Afghānistān, where all transport was effectuated by pack animal.¹⁰

It was equally unknown in the low-lying zones with a hypertrophied water network. In Āsām, around 1853 as Mill travelled through the country, there were no carts.¹¹ In 1859, the commissioner-in-chief of Āsām wrote that since his last visit, carts had been introduced in Koc Bihār and were used to transport the products of the country to the *ghāt* on the rivers, and that he hoped to see the adoption of the same

and *Economic Conditions*, 99). Concerning Tamil country, vide *South Indian Inscriptions*, vol. VI, No. 369; vide also the observations made by Appadorai (in *Economic Conditions*, vol. I, 31, 427) pertaining to the value of epigraphic sources in this domain. The toponymy sometimes bears witness to the employment of carts. Thus, 'Karnūlu' would be derived from *kandena* (Tel.), a mixture of oil and ashes used to grease the cart wheels, and from *prōlu* (Tel.), meaning village. When the neighbouring temple of Alampuramu was being constructed, it was at this place, as tradition would have it, that the carts conveying hewn stones would stop to have the wheels greased (*M.G.*, 426).

7. Vide Motichandra, *Trade*, 232-7.

8. Agrawala (*India as known to Panini*, 149), noting the frequency of allusions to carts in the Buddhist literature, judges this to be an indicium of the growing importance of cartage in the transport of heavy goods. Chakraborti (*Trade*, 84), after having mentioned the information regarding carts as found in Tamil texts, concludes that they must have been utilized throughout South India at the beginning of the Christian era to transport the products of large commerce, as well as to convey people of quality (!).

9. Lawrence, *Valley of Kashmir*, 328.

10. As pertains to the absence of wheeled conveyance in the region of Kvaṭṭā (Quetta) and in Afghānistān, vide J. Postans, 'Report on Upper Scinde', *J.A.S.B.*, vol. XII, part I, 1843, 44; Elphinstone, *Caubul*, 240, 290, 308.

11. Gait, *Assam*, 346.

solution in Āsām. In the interior of the Maymansīṃh district in 1805, the cart was still unknown.¹² In lower Baṅgāl, particularly the region around Ḍhākā, one did very well without them until the close of the eighteenth century. According to a report made by a collector of the district, the first carts appeared there in Ḍhākā in 1790, having been brought by a corps of the British army. Fifty years later, in 1840, only twelve were counted. In the north of the district, where the land lies relatively high and the river branches dry up very rapidly, the merchandise was transported by pack oxen; while in the lower-lying terrain, where all the villages are situated within 5 or 6 km of a navigable river, all traffic was provided by boat.¹³

Nor is it probable that the cart was used to a greater extent in the plain of Orīṣā or on the coastal border of the *Sarkār* (to the north of the Āndhra deltas). The collector of the Viśākhapaṭṭaṇamu district noted in 1849 that there did not exist 'a mile of road in the district along which you can drive a gig or a pig'.¹⁴

The western coast, from Damaṇ to Cape Comorin, separated from the hinterland by the Ghāṭs was no more favourable to the introduction of cartage. Ibn Baṭṭūṭah had already observed this in the fourteenth century, when he went to Kēraja: 'No one travels in this country on a mount, and there are only the sultan's horses. The main vehicle of the inhabitants is the palanquin borne on the shoulders of slaves or hirelings; those who have baggage or chattel, whether packages of merchandise or other things, hire men who carry them on their backs'.¹⁵ Buchanan,¹⁶ emphasizing the importance of human portage in the region at the beginning of the nineteenth century, confirms this observation of the Arabian traveller. Haulage between Kōyamuttūr (Coimbatore) and Ṭṛṣṣivappērūr (Trichur) dates from 1844. When one day twelve bullock-carts laden with merchandise arrived at Ṭṛṣṣivappērūr, where such had not been previously seen by the majority of the

12. *Government of Bengal Papers*, XXXVI, 1859, cited by Guha in *I.E.S.H.R.*, vol. X, I, 1973, 87. I.H.T. Roberdeau, Register to the Zillah Judge of Maymansīṃh, noted in 1805: 'Indeed large roads are not very necessary, for excepting what may belong to gentlemen at the Station, there is not a wheel carriage of any sort, kind or description throughout Mymensingh' ('A Young Civilian in Bengal in 1805', *Bengal Past and Present*, vol. XXIX, Nos. 57-58, 1925, 134).

13. J. Taylor, *Sketch of Dacca*, 120. According to a census made in 1906, the number of rural carts in the Ḍhākā district varied from area to area: 2,758 in the Ṣadr sub-division, 267 in that of Mānikgañj, only 47 in the Nārāyaṅgañj sub-division and nil in that of Munṣigañj (*E.B.D.G.*, *Dacca*, 135).

14. *M.D.G.*, *Vizagapatam*, 1907, 133.

15. *Voyages* (transl. Défréméry), t. IV, 73-4.

16. Buchanan, *Journey*, vol. II, 111. Same observation in Bevan, *Thirty Years in India*, vol. II, 206.

people, there was according to all accounts more excitement than when the first train arrived 58 years later.¹⁷

In the Dakṣiṇa Kannaḍa district (South Canara), vehicles were not utilized in 1838,¹⁸ and in 1851, they were unknown in the district of Ratnāgiri there were not even tracks upon which the pack oxen could circulate, and all goods were conveyed to the markets by bearers.¹⁹

Farther to the north the conditions were no better;²⁰ however, because of the proximity to Mumbai (Bombay), the English administration constructed roads there from the beginning of the nineteenth century, after which the frequency of carts rapidly increased.

Elsewhere, in the region of difficult terrain, such as the Ghāṭs or the heavily wooded regions of Central India, carts could scarcely be employed. If the local *Gazetteer*²¹ is to be believed, there was until 1831 but a single pass accessible to pack animals in the western Ghāṭs of Kārṇāṭaka! In Bastar, covered with forests, the tracks in 1850 were so narrow that two people could only with difficulty walk abreast and the use of vehicles was practically impossible.²² In those regions neighbouring the Godāvāri, in the vicinities of Bhadrācalamu and Rēkapalli, there were no carts in 1870, despite the efforts of the government.²³

The utilization of vehicles was furthermore very restricted in the southern plains or on the Deccan Plateau.²⁴ In Tamil country their use seems to have played only a mediocre role. Father de Bourzes, from

17. *M.D.M., Cochin State* (Menon), 165.

18. 'Before the British occupation roads were mere paths very stony and steep and, where led up the ghauts, almost impassable... and over such tract it may be imagined no carts can run; in 1838 not one wheeled conveyance was to be found in all South Canara' (*Prof. Papers on Indian Engineering*, 1st Series, vol. III, 1866, 118).

19. *Bombay Gazetteer*, vol. X, *Ratnagiri*, 168.

20. Vide the experiences of seventeenth century travellers: Tavernier, *Travels*, vol. I, 142-3; Carré, *Travels*, vol. I, 166-220; La Boullaye-le-Gouz, *Voyages*, 192, 194.

21. *Mysore Gazetteer* (Rao), vol. II, 111. This observation seems to be exaggerated, for animal portage was very important everywhere on the Ghāṭs. In 1849, between 1 January and 30 June, 144,664 pack oxen traversed the Kumbhārli Pass (district of Sātārā), which makes an average of approx. 1,000 pack animals daily (*Bombay Gazetteer*, vol. XIX, *Satara*, 196 n. 1).

22. Walker, in *M.J.L.S.*, vol. XVI, 1850, 233. In 1909, according to the author of the *Gazetteer of the Central Provinces* (C.P.D.G., *Chhatisgarh Feudatory States*, 55), carts were rare in Bastar; those which did exist had solid wheels of wood; they were heavy and difficult to manoeuvre. The settlers having come from neighbouring regions had brought with them a type of lighter vehicle, but the *Gond* preferred to carry loads on their shoulders.

23. *Gazetteer of the Central Provinces* (Grant), 508.

24. 'As the Deccan is devoid of a single navigable river and has no roads that admit of wheel carriages, the whole of this extensive course is carried on by laden bullocks' (Briggs, *Account of... Bunjaras*, cited in *Hobson-Jobson*, 115).

the Maturai mission, wrote in a letter, anno 1713: 'Carts are no more evident than ploughs; there are so few that I do not think to have seen six since having been in this country... One does not know here what a carriage is; the grand seigneurs have themselves conveyed by means of palanquins, but they must first have the prince's permission to do so'.²⁵ This is confirmed by a study undertaken at the close of the eighteenth century: in certain zones of the present Ceṅkalpaṭṭu district, comprising more than five hundred villages, there was 'literally not a single vehicle'.²⁶ In the Nellūru district all goods transport was effectuated by beasts of burden; and, in 1847, the collector mentioned that he had made use of carts during his tours of inspection, as if this were a novelty.²⁷ It is clear from the various reports of the period that in the district of Koyāmuttūr (Coimbatore), there were no vehicles in 1800.²⁸ Briefly, according to documentation by the Commission of Public Works dating from 1852, one encountered in the former Presidency of Madrās, because of the miserable condition of the roads, only crude waggons with solid wheels, used to convey stone blocks to building sites or harvests in the villages. To these must be added several light vehicles with spoked wheels, which were used by wealthy proprietors.²⁹

At the beginning of the nineteenth century, the judicious observer, Buchanan, judged the role of carts (with solid wheels) in Maisūru to be derisory; furthermore, these were employed almost only to transport dung³⁰ (vide Fig. XXXIII). According to an official evaluation made in 1839,³¹ in the four collectorates of the Deccan comprising the regions of

25. *Lettres édifiantes*, t. XII, 74-5.

26. *Place's Report on the State of the Jaghir*, dated 6 June 1799, *Tamilnādu Archives*, ms No. 18858-493, 289. It pertains to the regions of KaruṅkuLi and Uttaramērūr, north of Maturāntakam. Reading Ānanda Raṅga Piḷḷai's diary, in which he noted the minutest details of daily life in the Pondicherry of Dupleix's time, one notices that he never makes mention of goods transported by cart, but of bags of rice carried by oxen as provision for the town (vide in particular, *Diary*, vol. IV, 379-81, 437, 455).

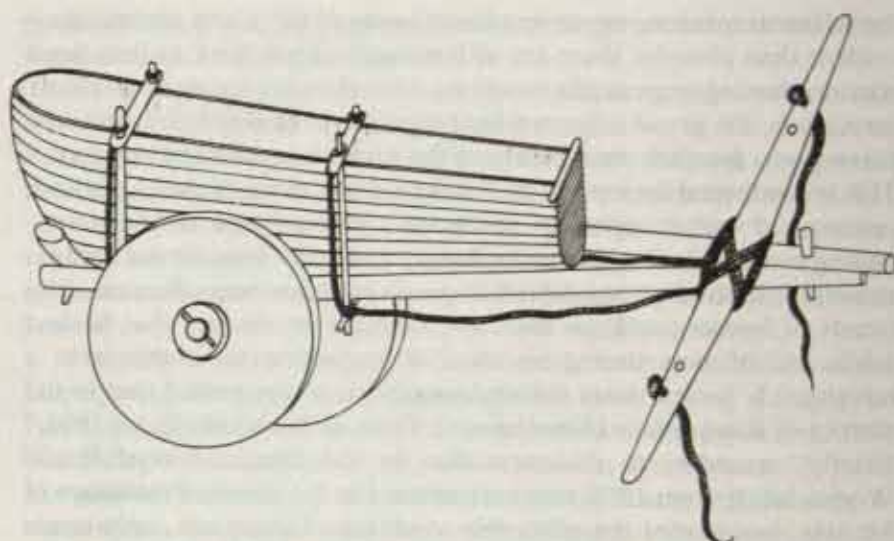
27. S.R. Srinivasa, *Memorandum*, XIX, 33.

