

SOUTHERN RAILWAY

A Saga of 150 Glorious Years

1852 - 2003

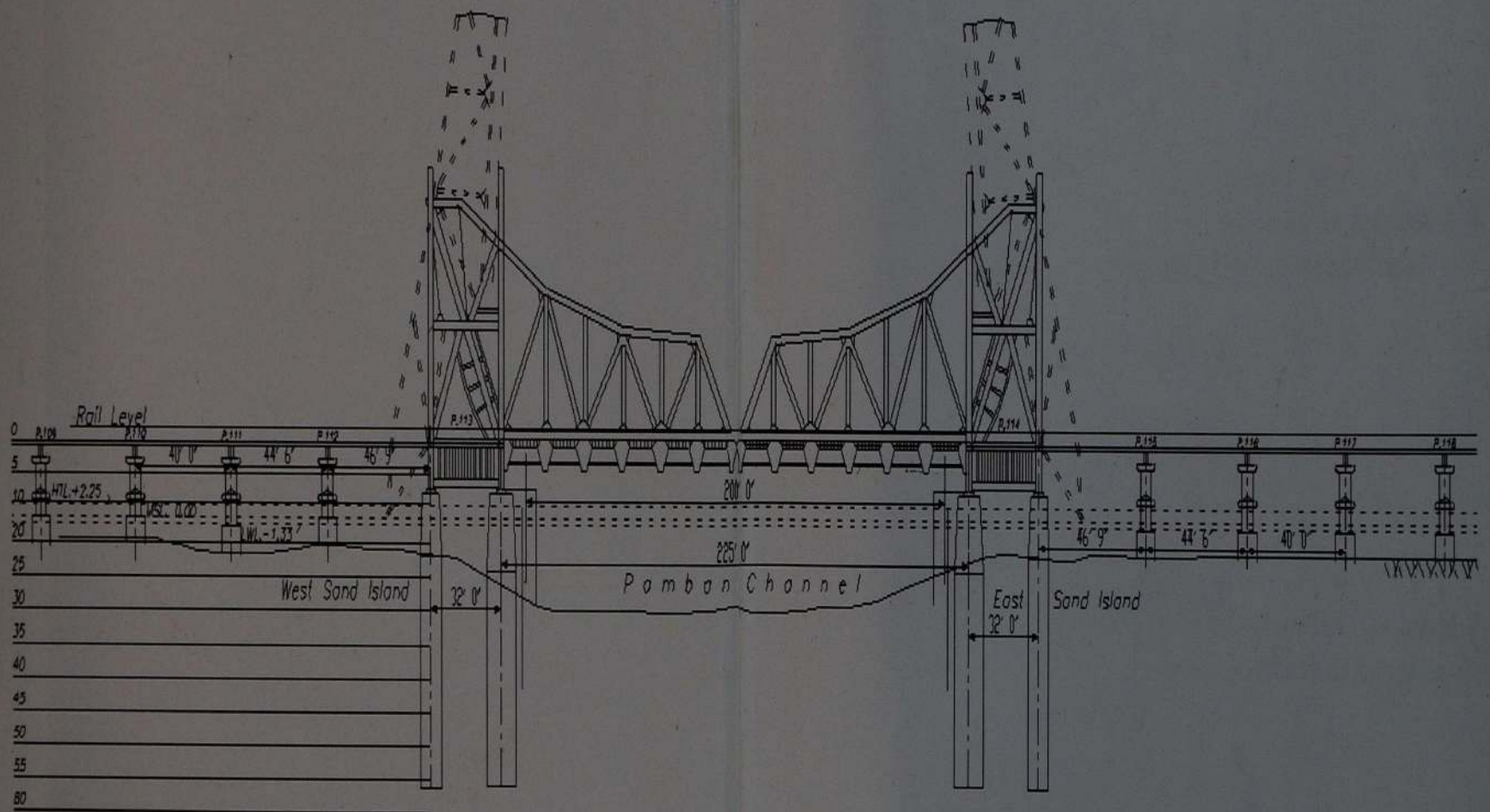
R.R. Bhandari



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With a Foreword by V. Anand

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The Scherzer Rolling Lift Bridge at Pamban, Rameswaram

The Pamban viaduct 6,676 feet long is crossed by 143 spans of 40 feet each and one of 43 feet and one of 44 feet. There are 113 spans on the west-side and 32 spans on the east-side of the Pamban channel. The Pamban channel is spanned with a two-leaf Scherzer Rolling Lift Bridge, 289 feet between the piers, leaving a clear way of 200 feet wide and 14 feet deep. The bridge was designed by the Scherzer Rolling Lift Bridge Company of Chicago and was constructed by Head, Wrightson & Co. Ltd. of Thornaby-on-Tees. The Bridge serves the needs of 2003, even 90 years after its construction.

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SOUTHERN RAILWAY

A Saga of 150 Glorious Years

(1852-2003)

Presented by

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STATION MANAGER, S.Rly.