28. *Ibid.*, 34; *M.D.M., Coimbatore*, 292.

29. S.R. Srinivasa, *ibid.*, 33-4.

30. Buchanan, *Journey*, vol. I, 184.

31. 'In the Dharwar collectorate there is one cart to 13 farmers. The unusual number of pack bullocks which carry loads on their backs in the Dharwar collectorate would seem to indicate that they are the chief means by which agricultural and other produce is transported from place to place. In Khandesh there is the least number of pack cattle and the greatest proportional number of carts. In Poona a great number of pack cattle and only one cart to 11 farmers. The proportion in Ahmadnagar, I do not know' ('Special Report on the Statistics of the four Collectorates of Dukhan under the British Government', *M.J.L.S.*, 1839, 398). It was thus only at Khāndesh that cartage played a role. For, it was there that the main route from the Gangetic Plain passed to the Gulf of Khambhāt. The relation between road and cart is significant.



XXXIII. Cart with solid wheels from Maisūru, based upon a sketch by Buchanan (1800) (*Journey*, vol. I, pl. V, fig. 11, f. p. 83).

Dhāravād (Dhārvār), Pune, Aḥmadnagar and of Khāndeś, the heavy *gādā* with solid wheels, used only during the harvest, was limited in number and assumed but a negligible part in local traffic as compared with the pack animal.

Conversely, in the northern plains one has clearly the impression that wheeled transport was much more common than in peninsular India. Buchanan, in an extensive study of the districts of eastern India which he made a few years later, mentions the regular employment of carts to transport merchandise and convey travellers in villages and towns. In the district of Patnā, 'two wheeled carriages drawn by oxen are here called *chakrā* and many of them are hackneys standing for hire in the streets or in country parts are let from stage to stage'.³² In the Gorakhpur district, 'wheel carriages are a good deal used for the conveyance of goods and would become general did the roads admit of them. The cart (*larhī*) of this country resembles entirely in structure that of Mysore. It is not quite so rude, the wheels having spokes, and being of course much lighter'.³³ In the district of Purṇiyā, 'many others have a proper carriage for travelling made neater and lighter than that used by carriers. These are of two kinds, *mañjhōlī* and *rahrū* which differ chiefly in the manner by which the traveller sits'.³⁴

32. In Martin, *Eastern India*, vol. I, 124. He adds (*ibid.*, 386): 'The natives here are fully sensible of the vast advantage attending the use of carts in preference to pack loads; and the roads through which I saw carts conducted really astonished me'.

33. *Ibid.*, vol. II, 581.

34. *Ibid.*, vol. III, 118-9.

All of which goes to say, that there existed in these regions a variety of wheeled vehicles which were unknown to peninsular India. Furthermore, the testimony of other foreign observers is unequivocal: whereas in the North, in the valleys of the Gaṅgā, or from the Jamunā to the Gulf of Khambhāt,³⁵ hundreds of carts were frequently used in caravans to transport goods, in the Vijayanagara kingdom all transport was effectuated by pack animals.³⁶ Tavernier³⁷ specifies in his account that south of Gōlukonḍa carts were not used for travelling and that only pack animals and palanquins were employed.

A Much Debated Question

This then apparently contradicts ancient texts and inscriptions,³⁸ and seems to be an excessive simplification. If there had been carts in South India during the first centuries of the Christian era, why then did one during the sixteenth century in the great Vijayanagara kingdom prefer to effectuate the transport of goods by means of pack animals? The interpretation of the documents at our disposal is problematic.³⁹ It is quite evident that wheeled vehicles existed in the southern plains: carts were used by the armies and in processions, as depicted in the war

35. Mundy, *Travels*, vol. II, 45; Coryat, in *E.T.*, 260; Tavernier, *Travels*, vol. I, 33; Della Valle, *Travels*, 63; Fryer, *New Account*, vol. III, 156.

36. Paes and Nuniz, in Sewell, *A Forgotten Empire*, 248, 347.

37. Tavernier, *Travels*, vol. I, 142.

38. Appadorai (*Economic Conditions*, vol. I, 31, 425-7), noting that vehicles are mentioned in the inscriptions, conjectures that European travellers, such as Tavernier, perhaps did not encounter them in the regions through which they passed!

39. In the course of our study, we have requested the collaboration of several people in different regions of India, and were surprised to constate that the terms of a simple questionnaire could upset local sensitivity. Here is an example drawn from an exchange regarding this subject with a professor in Kēraḷa. We noted in an initial letter the passages from Ibn Baṭṭūṭah and from C.A. Menon (in *M.D.M., Cochin State*) concerning the absence of cartage in Malabar, which resulted in an indignant response: 'Bhārat has meant bullock-carts and vice-versa for centuries, Kālidāsa refers to them and certainly Kālidāsa is not a 19th century poet! If we did not have bullock-carts, what did we have? Jeeps and thunderbirds? To say that we had no bullock-carts is to suggest that the invention of the wheel had not penetrated to us. Early 17th century malayālam writings refer to carts drawn by one or two bullocks.... Some of the old songs of North Malabar mention delectable maidens going on pilgrimages in covered bullock-carts; those songs are certainly older than two centuries...' In the succeeding letters our correspondent adopted a somewhat less aggressive attitude, and after having consulted the son of the author of *M.D.M., Cochin State*, he ultimately avowed that the information compiled by C.A. Menon was from serious sources and that most probably there had, in fact, existed in Malabar no road accessible to carts, nor even to pack animals, prior to the mid-nineteenth century!

scenes or portrayals of parades in the bas-reliefs of the large temples.⁴⁰ However, the carts as used in the countryside were few and played a meagre role in long-distance transport. This is to be concluded from the testimony of attentive observers such as Tavernier, Buchanan and various employees of the *English Company*.

How is this fact to be explained? Geographical circumstance is only to a certain extent responsible. Granted, mountains such as the Ghāṭs, or low-lying regions furrowed by rivers, such as the strip along the western coast, were not favourable to the wheel. But elsewhere, on the Deccan plateaux or the eastern plains, the natural conditions were just as favourable to cartage as were the flat regions in the North. Human factors would appear to be more decisive. It has been observed above, that the populations of Hindusthān gave evidence of much greater ingenuity than those of the Deccan as pertains to the construction of carts, and that they had produced different vehicles well adapted to the roads such as they previously had been. It should also be noted that this advantage which the North had over the South was perhaps resultant of the fact that over the centuries greater attention was given there to roads and their maintenance than on the peninsula: at least since Aśoka, the sovereigns of the Gangetic Plain were interested in the question of roads, and particularly in the good condition of the Grand Trunk Road and the axes leading to the Gulf of Khambhāt. Finally, the main reason is indubitably more simple.

As for the southern region, south of the Āndhra deltas, it might be asked if there had not been a phenomenon of compensation, and if the modes of transport would not have remained rudimentary as a result of the hypertrophy of maritime transport. It is interesting to note that enlightened people, whom we have consulted on this subject, have all had the same thought: The majority of the southern commercial centres are located at a distance of less than 100 miles from the coast; each region produced just about everything required for its subsistence, excepting salt; thus, it would have been sufficient to have transported those products destined for large commerce as far as the nearest port by means of pack animal, whence they could have been conveyed anywhere by boat. It was therefore not necessary to construct at great cost carriageways and to make use of wheeled conveyance.⁴¹

Vehicles

We shall not undertake here to write a history of vehicles in India; thus,

40. For example, at Bēlūru and Halēbīḍu.

41. In tropical India portage by means of pack oxen was a transport mode at once powerful and supple: admirably adapted to the ancient travel conditions, it could not be considered inferior to cartage. Thus in the southern realms, one generally sufficed with pack animals for the conveyance of goods, as these were

such questions as pertain to the different types of wheels are not discussed: solid wheels, present in almost all regions of India, especially on the peninsular plateau; spoked wheels, previously less extensively utilised than today; and, above all, wheels with double transversal shafts passing through a thick hub, only to be found north of the Vindhya. A separate study is reserved for this subject.⁴²

The only precise information available relating to the Mughal period pertains to vehicles north of Hindusthān.⁴³ There were at that time two types: the carts which were used by travellers, and the waggons intended for the transport of goods. The first, generally drawn by oxen (*bahālī*, *mañjholī*, *rahṛū*, etc.), or occasionally by horses (*ghoṛ bahal*, *ekkā*) (vide Fig. XXXIV), were fitted out with a seat and a kind of baldaquin, supported by bamboos, and were decorated according to the social status of the passengers,⁴⁴ with a carrying capacity of one or several persons. In western India they could cover some 50 km a day with oxen of good quality which were able to sustain a reasonably brisk pace.⁴⁵ In the countryside of eastern Bihār (Purniyā district), where the animals were less efficient, the *mañjholī* and *rahṛū* covered at the time of Buchanan a daily distance of only some 20 or 32 miles.⁴⁶ One also

ultimately more efficient and reliable than were vehicles.

42. *Contribution à l'histoire de la voiture en Inde*, 1-103, pls. I-XXXI.

43. Among the European travellers to have visited the Mughal empire, some have described the Indian vehicles, albeit in a vague fashion (Thévenot, *Travels*, 75; Tavernier, *Travels*, vol. I, 35-7; Della Valle, *Travels*, 21; Ovington, *Voyage*, 151-2; Fryer, *New Account*, vol. III, 157; Grose, *Voyage*, 254-5; Degrandpré, *Voyage*, t. I, 228-9; Broughton, *Letters*, 156; Hodges, *Travels*, 5; Forbes, *Oriental Memoirs*, vol. I, 150; vol. II, 253; vol. III, 376). Only Buchanan, in the course of his studies in Maisūru, Bihār and Baṅgāl (*Journey*, vol. I, 184 and fig. II, f.p. 83; Martin, *Eastern India*, vol. I, 124; vol. II, 581; vol. III, 118) took care to note the characteristics of the vehicles and their local names. Pictorial depictions of vehicles are not numerous: Rajput, Mughal and Himālayan miniatures sometimes represent light vehicles intended to convey travellers (vide S.P. Verma, *Art and Material Culture*, 107-8 and pl. LXX); Solvyns presents in his magnificent prints (*Les Hindous*, t. III) several types of vehicles of Eastern India, which we have reproduced here (Fig. XXXIV).

44. Fitch (in *E.T.*, 18) states that during Akbar's time, numerous light two-wheeled conveyances trafficked between Āgrā and Fatehpur Sikrī, covered with silk cloth embroidered with gold and drawn by two small oxen the size of large English dogs.

45. Tavernier (*Travels*, vol. I, 37) specifies that the animals which he used could in the course of a long journey of two months cover each day between 12 and 15 French leagues (48 and 60 km). Thévenot (*Voyage*, 152) and Perrin (*Voyage*, vol. I, 104) make the same observation. This is approximately what Forbes indicates (*Oriental Memoirs*, vol. II, 184): 30 to 40 miles, while stating that this daily pace was only possible with the strong oxen of Gujarāt.

46. Buchanan, in Martin, *Eastern India*, vol. III, 118-9.



a.



b.



c.



d.



e.



f.

XXXIV. Rural vehicles of North India, based upon engravings from the end of the 18th century; a., *bahlī* of Gujarāt (from Forbes, *Oriental Memoirs*, 1813 edition, vol. I, f. p. 84); b., *ghor bahal*; c., *rahrū*; d., *ekkā*; f., *saggār*, vehicles of Baṅgāl (from Solvyns, *Les Hindous*, t. III).

found in the western plains light four-wheeled carts drawn by oxen and reserved for the wealthy, bankers or dance groups.⁴⁷ More robust carts (*chakrā*, *larhī*, *saggar*),⁴⁸ also having spoked wheels, were utilized for field work and the transport of goods, as well as heavy waggons with solid wheels drawn by several pairs of oxen,⁴⁹ which have today disappeared except in a few archaic and isolated corners.

Low-capacity Loads

These solid carts could nevertheless not carry heavy loads. Certainly, over short distances, as for example from the farm to the market, using a sufficient number of draught animals these carts with solid wheels could be laden with about a ton of goods.⁵⁰ Marshall⁵¹ mentions in 1671 that in Paṭnā a cart drawn by two oxen could convey 40 *sāhjahānī man*, or 1,330 kilos. However, these figures are not confirmed by the merchants. In Paṭnā, the Englishman Parker, wanting in the year 1621 to send his merchandise to Āgrā, confided it to carriers who distributed the goods in waggons on the basis of one ton to each vehicle. He was greatly surprised to then see at the exit of the city that the men had unloaded the carts, judging that the weight of the merchandise was too heavy.⁵² Thomas Roe, in a letter to the English Company, dated 1 December 1616,⁵³ specified that a cart could carry the equivalent of three camel-loads, being approximately 600 kilos, which corresponds to

47. Solvyns, *op. cit.*, s.v. *routh*; Buchanan, in Martin, *Eastern India*, vol. I, 124; vol. III, 118; Broughton, *Letters*, 1892 edition, 117.

48. Vide Buchanan, in *op. cit.*, vol. I, 124, 559; vol. II, 288, 703, 1017; vol. III, 118, 319, 348.

49. 'The wheels of waggons or carts, for carrying of goods, have no spokes; they are made of one whole piece of solid timber, in form of a mill-stone and the bottom of the cart is always a thick frame of wood' (Thévenot, *Travels*, 75; vide also Tavernier, *Travels*, vol. I, 37).

50. That was the load which was consigned to a stone-wheeled cart in the south of the peninsula at the beginning of the nineteenth century (S.R. Srinivasa, *Memo-randum*, 33-4); one loaded 40 *man*, or 1,200 kilos on the carts in the Daulatābād district (*M.J.L.S.*, vol. XV, 1849, 503); 1½ tons on the vehicles of the Pañc Mahāl in Gujarāt (*Bombay Gazetteer*, vol. III, *Kaira and Panch Mahals*, 242). In the mid-nineteenth century one used for the transport of wood in the tarāi of the Western Himālaya, between Kumāyūm and Pilibhūt, carts which, drawn by 4 or 6 pairs of oxen, could carry a load of 200 *man* (7 to 8 tons); this being two or three times the load of a cart constructed according to European principles (F.J. Burgess, 'Topographical Notice of the Bhabur and Turai Tracts lying between Kumaon and Pilleebheet, 1853', in *Selections from the Records of Government, N.W. Provinces*, vol. III, 133).

51. Marshall, *Notes*, 425-6.

52. *Factory Records, Patna*, vol. I, letters of 11 April and 19 May, 1621; Mundy, *Travels*, vol. II, 367.

53. *Letters Received*, vol. IV, 250.

the figures given by Buchanan concerning the capacity of carts in Bihār, where the transported loads varied from between seven to fifteen *man*, i.e. from approximately 300 to 560 kilos.⁵⁴ Roe's information also tallies with that provided by Cordier at the beginning of the nineteenth century regarding the carts of Kāraikkāl, which transported between 500 and 700 kilos of rice,⁵⁵ as well as with the results of a study undertaken in Mumbai (Bombay) in 1837, in which it was estimated that the weight which could be consigned to the carts of Maratha country was 1,500 pounds, or 675 kilos.⁵⁶

Even by harnessing several pairs of oxen and augmenting the force of traction, one could not escape the constraints of the wheel, which has a tendency to sink into friable soils, can be easily halted by protruding obstacles and, furthermore, obliges that the load be distributed higher than the spoke, which results in the upward displacement of the cart's centre-of-gravity and thus reduces its stability. In the northern plains, the loads could indeed be augmented during the dry season (still, it was necessary to anticipate the more difficult passages, fords in particular); but in regions of arduous relief, certain limits could not be exceeded. Also, one was obliged to increase the amount of human energy expended, and engage men to prevent that the carts be upset or come to ruin.⁵⁷ In Akbar's time, according to official regulations in usage in the imperial stables, each group of ten carts must necessarily have been accompanied by a carpenter.⁵⁸ The carts commonly carried spare parts.⁵⁹ It was usual practice in Central India to

54. In the district of Dinājpur, where the carts were smaller and the oxen of inferior quality, the loads were quite light: between 7 and 10 *man* (of 98.5 lbs.), i.e. between 313 and 446 kilos; in the Purniyā district, 12 *man* (of 98.5 lbs.), or 535 kilos; from Paṭnā to Gayā (115 km), the vehicles carried from 12 to 15 *man* (of 82 lbs.), or from 445 to 557 kilos (Buchanan, in Martin, *Eastern India*, vol. II, 1017; vol. III, 319; vol. I, 387).

55. 'Each cart ordinarily carries 20 galons 30 markals (713 kilos), if the oxen are sturdy; those which are weak and harnessed to carts only transport from 15 to 18 galons (from 528 to 633 kilos) of nelly' (Cordier, *Historique*, 121). Place's *Report on the State of the Jaghir* (Tamilnāḍu Archives, ms. No. 18858-493, 288) specifies that a cart could carry a load equivalent to that of 10 oxen.

56. 'Memorial from inhabitants of Bombay', dated 20 September 1837, No. 4, 434 n., cited by Guha, in *I.E.S.H.R.*, vol. IX, 1, 1972, 21.

57. 'When a merchant conveys anything of consequence, he ought to have four soldiers or four peons by the side of the waggon; to hold the ends of the ropes that are tied to it, to keep it from overturning, if it come to heel in a bad way; and it is thus in all caravans' (Thévenot, *Travels*, 75; same observation in Tavernier, *Travels*, vol. I, 35).

58. *Ā'in*, vol. I, 159.

59. This fact is mentioned in the Tamil texts (*PuRanāNūRu*, 102, cited by N. Subrahmanian in *Sangam Polity*, 115), and it is confirmed by the old *Gazetteers* (*Bombay Gazetteer*, vol. XII, *Khandesh*, 145).

calculate the length of a journey in terms of the number of axles broken on the way.⁶⁰

Under such conditions, with a maximum load which could scarcely exceed 600 kilos,⁶¹ the carts covered but relatively short distances in one day: some 20 km,⁶² which nevertheless offered certain advantages over pack animals.⁶³

Comparison with Contemporary Carts

A comparison with the capacities and rates of today's carts is of interest. The table below, taken from a recent study⁶⁴ made in five

60. Thus a long journey corresponded to so many hundred broken axles (C.P.D.G., Yeotmal, 141).

61. It has been estimated that in South India at the beginning of the nineteenth century carts could transport no more than $\frac{1}{3}$ of the load with which they could have been laden, had the roads been good and built with solid foundations (R. Srinivasa, *Memorandum*, 34).

62. It is interesting to note, that the figures provided by the observers of the period concord almost exactly: Forbes (*Oriental Memoirs*, 1813 edition, vol. II, 407) indicates 10 or 12 miles on the roads of western India, and Buchanan (in Martin, *Eastern India*, vol. II, 1017; vol. III, 319) mentions 12 miles on the roads in the Purniyā and Dinājpur districts.

63. Thomas Roe, in his letter of 1 December 1616 (*Letters Received*, vol. IV, 250-2), judges that the transport by cart was less costly, and both more convenient and certain than animal portage. He emphasizes in particular that goods which need not be loaded and unloaded daily suffered much less from transport. At the close of the eighteenth and beginning of the nineteenth centuries, the English administration was interested in this question, which was linked with that regarding the creation of solid roads. In 1799, Place noted in his report on the Ceṅkalpaṭṭu district that the pack oxen covered daily distances of 8 miles with loads of 8 *mercals* (78 kilos?), corresponding to the load *carried by three men*; whereas, a cart drawn by one pair of oxen could cover at least 20 miles a day and convey at least 80 *mercals* (780 kilos?), representing the *load of ten oxen* (Place's *Report on the State of the Jaghir, Tamilnāḍu Archives*, ms. No. 18858-493, 288). In Mumbai, according to local evaluations in the year 1837, a pack ox could normally carry from 240 to 250 lbs. (from 108 to 113 kilos) over a daily distance of 8 to 10 miles, and a large ox, in exceptional cases, up to 500 lbs. (226 kilos). A pair of oxen, on the other hand, harnessed to a light vehicle, could transport 1,500 lbs. or 679 kilos, if not more, over some 20 miles. Whereas the pack oxen must have been laden and unladen at least twice each day, so as to graze, the draught oxen could be unharnessed without the goods having been affected. Furthermore, at equal loads, the time required to harness 100 pairs of oxen did not exceed a quarter of that necessary to load 600 oxen. Thus, an ox harnessed to a cart had an efficiency 6 or 7 times greater than that of a pack ox ('Memorial', cited in *I.E.S.H.R.*, vol. IX, 1 March, 1972, 21).

64. *Role of Bullock-carts and Trucks in Rural Transport — Case Studies*, 1963, 12-114. Five markets were chosen: Sarhind, Paṭiyālā district, in Pañjāb; Gorakhpur, in Uttar Pradesh; Tiṇṭivānam, South Arcot district, in Tamilnāḍu; Lasalgāmpv, Nāsik district, in Mahārāṣṭra; and, Sānthiyā, Bīrbhūm district, in West Baṅgāl.

Fig. XXXV Ox-carts in India today: five regional examples

regions	capacity (in <i>man</i>)		actual load transported (in <i>man</i>)	hourly rate (in miles) on roads		daily distance covered (in miles) according to season	
	local variations	average		<i>kaccā</i>	<i>pakkā</i>	fair	inclement
Sarhind, Panjāb	10-35	22.79	18.2 (686 kg)	1.5-2.5	2-3	10-15	2-5
Gorakhpur, Uttar Pradesh	15-25	18.90	16.6 (625 kg)	1-1.5	2-2.5	11.4	1.3
Tinjivānam, Tamiḷnāḍu	14-16	15.76	11.6 (437 kg)	3	4	15-14	
Lasalgāmv, Mahārāstra	12-15	13.5	10.2 (384 kg)	1-2	2-3	7	4
Sāinthyā, Bāṅgāl	8-20	11.5	7.8 (294 kg)	1.3	2.1	15.5	4.2

Indian states, provides figures which do not appreciably differ from those which we have gleaned from the ancient texts.

The carts in the northern plains (Sarhind and Gorakhpur), which have a greater capacity and are more fully utilized than those of other regions in India, transport loads (625 to 686 kilos) which are somewhat greater than those mentioned by Buchanan for western Bihār at the beginning of the nineteenth century,⁶⁵ but, elsewhere, the capacities are quite low (437, 384, 294 kilos). As regards the hourly rate and the daily progress, these have evidently not increased except on the *pakkā*, tarred roads.

Nevertheless, there exists a significant difference between times past and present. Since the railways have diverted to their advantage long-distance traffic,⁶⁶ carts are only utilized within a small radius, usually from village to market; whereas, in earlier times they were also used for longer distance transport in those regions favourable to cartage.

For very heavy cartage, vehicles with four (or more) large solid

65. 12 to 15 *man* (445 to 557 kilos) in Paṭnā (Buchanan, in Martin, *Eastern India*, vol. I, 387). This increase is probably resultant of the amelioration of the roads.