CHENNAI EGMORE - RS.

[Signature]
11/03/04
R. R. BHANDARI

With a Foreword by **V. ANAND**

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Madras Egmore Railway Station, as built by South Indian Railway in 1906



1. Foreword

Southern Railway was formed with the merger of the Madras and Southern Mahratta Railway, South Indian Railway and the Mysore State Railways. This was the first integrated railway to be formed after independence.

The integration of dozens of railways into six zonal railways was no less a momentous event than the integration of the hundreds of princely states into the Union of India.

When I joined the Indian Railways as Special Class Apprentice in 1963, Southern Railway was the biggest zonal railway, stretching from Visakhapatnam in the East to Pune in the West and Trivandrum in the South. It had eight divisions. In 1966, with the formation of South Central Railway, the Southern Railway lost Hubli and Vijayawada Divisions and later Guntakal Division.

Much to the surprise of my superiors, I opted for the not so glamorous Southern Railway due to personal reasons. In those days, there was a policy that a candidate will not be allotted to the railway where his hometown is situated. Since I had indicated that Shimla, where I grew up, was my hometown, there was no difficulty in my being allotted to Southern Railway.

Southern Railway is truly an example of unity in diversity. The climatic conditions, language, dress and customs vary in different states; but each constituent railway had its own distinct flavour which transcended barriers of state and language. The South Indian Railway was affectionately known as the "Sambar Idli Railway" and often criticised for its strict adherence to rules and regulations. Madras and Southern Mahratta Railway referred to as the "Mails in Slow Motion Railway" had a different approach in its work culture, permitting more independence of action especially at the supervisory level and a rather less reverential and more pragmatic approach to rules and procedures.

Officers posted to Southern Railway received training in Divisions of both the Madras and Southern Mahratta Railway portion as well as the South Indian Railway. The difference in management culture was evident even in the layout of the Workshops and Sheds and the Stores procedures. Mysore State Railway was regarded with a benign or even patronising air since not much was expected in terms of movement of freight or passengers. The work culture was accordingly a little laid back. Over the years these cultures have affected one another and the erstwhile Mysore State Railway, now a part of South Western Railway, throbs with activity and the Mysore Workshop has reinvented itself to be one of the best on the Indian Railways.

In sum, the work culture of Southern Railway is an amalgam of the intellectual prowess of the Tamils, the enterprise of the Malayalees, the hard work of the Andhrites and the sweet reasonableness of the Kannadikas.

Whatever the work culture, both Madras and Southern Mahratta Railway and the South Indian Railway had a common goal of rendering the best service to their customers and performing railway activities with maximum economy.

Though they might have been considered poor cousins of the glamorous Great Indian Peninsula Railway and East Indian Railway, they were second to none in innovations and introduction of new technology. The South Indian Railway was perhaps the first to introduce multiple aspect upper quadrant signalling on MG system which was considered a safer system than the existing two aspect signalling system. The South Indian Railway reduced the number of signalling posts by invoking a rule which provides that a single distant signal and a single home signal were sufficient conditions for safe operation provided the maximum speed was 75 kmph. Thus the entire main line section from Villupuram to Tiruchchirappalli was provided with the then state of the art of multiple aspect signalling at a most economical cost.

Fuel economy was an article of faith. South Indian Railways used Bengal seaborne coal unloaded at the Port of Nagapattinam. Even the locomotive links were arranged such that the movement of coal in wagons was minimised. Another innovation was the oil fired boilers of locomotives on the BG system in Olavakkot Division.

The Southern Railway completed 50 years of its existence in the year 2001. It has been completely transformed in these 50 years. New BG lines have been laid from Tirunelveli to Trivandrum via Nagercoil and connecting Kanniyakumari. Dindigul has been linked to Karur by a Broad Gauge line. Alleppey has been brought on the Railway map with the connection of Kayankulam to Ernakulam. The Holy Shrine of Guruvayur has been connected to Thrissur.

When I was a child, the journey from my ancestral village near Ottapalam to my maternal grand parents' house at Trivandrum involved a train journey from Ottapalam to Mattancheri where one got into a slow ferry boat which took all night to reach Alleppey. From Alleppey, it was a four hours' bus ride to Trivandrum. Till then the Broad Gauge line terminated at Cochin and the nearest railhead was Kollam. Post independence, these towns were connected by a MG line subsequently converted to BG.