66. The establishment of the railway in Maratha country, between Dhaund and Manmād, has to a great extent halted long-distance cartage to Pune and Mumbai (*Bombay Gazetteer*, vol. XVII, *Ahmadnagar*, 342).

wheels and drawn by several pairs of oxen or buffaloes were used. In this manner, stone blocks weighing several tons were conveyed over very long distances. The transport of an enormous pillar of fourteen metres' length is portrayed on a wall of the Rāyçūru fortress, dating from 1294. Large artillery was displaced in this manner during the military operations of the Mughal period⁶⁷ (vide Fig. XXXVI, d.).

Carriers

Several types of carriers were distinguished at local and regional levels. Firstly, there were the peasants or merchants who utilized their own carts to transport their harvests or merchandise to neighbouring markets. Thus, in Bihār, the *laṛhiyā bepārī*, large farmers who at the same time engaged in commerce with grain and fire-wood, possessed a good number of draught animals which they harnessed to their carts (*laṛhiyā*).⁶⁸ Many landowners found occasion to supplement their revenues by hiring out their carts at the beginning of the hot season, when field work demanded less attention.⁶⁹ It would seem moreover, that certain castes had done this more readily than others.⁷⁰ In the Gulf of Khambhāt region, which was a terminating point for large-scale international commerce, cartage was provided by professional carriers, Muslims, the *Nāghorī* in Surat, and the *Ghāñcī* in the Panc Mahāl.⁷¹

Naturally, there was no prevailing uniformity and conditions were variable from region to region. In eastern India, for example, it was easy at the time of Buchanan to procure carts so as to travel or transport goods in the interior of the Purniyā district.⁷² Light carts for travellers were found everywhere in the Bihār region, and could be hired from stage to stage of the journey;⁷³ while in the Dinājpur area, vehicles of this type were few in number, except in the capital.⁷⁴ Finally, in the Śāhābād region, they were scarcely utilised.⁷⁵

67. *Annual Report of the Arch. Surv. of his Exalted Highness the Nizam's Dominions*, 1929-30, pl. VII, a. An *Akbar-nāmah* miniature (reprod. in Hambly Gavin, *Cities*, pl. 21) depicts the transport of a large cannon at the time of the siege of the Rāṇṭambhor fortress; an engraving by Creighton (*Narrative*, pl. 8, f.p. 145) shows the transport of the famous Bharatpur cannon, 18 January, 1826.

68. Buchanan, in Martin, *Eastern India*, vol. II, 569.

69. *Ibid.*, vol. III, 348; *Bombay Gazetteer*, vol. XVII, *Ahmadnagar*, 342.

70. In the district of Ahmadnagar, carters were recruited among the *Kāsār*, the *Kunbī*, the *Lingāit*, the *Mālī*, the *Mārvārī*, the *Teli* and the Muslims (*ibid.*, 342); also *ibid.*, vol. XI, *Kolaba and Janjira*, 121).

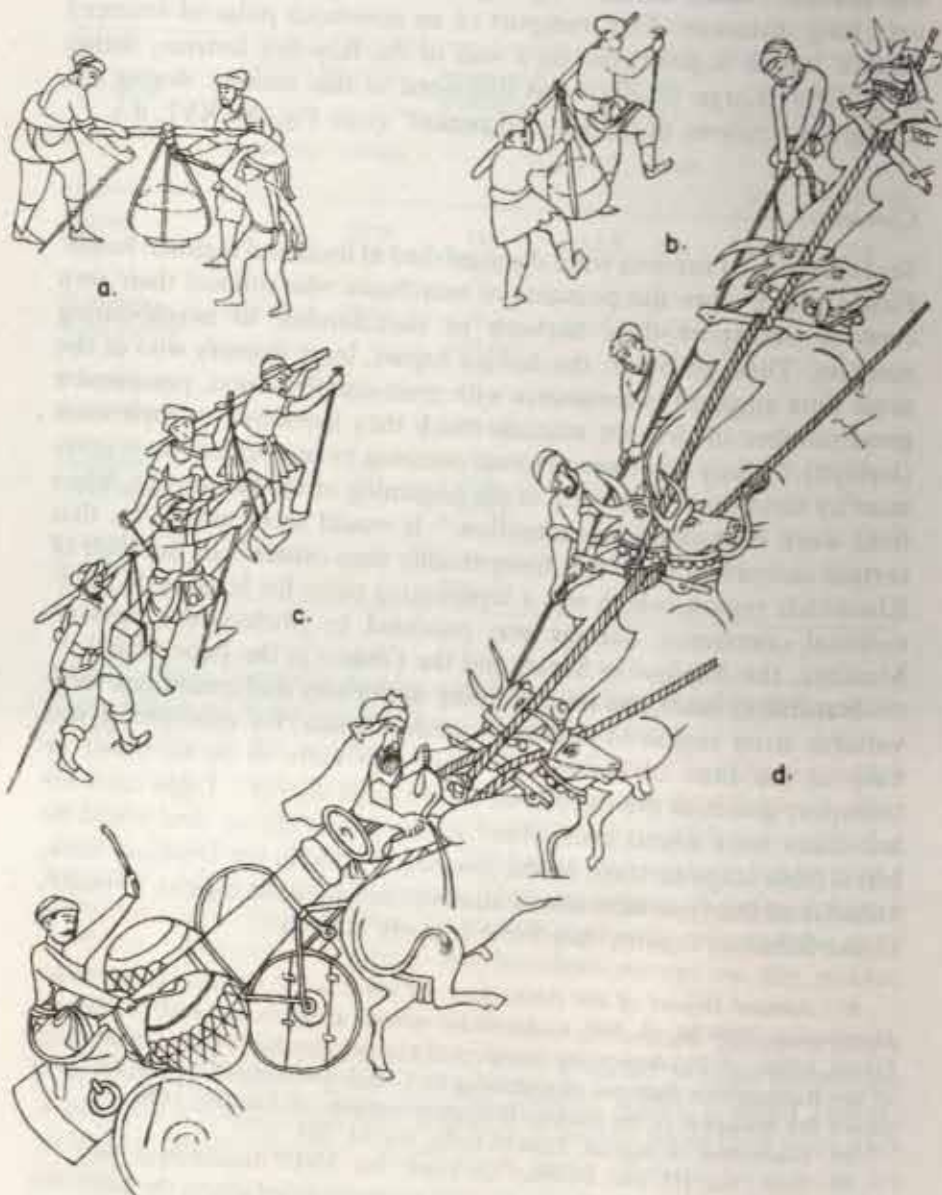
71. *Bombay Gazetteer*, vol. II, *Surat and Broach*, 425; vol. III, *Kaira and Panch Mahals*, 241.

72. Buchanan, in Martin, *Eastern India*, vol. III, 348, 319.

73. *Ibid.*, vol. I, 124.

74. *Ibid.*, vol. II, 1017, 703.

75. *Ibid.*, vol. I, 558-9.



XXXVI. Porters and cart with four wheels, based upon miniatures of *Akbar-nāmah* (circa 1600); a., b., c., porters employed in the construction of the Āgrā fort (reprod. in Verma, *Art and Material Culture*, plates LXXVI, LXXVII); d., transport of a large cannon at the time of the siege of the Rāṇṭambhor fortress (reprod. in Hambly Gavin, *Cities*, pl. 21).

This scant amount of information is valuable, for little is known concerning the inter-regional carriers who carted the luxury products from the centres of collection to the trading centres on the coast. The English agents of the seventeenth century refer repeatedly in their correspondence to the contracts which they signed with these carriers, but having neglected to describe them, these men remain anonymous. For the Europeans who travelled in Hindusthān, all the cameleers were *Balūcī*, and all the waggoners, *Jāt*.⁷⁶

*The Qāfilah*⁷⁷

It is known that on long journeys the vehicles, whose number varied according to actual requirements,⁷⁸ were generally associated with the pack animals in the *qāfilah*, or caravans. These, for reasons of security, were often formed in a spontaneous manner around the nucleus of privileged travellers, merchants accompanied by guards, or noblemen followed by an armed escort.⁷⁹ The weaknesses of these heterogeneous groupings are obvious. Other than disciplinary problems and those regarding food posed by the multitude of men and animals,⁸⁰ there were

76. Mundy, *Travels*, vol. II, 257.

77. In Muslim India, the Arabian word *qāfilah* was used to designate caravan, rather than the Persian word *karvān* (vide *Hobson-Jobson*, 161).

78. Carriers accepted to transport greatly varying loads; mention is made of two carts dispatched from Patnā to Āgrā on 19 May 1621, and of eleven carts sent from Āgrā to Burhānpur (*E.F.*, 1618-21, 256; 1622-23, 90). According to Tavernier (*Travels*, vol. I, 35), the number of vehicles in the convoy did not exceed 200.

79. Mundy (*op. cit.*, vol. II, 45), while on the route from Surat to Āgrā, saw the caravan increase from 150 persons to 1,700 in less than ten days; the number of carts and pack animals had increased in the same proportions: 'Besides the caphila consisted of such a multitude of carts and people which drew to such a length, that hitherto we could never see both ends from one place and yet increased day by day'. Modave (*Voyage*, 320-1) made the same observation in 1775: 'The Hindu merchants and generally all travellers fear so greatly these thieves that they dare not set out without the most extreme precautions. When they know that Europeans must be passing, they await and join up with them. During the first journey which I made to *Dehli*, I collected such a large number in the first days of my itinerary that a caravan of 400 to 500 persons was formed. They all followed me constantly until we had come within view of *Dehli*. Everyone then went about his own affairs and they departed without thanking me for the security with which I had provided them'.

80. Tavernier (*Travels*, vol. I, 35) states that the size of some *qāfilah* was such, that travellers coming from the opposite direction were sometimes obliged to wait two or three days until they had finished passing. Della Valle (*Travels*, 63) noted at Jambusar (to the south of Bharuc): 'The Kafilā was so great and the coaches so many that in certain narrow places we were bound to stay a good while before they could go forward, just as it happens in the streets of Naples and Rome at solemn pomps'.

also difficulties in harmonising the regular advance of the different modes of transport. Camels, pack oxen and oxen harnessed to the heavy carts of Hindusthān did not proceed at the same rate. When, in addition, it was necessary to adapt to the pace of light equipages of some wealthy patron travelling with swift elephants, only deplorable contretemps could result. To give a vivid example, we relate here the experience of Peter Mundy, who in 1633 had been charged to conduct the last caravan of the season, consisting of 268 camels and 109 carts, from Āgrā to Surat. Underway Mundy encountered the new governor of Gujarāt, Bāqir Khān, who was journeying to his residency along with his entourage, and asked to accompany him in the hope that he would thus avoid payment of local taxes and thereby reduce the transport expenses. This decision proved to be imprudent and costly. The troubles soon began. It was impossible for Mundy's caravan to keep pace with the fast rhythm of the official escort. At Khāmvā, a sand-storm broke, followed by profuse rains; the camels were thus delayed and reached the next stage one day after the carts. Fortunately, the governor had halted because of the rain, and together they continued onwards to Bayānā. Two miles before arriving at that destination, one cart wrecked and another became stuck in the river; it was impossible to extricate it, and the men had to carry the bales of indigo on their shoulders. The 170 servants whom Mundy had hired took advantage of the cover of night to vanish. The merchandise was damaged and it was almost midnight when all the carts could be assembled. By chance, Bāqir Khān had made another halt so as to preside over a reception offered by local authorities. To the west of Ajmer the track was in bad condition. Ten or twelve oxen were needed to pull a single cart over a quarter-mile of deep sand, and almost two nights were required to pass through. The news that a Dutch caravan had been attacked recalled the necessity to remain in the governor's company. A stop at Mērtā allowed Mundy to re-assemble his dispersed cattle and goods, as well as to regulate the demands made by the waggoners. In the meantime, a multitude of pilgrims and merchants had joined the caravan. Eight days transpired during which one attempted to remain in contact with the official convoy; but, several carts had fallen behind despite the efforts made by the men to advance the 'poor cattle', which did not even have time to graze. Mundy was therefore obliged to separate from his protector, who now made haste. The effort had already caused 'the exhaustion or death of around 350 oxen, not to count the camels'. It was necessary to remain in Jālor for two days, so as to repair 'the tottering and broken carts'. To heighten the misfortune, the carriers again complicated his task. Three carts did not arrive at Sirohī with the remainder of the caravan; the cameleers complained that their goods had not been weighed and that their camels were over-loaded. At the announcement that bandits were

laying an ambush for them, the leader had to hire the services of cavalymen and foot soldiers, which successfully countervailed an attack. But then, a quarrel broke out between cameleers and wagoners; blood flowed. It was, deplored Mundy, 'the result of the combination of carts and camels, of *Jāt* and *Balūcī* in one and the same caravan'. At last, they arrived in Aḥmadābād.⁸¹

Animal and human portorage, and above all cartage, were thus susceptible to physical and geographical factors, particularly to the nature of the terrain and to rainfall, which determined the rythm of land travel.

81. Mundy, *Travels*, vol. II, 225-87.

4. The Rhythm of Land Travel

a. THE SEASONS

Travel was in fact punctuated by the radical alternation of two distinctly contrasted seasons, the humid and the dry, which are prolonged by intermediary seasons and marked by significant regional variations.

The Monsoon Interim

The humid monsoon,¹ an immense 'tidal bore' invading the subcontinent, impelled by an irresistible force, signified the slackening of normal activities.² It approaches the south-western coast in the beginning of June, then slowly advances, such that its effects are only felt throughout the country towards mid-July. Long-distance travel had to reckon with this progressive movement. If it might still have been possible to travel in the mid-Gangetic Plain as late as the 15th or 20th of June, to envision the dispatching of a caravan towards the ports on the Gulf of Khambhat was already out of question. The concern to avoid being overtaken by the rains and thus to preclude the ensuing transport difficulties, as well as the apprehension of arriving too late at the

1. The rainy season, or monsoon (*mausim*, season, for Arabian navigators, which general usage reserves for the humid winds or the rain of the summer months) has such importance as a source of life, that in Sanskrit, *varṣā*, rain, expresses also the notion of year.

2. In Hindu tradition, this season (*caturmāsa*, period of four months) is not considered to be favourable to travel. Viṣṇu is said, at this season, to retire to the ocean's depth to rest four months, and the earth thus no longer benefits from his protection. During this time it is recommended that one scrupulously follow the religious injunctions, that certain alimentary restrictions be observed, and that one refrain from those ceremonies accompanied by processions, such as marriage or the conferring of the ritual thread, etc. All of these prohibitions probably have their origin in the unwholesomeness of the climate and the difficulties presented to travel. The itinerant monks must cease their peregrinations and attach themselves to an hermitage (Underhill, *Hindu Religious Year*, 34). The wet season is a well exploited theme in Indian literature. Kalidāsa employed this motif with consummate skill in his *Meghadūta*, 'the cloud messenger'. An ancient ballad of Rājasthān says: 'This is the season when even the crane does not tread the inundated earth... In this season nothing roams; only beggars, the *Cātak* and thieves... Rivers, streams and cascades are swollen with rainfall, the camel's foot slips in the mud... wait at least 'til *Dassera*' (*Les Duhā de Dhola-Mārū*, transl. Ch. Vaudeville, 76-7).

coastal ports and then not being able to ship the goods, are found again and again in the documents of the European *Companies*.³ The outbreak of the monsoon, with its roaring thunder and cataracts of rain which swelled streams and rivers beyond bounds, was fatal to tracks and natural routes developed by man which did not resist the rushing waters. Jacquemont spoke thereof with humour:

While on the march, it's diabolical when the rain persists. The tents then become frightfully heavy and the camels which carry them slip with each stride on the sodden earth; their thighs, very much jointed to their pelvis (not displeasing divine providence) become dislocated, and can often not be re-set; the bullock carts drawing the heavy baggage are buried in the mud; all the servants, cattlemen, cameleers and soldiers are crestfallen and their tails hang between their legs; they become deaf and dumb, half-paralysed. The traveller's lot is not always a gladsome thing.⁴

Should a caravan have been caught unawares by the bad-weather season, it was liable to significant delays as well as to costly losses (injured animals which would have to be abandoned, broken carts, damaged goods).⁵ It was for this reason that the agents of the European *Companies* were unable to find carriers during this period.⁶ A report of 3 August 1621 indicates that it was impossible to secure any transport on the route from Patnā to Āgrā prior to the month of October, the roadways being cleft by gullies.⁷ Peter Mundy ventured this way with eight carts in August 1632, and had to exert great efforts to get through.⁸ Modave, on the route from Āgrā to the Deccan, had to surmount similar difficulties in July and August 1776.⁹ Traffic was thus

3. *Inter alia*, *E.F.*, 1618-21, 284.

4. *Découverte de l'Inde éternelle*, 258.

5. *Vide E.F.*, 1622-3, 96, 111, Ahmadābād, 25 June, 1622 and Burhānpur, 17 August, 1622; *ibid.*, 1655-60, 69, Āgrā, 3 July, 1656.

6. *Vide E.F.*, 1618-21, 283-4. Even offering threefold the usual tariff, no one wanted to transport the purchased articles. The men who had consented to do so for Hughes, abandoned the merchandise on the road and fled.

7. *Vide E.F.*, 1618-21, 258.

8. He was the first trader to have travelled with carts subsequent to the beginning of the rainy season. In the account of his tribulations, he recollects the storms which reminded him of those at sea; thunder, lightning, wind and rain; the carts, sunk to the axles in ruts, which the screaming cameleers attempted to support (Mundy, *Travels*, vol. II, 133-4, 110-1).

9. '22 (July), it rained throughout the day and the roads were so impassable, that the camels sank and collapsed at every moment. They stopped at *Nāgdā*, having marched but two coss... We intended to set out the following day, but a considerable rain, lasting almost all the night, brought the decision to remain the day of the 29th (August) at *Pacpahar*, in the hope that the roads might dry somewhat. These hopes came to naught, for the day was as rainy as had been the night... 30th, the roads were so miry that our march covered but two coss... 31st, the roads were so bad that one had great trouble getting through. The animals sank in the mud to the point that we all were occupied in extricating them. One of my

not entirely brought to a halt, but considerably retarded. The inclement weather, which marked an abatement of economic life, also signified a respite in military operations.¹⁰ It was a period of rest, peace and negotiations. Recalling the life of the Marathas, Modave observed: 'When the rainy season approaches, these warriors retire to their homes in army corps by separate groups.... They set about everywhere putting an abiding order in their affairs, so these will not deteriorate during the period of the new expedition for which they make themselves ready amidst these docile and pacific occupations'.¹¹

Resumption of Activities and Travel

As of the beginning of October the continental winds re-appear, bringing fair weather to the Gangetic Plain, and then onwards to the peninsular plateau. The rivers, having again become calm, are easily traversed; the earth is firm, grass grows everywhere along the roadways. India thus gradually opened itself to overland travel. The *daśa-*

camels fell into a hole and broke its back, so that one was obliged to abandon it after having removed its load... I shall say here that we made the way from *Man-dānā* to *Mukandvārā* across fields, without finding any vestige whatsoever of the beaten track, either because our guides led us astray, or because the rains had so drenched the countryside, that one could no longer discern the tracks of the road; it is impossible to have greater difficulty and make a nastier march... 8th and 9th (Sept.), the continuous rains held us back. At a half-coss from *Bhambori* there is quite a large river flowing in a deep ravine, the banks of which appear to be of slate. Two of my camels remained on the other bank of the river. The load of one was left near to the riverside. A rising of water, which occurred during the night, carried it away... the 14th we left to advance along the bank of the *Cambal*, hoping to traverse it immediately. However, the waters ran so high, the ferrymen dared not hazard the crossing. We passed the night on the right bank. We were shown a place in the riverbed where the water made a whirlpool. We were told that it was the top of an extremely high rock, which was inundated, and that it would have to be uncovered, before the passage could be risked' (Modave, *Voyage*, 474, 486-7, 492-3). Further references: Ovington, *Voyage*, 81; Hodges, *Travels*, 149; Valentia, *Voyage*, vol. I, 179; Buchanan, in Martin, *Eastern India*, vol. I, 386, 558; vol. II, 286-7; Sleeman, *Rambles*, 301-2: 'All roads in India soon become watercourses'.

10. While the rains would immobilise a simple caravan, they could expose the movements of armies to a pitiful confusion. Forbes (*Oriental Memoirs*, vol. I, 399-400) has left a particularly tragic description of an entire army caught unawares by the violence of a monsoon storm on the shore of a lake: 'It requires a lively imagination to conceive the situation of 100,000 elephants, camels, horses and oxen, suddenly overwhelmed by this dreadful storm... No language can describe the wreck of a large encampment thus instantaneously destroyed and covered with water... During this dreadful night more than 200 persons and 3,000 cattle perished and the morning dawn exhibited a shocking spectacle'.

11. Modave, *Voyage*, 400.

*harā*¹² festival announced the end of diplomatic discussions, the commencement of large military campaigns. It was also the resumption of commercial traffic and *divālī* (*dīpāvalī*) 'festival of illumination' is in certain parts of India the first day of the year for the merchants, who then open their new ledgers.¹³ Conversely, the south-east of India experiences its maximum rainfall between October and December, which is for this region the veritable monsoon.¹⁴

Everywhere in India the climatic conditions which prevail from the end of December to March are favourable to exchange and communications. The air is dry, the sky clear; temperatures with maximum averages in January of 20° to 27° Celsius are favourable to prolonged efforts of both man and animal, permitting of long-distance travel. Even though the diurnal variations can be considerable, from 12° to 15° Celsius, with an abrupt cooling at fall of night,¹⁵ they assured temperate conditions for the repose of caravans at the way stations.

Beginning with March and continuing until June, the vertical rays of the sun produce a rapid heating of the lower atmosphere; it is the period of intense heat; the nights are hot, the days stifling. Temperatures of from 42° to 45° Celsius are not rare in North India, and even 50° in the shade has been registered in Sindh, Rājasthān and the Pañjāb. 'I

12. This festival in honour of *Durga*, commemorating also the victory of Rāma over Rāvaṇa, was celebrated by all warrior castes, who on that day worshipped the instruments and animals utilised in combat: cannons, elephants, horses, etc. A Śivāji cult developed in Mahārāṣṭra, and he became the god of battles. The *daśa-harā* was considered to be favourable to military enterprise (Underhill, *Hindu Religious Year*, 55-8; Hobson-Jobson, 333). It is interesting to note that these ceremonies inaugurated the expeditions of the *Thag*, the notorious bandits who ravaged India during the first half of the 19th century. Leaving their peaceable villages, they gathered to invoke the goddess *Kālī* or *Bhavanī*, initiated new members of their organisation and thus gave a sacred character to their activities during the dry season (Sleeman, *Ramaseena*, 651).

13. Underhill, *Hindu Religious Year*, 55-8; Wilson, *Glossary*, 144; C.I.S.G., vol. V, A, *Malwa*, 137 and 441.

14. Ānanda Raṅga Piḷḷai (*Diary*, vol. IV, 200) noted in his diary, 10 Nov., 1747: "He (Dupleix) called me in and said, 'The rivers are going down. Have you had any news from the South?' As they are only beginning to sink, I answer, we shall not get news till tomorrow or the day after. Even now there are five or six hundred bullock loads of grain the other side of Ariyānkuppam River, and they cannot be brought over yet. 'That is true, it is still dangerous', he observed... 12 October, 1750 (*ibid.*, vol. VII, 404): The news from Ārkāṭu is as follows: the heavy rains every day, the storm and the floods in the Ceyyār River are putting Nāṣir Jāng's troops encamped this side of Kalavai to indescribable difficulty. Sānoji and Rāmachandra Rāo, who were ordered to march as an advance guard, refused as it would be dangerous and they could do nothing, and they urged that war should cease and peace be made...".

15. Jacquemont (*État politique et social*, t. II, 69), noted in March 1832, that in the Cittaur region he was indisposed by the "very great changes in temperature".

declare, without the least exaggeration, that I have been reduced by the intenseness of the heat to the last extremity; scarcely believing when I rose in the morning that I should outlive the day', wrote Bernier in 1665 from Bhīmbar, while on the Kaśmīr trail.¹⁶ These intolerable temperatures obliged the caravans to journey by night, or to set out very early in the morning, advancing until about 9 or 10 o'clock, and then to remain during the period of most intense heat in the shade of a tree or some other shelter, before taking to the route again in the evening. The stop-overs during the day were, however, not always possible, and the marching armies in particular could suffer terribly from the sun's fervour,¹⁷ as well as from the scorching winds which arose in the morning, at times even continuing on into the night.¹⁸ These 'whirlwinds of dust, very discommodious for the travellers'¹⁹ retarded considerably the journeys. They are called *piśāc*, or daemons, in the arid west; they 'advanced rapidly over the sandy plain... rolling immense torrents of burning sand giving such a density to the atmosphere that the sun, which appeared at first as red as blood, was afterwards by the gradual increase of the opacity totally eclipsed'.²⁰

However, one ventured to travel despite the heat. The emperor and the nobility hurried to leave behind the inferno of the plain, making for Kaśmīr, 'garden of eternal spring'. Merchants bustled about and the caravans hastened to arrive intact before the breaking of the monsoon, which would announce the suspension of large transactions.

16. Bernier, *Travels*, 385.

17. Vide in particular the journal of a British officer, John Pester, recounting his campaigns in North India at the beginning of the 19th century. We note here several pertinent remarks concerning the hot season of 1805: "14 April: the weather is getting dreadfully hot and many of the officers left the army on sick certificates... 20 April: this morning was excessively hot and a Quarter-Master of dragoons dropped dead from the effect of the sun... 26 April: the burning sand over which we marched this morning seemed greatly to distress the European soldiers and I remarked an increased number of elephants laden with them... 27 April: the weather was excessively hot indeed, and it was with great difficulty that we got the men to pass the numerous wells on the march containing stagnant water, which would have proved the death of many had they been suffered to drink... 24 May: dreadfully hot and the sun shone through our tents as hot as fire... 3 June: cursedly hot and many European soldiers dropped dead on the line of march. It was a melancholy procession and really the British soldiers appeared more as if they were marching a funeral party than anything else... 12 June: nights were so vilely hot... 13 June: wind and sun dreadfully hot. Several of our bearers dropped under the palanquins and we were able to go but little faster than at foot pace... 17 June: all my friends declared that the climate had changed me so materially that they scarcely recognised me" (J. Pester, *War and Sport*, 394, 396, 401, 402, 409, 413, 417, 419).

18. Vide in particular, Corbett, *The Climate and Resources of Upper India*, 2-8.

19. Modave, *Voyage*, 353.

20. Thorn, *Memoir*, 348-9; Vide also Pester, *War and Sport*, 292, 406, 410. The

The Importance of Soil Types

This overly simplified schema can be differentiated by taking into consideration the nature of the soil. The documents of the period indicate that this was a matter of concern for those who travelled. During the dry season, pack animals and even bullock carts could move along almost everywhere on the surfaces hardened by the sun; however, as soon as it would rain, the impermeable terrains became unsuitable for travel. Heyne remarked at the close of the eighteenth century that in Tamil country, the road conditions corresponded to the nature of the agriculture: 'where sugar and rice are cultivated in abundance, one can be certain that during the rainy season the roads will be narrow and bad; while the elevated and sandy terrains, which cannot be inundated, will have good roads even in this season'.²¹

Relations could also be maintained between the capital and the ports on the Gulf of Khambhāt during the monsoon by following the desert trails. A report made by the English *Company* specifies that Aḥmadābād 'has a type of soil which is suitable for winter travel and allows one to go by way of Vaḍodarā (Baḍodā) and Khambhāt at any time; whereas at Surat, one is blocked when the rains persist, without being able to go a half-mile beyond the city'.²² Tavernier, considering the two routes leading from Surat to Āgrā, states that during the monsoon the eastern route traversing the heavy and fertile soils of Mālava, furrowed as it was by numerous rivers in spate, was impracticable. That from Rājputānā, although much more hazardous at that epoch, was never closed because of its permeable soil, which did not retain the water.²³ Usually, travellers preferred to await the end of the rainy season, before embarking on the Burhānpur route. However, the merchant in haste, who having purchased his merchandise in Āgrā and needing, cost what it might, to arrive at Surat in time, did not shun the risk of travelling the western track. It was this consideration which impelled Jourdain to follow it in July 1611.²⁴ The conditions were

people of the country often suffered as much as the Europeans from the difficult climate. Thorn (*op. cit.*, 346) states that during the military campaigns a great number of *bihistī*, or bearers, died of exhaustion. Furthermore, it suffices to open a newspaper during the months of May or June to learn that hundreds of people die of sunstroke each year in the Gangetic Plain.

21. Heyne, *Tracts*, 14-5.

22. *E.F.*, 1634-36, 217, 28 April, 1636. Cf. also *Bombay Gazetteer*, vol. IV, *Ahmadabad*, 81.

23. Tavernier, *Travels*, vol. I, 31.

24. 'Wee were determined not to goe the waye wee came (via Burhānpur) because the winter was not yet ended; therefore wee went the waye of Amadauar (Aḥmadābād)' (Jourdain, *Journal*, 167).

reversed at the height of the dry season. On the steppes of Rājputānā it was difficult to find water and forage; hence, the Mālava route was preferred, as it presented significantly fewer difficulties.

Thus, the life on the road was directly related to climatic factors and had to submit above all to the constraints imposed by the rains. The temperature was of lesser import; the caravans knew to accommodate themselves and scheduled their halts to coincide with the hottest hours. Rain, on the other hand, the swelling of rivers, the furrowing of roadways, paralysed long-distance travel. Certainly, the humid monsoon could perhaps be interrupted by intervals of general dryness, sometimes quite prolonged, which momentarily revitalised local traffic; but the merchants and soldiers could not undertake long journeys, or risk finding themselves foundered on the road.

b. SPEED OF TRAVEL: DAYS ON THE ROAD

Of course, not everyone travelled at the same pace: those who were little pressed for time would content themselves to proceed during the cool hours of the morning and of the evening; others hastened, covering more lengthy stages; some even journeyed at night, accompanied by torch-bearers. And, it was necessary to reckon with the inevitable delays resultant of untoward complications, illness, accidents or lack of security. Thus, each day on the road was different from the next.

Nevertheless, other than during the season of rains, which slowed considerably communications, movements were usually effectuated with a certain regularity; and, a collation of pertinent data reveals the average rates which could normally and reasonably be attained in one day.²⁵ Even though they do not constitute a homogeneous series, we have collected here a number of figures provided by contemporaries of different periods, for they are vividly suggestive and evoke the rhythm which animated the route in times past.

The very great speeds were attained by the couriers. The private *qāsid* covered an average of 40 to 60 km daily; the express couriers could achieve 80 km and the messengers relaying at each stage, more than 100 km²⁶ (vide Figs. XXXVII and XXXVIII).

Soldiers, merchants and diverse travellers proceeded at a much slower pace. The imperial armies marched 'à la moghole',²⁷ foregoing great haste.²⁸ There did exist at the Court an official regulation speci-

25. To determine the distances covered and deduce the daily rates, we have generally used the *Tables of Distances* given by Rennell in his *Memoir* of 1792 (315-30).

26. Vide also *supra*, 222-24.

27. Bernier, *Voyage*, t. II, 199.

28. Irvine has studied this question in his book on the Mughal army (*Army*, 215-22: length of marches).

XXXVII. Transmission of dispatches by foot couriers during the Mughal period: several examples.

from	Stages to	distance covered in km	number of days	daily average in km	references
Dehli	Tattā	1,300 relay	5	260	(c. 1340) Ibn Battūtah, <i>Voyages</i> , t. III, 94
Āgrā	Ahmadābād	854 relay	5	170.8	(c. 1600) Briggs, <i>Hist. of the Rise of the Muham. Power</i> , vol. II, 173-4.
Kābul	Qandahār	508 relay	4	127	(1652) Sarkar, <i>Hist. of Aurangzeb</i> , vol. I, 91.
Dehli	Ahmadābād	976 relay	from 7 to 12	from 139.4 to 81.3	(c. 1700) <i>Mir ā-i-Ahmadī</i> (suppl.) 151.
Jamrūd	Ahmadnagar	2,240 relay	20	112	(1707), Irvine, <i>Later Mughals</i> , vol. I, 18.
Kāsm Badakhsān	Āgrā	1,878 express	31	60.5	(1528) <i>Bābur-nāma</i> , vol. II, 621
Qila'-i-zafar Badakhsān	Qandahār	928 express	11	84.3	(1528) <i>Bābur-nāma</i> , vol. II, 621.
Kāsmir	Junnar	1,600 express	20	80	(1627) Prasad, <i>Jahāngir</i> , 388, 402.
Kābul	Pešāvar	336 express	4	84	(c. 1800) Elphinstone, <i>Cābul</i> , 243.
Dehli	Maheśvar	800 express	13	61.5	(c. 1750) Sen, <i>Administrative System of the Marathas</i> , 470.
Surat	Delhi	1,209 express	from 15 to 20	from 80.6 to 60.4	(1716) Wilson, <i>Early Annals</i> , vol. II, part II, 90.
Surat	Āgrā	1,088	from 25 to 30	from 43.5 to 36.2	(1620) <i>E.F.</i> , 1618-21, 266 n. 4.
Surat	Tattā	902	20	45.1	(1636) <i>E.F.</i> , 1634-6, 152.
Surat	Macilipattanam	1,244	24	51.8	(1638) <i>E.F.</i> , 1637-41, 64.

Paṭṇā	Āgrā	870	from 11 15 to 25	from 79 58 to 34.8	(1620-1) Mundy, <i>Travels</i> , vol. II, 368.
Hugali	Bāleśvara	264	from 4 to 6	from 66 to 44	(1679) S. Master, <i>Diaries</i> , vol. II, 262, 278, 347.
Hugali	Dhākā	283	from 7 to 9	from 40.4 to 31.4	(1679) <i>Ibid.</i> , 252, 268, 281, 355.
Hugali	Paṭṇā	601	from 11 to 15	from 54.6 to 40	(1679) <i>Ibid.</i> , 272, 279, 322.
Madrās	Govā (Goā)	720	20	36	(1662), Love, <i>Vestiges of Old Madras</i> , vol. I, 198.
Madrās	Taraṅkampāti (Tranquebar)	264	5	52.8	(c. 1666) Thévenot, <i>Travels</i> , 128.
Putuccēri Pondicherry	Macilipattānamu	627	15	41.8	(1748) A. Rāṅga Pillai, <i>Diary</i> , vol. VI, 125.
Putuccēri Pondicherry	Mayyāli (Mahé)	550	12	45.8	(1746-7) <i>Ibid.</i> , vol. III, 165, 194.

XXXVIII. Postal organisation (*dāk*) of the British East India Company.

A. Foot couriers on the route: Madrās-Kalikātā, 1,760 km

period	number of days	daily average in km	references
prior to the 18th cent.	60-90	29.3-19.5	Love, <i>Vestiges of Old Madras</i> , vol. II, 136.
1712	30	58.6	<i>Ibid.</i> , vol. II, 136.
1789	19	92.6	<i>Ibid.</i> , vol. III, 344.
1796	12 ½	140.8	Misra, <i>Central Administration</i> , 433.
1824	10	176	Seely, <i>Ellora</i> , 86.
1836	7 ½	234.6	<i>Bengal Past and Present</i> , vol. XXII, 176.

B. "Dāk bearers" on the routes radiating from Kalikātā in 1813
 ("Bengal Public Consultations" 21 May, 1813, in Misra,
Central Administration, 440).

From Kalikātā to	distance covered in km	number of days	daily average in km
Bāleśvara	249	2 ½	99.6
Banāras	912	8	114
Dhākā	273	3	91
Jagannātha-Purī	468	5	93.6
Paṭnā	675	5 ½	122.7
Rājmaḥal	337	3 ½	96.2

XXXIX. Movements of Bahādur Śāh's army between November 1707 and August 1711
 (from Irvine, *Army*, 220).

Stages from	to	number of marches	number of halts	total number of days	distance covered in km	daily average (excluding halts)
Āgrā	Jaypur	20	50	70	248	12.4
Jaypur	Meṛtā	16	12	28	224	14
Meṛtā	Ajmer	14	17	31	72	5.1
Ajmer	Burhānpur	40	39	79	683	17
Burhānpur	Ḥaidarābād	61	144	205	576	9.4
Ḥaidarābād	Auraṅgābād	44	87	131	504	11.4
Auraṅgābād	Burhānpur	15	38	53	216	14.4
Burhānpur	R. Narmadā	11	17	28	115	10.4
R. Narmadā	Ajmer	50	130	180	568	11.3
Ajmer	Sonīpat	21	97	118	508	24.1

Sonapat	Thāneśvar	8	11	19	108	13.5
Thāneśvar	Sādhaurā	7	8	15	76	10.8
Sādhaurā	Lāhaur	33	200	233	352	10.6
TOTAL		340	850	1,190	4,250	12.6

fyng the daily stages of functionaries or of contingents charged with an official mission at seven *jaribī kos* (or 29 km).²⁹ In exceptional circumstances, the men could be obliged to make forced marches,³⁰ but generally over long distances one proceeded at a much slower pace. Figure XXXIX, which indicates in tabular form the movements undertaken by Bahādur Śāh's army from Āgrā to the banks of the Narmadā, then to Lāhaur, shows that the greater part of the stages covered by the soldiers varied on the average from 12 to 14 km. Irvine, after having compared a large number of itineraries followed by the Mughal sovereigns, estimated that in ordinary times the daily progress of the armies never exceeded 4½ *kos* (or 18.7 km) and that often the distance was limited to 1¼ *kos* (or 5.2 km).³¹

As regards commercial traffic, the conveyance of goods took place at a pace scarcely exceeding some 20 km a day, whichever mode of transport be considered. It is interesting to note this constant in Buchanan's studies made in Maisūru or in Bihār: they indicate always twelve miles (19.2 km), whether pertaining to bearers, pack oxen or

29. *Dastūr-al 'amal* from the beginning of the 18th century, cited by Irvine, *Army*, 216.

30. In 1758, Mīrzā Muḥammad went from Dehlī to Jalālābād (53 *kos*) in five days, being 10 *kos* or 43.2 km a day; he also returned to Dehlī in five stages. The following year he proceeded to Rahūn's *parganaḥ* in the Jālandhar *doāb* (320 km) in 12 marches, at a daily rate of 26.6 km (Irvine, *Army*, 218). Bussy, in January, 1758, was reputed to have covered the 768 km separating Rājamahēndravaramu and Aurangābād in 21 days; General Goddard in 1719 covered 480 km in 19 days; General Smith, in 1805, 1,120 km in 43 days; representing averages of 36.5, 25.2 and 26 km per day respectively (*M.D.M.*, *Kistna*, 53 n. 1). But the most celebrated exploits were achieved by Haidar 'Alī who, in 1781, covered with his soldiers 160 km in 2½ days, and by Tīpū Sultān, who in 1790, advanced with his men 100 km in 2 days: the daily average of the former was 64 km, and of the latter, 50 km (Blacker, *Memoir*, 281). It should be added that the *sikh* armies moved much more quickly than the Mughal troops: on one occasion, the distance of 452 km from Peśāvar to Lāhaur was covered in 5 days by the cavalry and in 9 days by an infantry corps, which makes a daily progression of 90 and 50 km; another time the *sikh* soldiers covered 480 km in 12 days, i.e. 40 km a day (Bajwa, *Military System of the Sikhs*, 203).

31. Irvine, *ibid.*, 220.

XL. Days on the Indian road, according to the seventeenth Century travellers.

Stages	distance covered in km	number of days	daily average in km	references and remarks
from Āgrā to Surat (via Ajmer)	1,088	35-40; 73	31-27.2; 14.9	according to Tavernier (<i>Travels</i> , vol. I, 72-3), Mundy (<i>Travels</i> , vol. II, 225-76) made with a difficult caravan the voyage in 73 days (excluding the halt in Ahmadābād).
from Āgrā to Surat (via Burhānpur)	1,228	33-37; 54	37.2-33.1; 22.7	according to Manucci (<i>Storia</i> , vol. I, 64-9) and Withington (<i>E.T.</i> , 222). Mundy (<i>op. cit.</i> , 39-65) covered this distance with a caravan in 47 days; Jourdain (<i>Journal</i> , 141-54), in 51 days, and Finch (<i>E.T.</i> , 136-46), in 54 days (excluding halts).
from Āgrā to Patnā	870	25-29; 35; 44	34.8-30; 24.8; 19.7	according to Tavernier (<i>op. cit.</i> , 92-9) and Manrique (<i>Travels</i> , vol. II, 145). A caravan usually took 35 days (<i>E.F.</i> , 1618-21, 191, 199, 212). Mundy (<i>op. cit.</i> , 78-187) covered this distance during the rains in 44 days.
from Āgrā to Lāhaur	827	20-22; 24	41.3-37.5; 34.4	according to Coryat (<i>E.T.</i> , 244), Steel (<i>Purchas</i> , vol. IV, 267-8) and Manrique (<i>op. cit.</i> , 179-84). Finch (<i>E.T.</i> , 155-60) covered this distance with a caravan in 24 days.
from Lāhaur to Kābul	734	20-25; 29	36.7-29.3; 25.3	according to de Laet (<i>De Imperio</i> , 55-6) and Tavernier (<i>op. cit.</i> , 76-7). Finch (<i>E.T.</i> , 167-8) indicates 29 days.
from Kābul to Qandahār	508	24	21.1	according to Tavernier (<i>op. cit.</i> , 74).
from Haidarābād to Surat	920	27-32; 36	34-28.7; 25.5	according to Tavernier (<i>op. cit.</i> , 116-20); Thévenot (<i>Travels</i> , 102, 112), who made the journey with two carts, took 36 days.
from Haidarābād to Govā (Goā)	665	17-22	39.1-30.2; 30.2	according to Tavernier (<i>op. cit.</i> , 146) Carré (<i>Travels</i> , vol. I, 221-70; vol. II, 317-26).

carts.³² This synchronisation of transport modes would reflect a tacit local regulation, probably corresponding to the rhythm of caravans and to the distance between resting places. It is also an expression of the slowness of communications in general.

The conveyance of travellers by palanquin, saddled mount, or by cart, was evidently more rapid. But the maximum speeds (60 km a day) were not common, because one necessarily had to adapt oneself to the slower rhythm of pack animals utilised to transport baggage. Thus, the observers of the period estimated the length of a day on the road, for the ordinary traveller, at 35 or 40 km.³³ The table (Fig. XL), which we have compiled from the information provided by the seventeenth century European travellers, confirms these facts. It also indicates that the greatest daily distances were achieved on the route from Āgrā to Lāhaur, which was then the best maintained route in Hindusthān, upon which travellers with light loads covered on the average some 40 km and over which trade caravans could cover more than 30 km. These statistical documents must, however, be interpreted cautiously; they have only significance if one reckons with the factors of variation which were imposed not alone by the elements, but also by the animal and human motor itself, which does not function mechanically and requires periods of rest so as to reconstitute its energy reserves.³⁴

32. Buchanan, *Journey*, vol. I, 142; Martin, *Eastern India*, vol. I, 387; vol. II, 1016; vol. III, 120, 319.

33. Tavernier, *Travels*, vol. I, 37; Thévenot, *Voyage*, 152; Perrin, *Voyage*, vol. I, 104; Forbes, *Oriental Memoirs*, vol. II, 184; Buchanan, in Martin, *Eastern India*, vol. III, 118-9. Rennell (*Memoir* (1792), 317) considered that an ordinary traveller covered an average of 22 miles, or 35 km, a day.

34. Men and animals had to in fact periodically make halt; but, each time that they took a day of rest, the average speed of their advance was reduced. Thus, in 1785, Crusot and Malet required 55 days (including halts) to make the journey on horse from Surat to Āgrā via Vaḍodarā (Barodā) and Ujjain; a particularly difficult route (Forbes, *Oriental Memoirs*, 1813 edition, vol. IV, 5-37). If the distance as estimated by the travellers (1,017 km) is correct, that would result in a daily average of only 18.4 km!

Conclusion

The uncertainty pertaining to the pace of travel indicates to which extent the distances were insufficiently mastered. Vastness dictated long durations of travel, and one had become accustomed to the slowness of land transport, as well as to the low carrying capacities. In the proximity of the sea, or on the plains of the Gaṅgā and the Indus, it was possible to avail of the waterways, which substantially complemented land traffic, especially in the case of heavy transports. The waterways cannot be dissociated from the roadways to which they were closely linked. The study of these will constitute the subject matter of the second volume of the present work.

APPENDIX

Itinerary Measures

The 'metrological' facts in India extend to remotest antiquity, as is evidenced by literary and epigraphic documents, and have not over the course of the years been subject to significant variations. Like other measures of dimension, the itinerary measures were numerous, the terms of designation diverse; without, for all of that, the same expression having corresponded to identical values. Moreover, distance was evaluated, at least originally, according to either the range of certain cries (of man or animal), or the effort expended to span a given distance. Thus, *krośa* (Skt.) — whence is derived *kos* (H.) — signifies 'call', 'cry', 'range of voice', i.e. the distance at which the cry of a man could be heard; just as *gau* (H.) or *gāvada* (Kan.) means: as far as the cow's lowing can be heard,¹ and *parugu* (Tel.): the distance a man can run at a single stretch.²

It is therefore not surprising that the terminology of itinerary measures would often be identical with those pertaining to times. As Father Coeurdoux wrote:³

Nothing was more natural than to apply the division of time to that of space; hence the ancient Indians did so. Taking the terms of the Tamil language as example, they count by 'naligui' (*nāLikai*) of road, as they reckon by 'naligui' of time. Continuing the analogy, from seven 'naligui' and a half of time, they make a great league, the measure of which is the march of a man walking neither too quickly nor too slowly in the period of one night watch; but with this difference, that night-watch is called 'jāman' (*cāmam*) and the great league 'cādam' (*kātam*), whereas the short hour and the short league have the same name, 'naligui'. Moreover, this manner of measuring space by means of time is not entirely foreign, since we also sometimes reckon by hours and days of road.

This terminology generally clouds with ambiguity the evaluation of

1. In the forests of Śrī Lanka, distance is estimated on the basis of the range of a dog's or cock's call; barking = $\frac{1}{4}$ mile; cock's crow = a bit more than $\frac{1}{4}$ mile (Tennent, *Ceylon*, vol. II, 582).

2. The units of measure on the Makrān coast corresponded to the distance covered at a single stretch by a laden camel or a horse (D.G. Bal, *Makran*, 1907, 215).

3. *Lettres édifiantes*, t. XV, 140-1. Same observation in Buchanan, *Journey*, vol. I, 416-7, 437.

units of measure. 'But in which country might the people pride themselves to speak with precision when it comes to leagues and roadways?'

*Itinerary measures in the Deccan*⁵

In the Deccan, one thus counted in terms of road hour (= 24 minutes), *ghaṭī* or *nāḍī* (Skt.), *nāLikai* (Tam.), *ghaḷige* (Kan.), *ghaḍiya* (Tel.), *ghaḍī* (Mar.), or in terms of 7½ hours of road, *kātam* (Tam.), *gāvada* (Kan.), *āmaḍa* (Tel.), *gau* (H., Mar.); however, the value of the base unit or its multiples sometimes varied according to region.

(a) in Tamil country

- 1 *nāLikai* = 3/8 of one common French league, according to Coeurdoux (*op. cit.*, 142); according to Buchanan (*Journey*, vol. I, 416-7), it was this which the Europeans in Madras called *Malabar mile*, probably corresponding to what Rennell terms *Carnatic kos*.
- 1 *kātam* = 3 common French leagues, according to Coeurdoux (*op. cit.*, 142); from 5 to 10 miles, according to *M.G.*, 150.

(b) in Kannaḍa country

- 1 *ghaḷige* = 1 *nāLikai* (*supra*).
- 1 *haradāri* = 2 *ghaḷige*, according to Coeurdoux (*op. cit.*, 145); 1 *sultānī kos*, according to Buchanan (*Journey*, vol. I, 437); 2½ miles, according to Wilson (*Glossary*, 200).
- 1 *gāvada* = 4 *haradāri*, according to Coeurdoux (*op. cit.*, 145); between 8 and 10 miles, according to Wilson (*Glossary*, 171); 10 miles, according to *M.G.* (54).

(c) in Telugu country

- 1 *ghaḍiya* = 1 *nāLikai* (*supra*).
- 1 *parugu* = 1 *kos*, according to Coeurdoux (*op. cit.*, 146); 1½ miles, according to *M.G.* (655).
- 1 *āmaḍa* = 4 *parugu*, according to Coeurdoux (*op. cit.*, 146); 10 miles, according to *M.G.* (54).

(d) in Maratha country and Gujarāt

- 1 *ghaḍī* or *ghaṭikā* = 1 *nāLikai* (*supra*).
- 1 *kos* = 2 *ghaḍī*; 1 common French league, according to Coeurdoux (*op. cit.*, 151-2).
- 1 *gau* = 4 *kos* or 4 leagues, according to Coeurdoux (*op. cit.*, 151-2); this is probably the *gokoṣ* mentioned in *Ā'in-i-Akbarī* (vol. II, 417) for Gujarāt, and listed by Molesworth in his Marāṭhī dictionary. According to Tavernier (*Travels*, chpts. XII, XVIII), it was the unit of measure used from Surat to Govā and equalled 4 *kos* or 4 leagues, i.e. 8 or 9 miles.⁶

4. *Ibid.*, 145.

5. Table based on Father Coeurdoux's letter, 'On measures in common use in Eastern India, Pondicherry, 12 Feb. 1760', in *Lettres édifiantes*, t. XV, 139-58.

However, as one more nearly approached Hindusthān, these terms were progressively replaced by the *kos*:

Advancing towards the northernmost part of Carnatic, one still speaks in terms of 'amada', but the designation 'ghadia' is no longer used to express the short hour, which, as we have said, corresponds to 24 minutes; one uses here the word *kos* when speaking of the road. I see no other reason for this change of expression, or perhaps even of itinerary measure itself, than the greater association with the Moors to whom this country is immediately subjugated. The masters of the country speak incessantly of *kos*, the people have more-or-less accustomed themselves to their manner of expression; and, in adopting this term as well as several others from the Hindusthan language, they have as if forgotten the word peculiar to their mother language.⁷

This ancient measure, however, attired very diverse units of measure.

Variations in the Length of the kos in Hindusthān⁸

It has been observed that in effect the length of the *kos* diminished in the northern plains from Orīsā to the Pañjāb, that inversely, it increased from the Gulf of Khambhāt to the valley of the Gaṅgā, and that it was finally the longest in the centre of the peninsula.

(a) *in the northern plains*

- in Orīsā = $2\frac{3}{4}$ or 3 miles, according to Marshall (*Notes*, 62, 64).
- in Baṅgāl = $2\frac{1}{4}$ miles, according to Marshall (*Notes*, 65); more than 2 miles, according to Beames (*Memoir*, vol. II, 196).
- in the Pañjāb = $1\frac{1}{2}$ miles, according to Hodge (*Travels*, 110); $1\frac{1}{2}$ or $1\frac{1}{3}$ miles, according to Beames (*Memoir*, *ibid.*, 196).

(b) *between Khambhāt and the Gaṅgā*

- from Surat to Siddhapur (Gujarāt) and from Surat to Burhānpur (Khandeś) = $1\frac{1}{4}$ miles, according to Mundy (*Travels*, vol. II, 66, 272).
- from Siddhapur to Āgrā and from Burhānpur to Āgrā = $1\frac{1}{2}$ miles, according to Mundy (*ibid.*, 66, 272).

(c) *in the central region of the peninsula*

- *gonḍī kos* = 300 paces, according to Law de Lauriston (*Memoire*, 515);

6. It will be observed that other than in Tamil country, the great Indian league was in fact considered to be equivalent to 8 small leagues (*ghaḷige*, *ghaḍiya*, *ghaḍī*), and not to $7\frac{1}{2}$.

7. Coeurdoux, *Lettres édifiantes*, t. XV, 147.

8. Vide J. Beames, *Memoirs*, vol. II, 194-6 (Elliot, *Glossary*); E. Thomas, *Essays on Indian Antiquities*, vol. II, 122-30; Wilson, *Glossary*, 294-5; Raverty, *Notes on Afghanistan*, 1 and 2 n.: the *kuroh*; Habib, *Agrarian System*, 353-62 (*Measures of land*); *History of Road Development*, 26-30 (*Measures of Distance in Ancient and Medieval India*); finally, we have also broached this question in our *Recherches*, 74-81.

4 or 5 miles, according to Colebrooke (*Narrative*, 29); 4 miles, according to Beames (*op. cit.*, 196); it equalled 4 miles in the Bālāghāt district (*C.P.D.G.*, *Balaghat*, 204), 2½ or 3 miles in the Bilāspur district (*C.P.D.G.*, *Bilaspur*, 168), 3 miles in the district of Rāypur (base unit: 1 *hānk*, 'as far as a man's voice can be heard' = 6 furlongs; 1 *dhāp*, 'as far as a man can march without being winded' = 2 *hānk* or 1½ miles; 1 *kos* = 2 *dhāp* or 3 miles) (*C.P.D.G.*, *Raipur*, 179-80).

These variations were reflected in the vocabulary used by the wayfarers. The European travellers reckoned in *great kos* or *small, long* or *short*, or in *common kos*. The inhabitants of the country often distinguished between *pakkā* and *kaccā kos* (the former having generally the twofold value of the latter), in Gorakhpur, Bihār, the length of the *kaccā kos* was, according to Beames,⁹ one mile, and sometimes less. One spoke also of the *rasamī kos*, which corresponded probably to the travellers' *short kos*, and the value of which varied regionally; it equalled 1½ miles in North-West India.¹⁰ The roads in Hindusthān were measured, except during the period which extended from Akbar's reform to the end of Aurangzeb's reign, in *hindūstānī kos* or *common kos*, which was 1½ miles in length, according to Rennell,¹¹ or one mile and 7 furlongs according to Wilford.¹²

These measures, so very diverse at the local level, had nonetheless a stable value. The variations of the units which have been constated seem to have been only of political origin.

Reforms of Akbar and Šāhjahān: Kuroh-i-Pādšāhī or Jarībī Kos

Akbar and Šāhjahān attempted to achieve a uniformity of measures on the basis of new units.¹³ These royal *kos* (*kuroh-i-Pādšāhī*), measured in *jarīb*, following official instructions, were also called *jarībī kos*. According to Habib,¹⁴ Šāhjahān's *kos* corresponded to the average distance measured by Elliot between the *kos-mīnār* of the Dehlī region: 2 miles 3 furlongs 158 yards¹⁵ — which poses a problem. For, if one

9. *Op. cit.*, 196.

10. Wilford, *J.A.S.B.*, vol. XX, 1851, 246; Irvine, *Army*, 217.

11. Rennell, *Memoir*, 4.

12. Wilford, *J.A.S.B.*, vol. XX, 1851, 246.

13. The most recent clarification has been made by Habib, *Agrarian System*, 353-62: the basic unit was the *gaz*, termed sometimes *zirā'* or *dīrā'h*. The *kos* was formed of a certain number of *tanab* or of *jarīb*, themselves multiples of the *gaz*. Its value was thus dependent on the base unit. Until Akbar's reign, one used the *gaz-i-Ilāhī*, which equalled 32 or 32.5 inches; beginning with Šāhjahān's reign until at least the end of Aurangzeb's reign, one used the *zirā'-i-Pādšāhī*, having a value of 32.808 inches.

14. Habib, *ibid.*, 362.

15. According to Rennell (*Memoir*, 4), the length of the royal *kos* was 2 miles 5 furlongs under Akbar, and 2 miles 6 furlongs from Šāhjahān onwards.

gives credence to literary sources, the *kos-mīnār* between Dehlī and Āgrā would have been installed by Jahāngir (*vide supra*, 158-59) prior to the reform of his son. The question is indeed far from having been resolved. We are unaware of the exact course of the imperial highway between the different *mīnār*; it probably followed the irregularities of the terrain and described curves. According to Elliot, the distance between the markers in the vicinity of Dehlī varied from 2 miles 3 furlongs to 2 miles 5 furlongs. Is this same variation to be found on the other roads radiating around Āgrā? The study by the Archaeological Survey concerning the *kos-mīnār*¹⁶ indicates in several instances *mīnār* on the road from Ajmer to Āgrā located at 2¼ miles from the preceeding; between Āgrā and Fatehpur Sikrī, from mile 9 to mile 15, we note, if our calculations are correct, 1 mile 5 furlongs, 1 mile 6 furlongs, 2 miles 3 furlongs between the *mīnār*. On the route from Āgrā to Lāhaur, before arriving at Dehlī, distances of 2 miles 5 furlongs and 2¼ miles have been found; in the Karnāl region, a distance of 3 miles, and nearer to Lāhaur distances which vary from between less than 2 miles and 2¼ miles. Apparently, it is between Āgrā and Karnāl that the markers most distant from one another were found (?). When all is said and done, it must be admitted that, to be fruitful, the study of the *kos-mīnār* must be made the object of a much more systematic investigation.

16. *Ann. Progress Report*, 1914, 45-51.

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