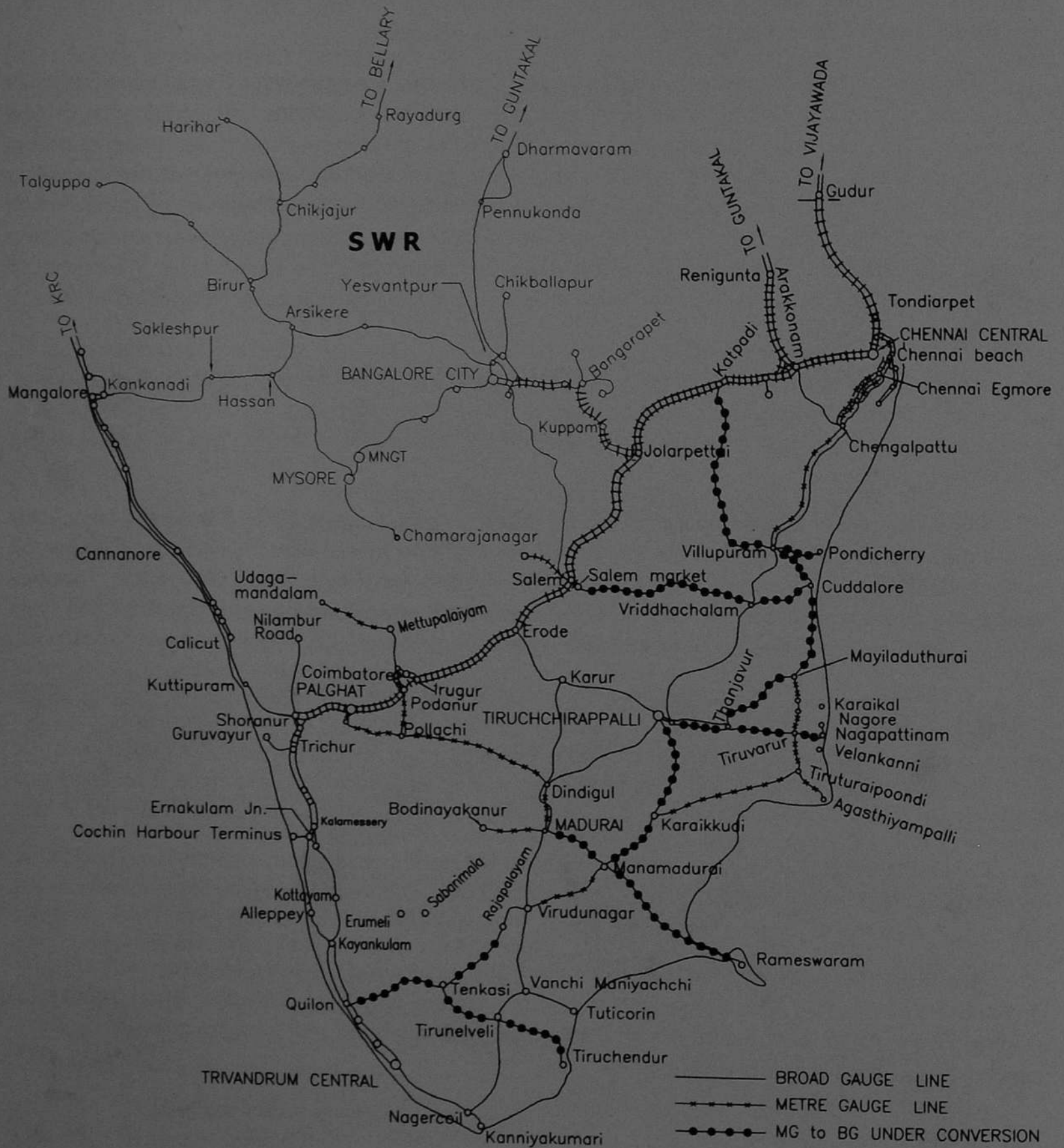
Except in the Nilgiri Mountain Railway, we have bid good bye to steam locomotives. Though the railway has suffered two partitions, its management and work culture are dedicated to innovations and service to the customer as expressed in the motto "We care".

This definitive work on the History of the Southern Railway is the 15th book authored by Shri R.R. Bhandari. It is a notable addition to the literature on Indian Railways. The scholarship, erudition and meticulous research which has gone into this book make for compelling reading both by Railway enthusiasts and laymen.

V. ANAND

General Manager
Southern Railway

SOUTHERN RAILWAY



2. Introduction

In the year 1600, Queen Elizabeth granted a charter to the London East India Company under the title of "The Governor and Company of Merchants of London Trading into the East Indies". During the next two hundred years, seven subsequent charters were granted, the Company became known as "the Honourable East India Company" and a patchwork government based on the Presidencies of Bengal, Bombay and Madras was established. The Merchants of London transformed themselves into the greatest rulers of the world controlling the destiny of one fifth of the humanity.

However, British India was an unsatisfactory business place for the merchants and manufacturers of Victorian era. The trade was meagre; it needed introduction of two of the principal achievements of the industrial revolution – the steam ship and the steam railway. Systematic efforts to obtain Government support for shipping lines began in 1820s, reached its climax in late 1830s and regular services of the Peninsular and Oriental Steam Navigation Company (P&O) commenced in early 1840s with annual subsidies from the British Government and the East India Company.

Active campaigning for railways in India began soon after the success of the P&O Company. Rowland Macdonald Stephenson, promoter of the East Indian Railway (EIR) Company submitted his first proposal for the construction of rail lines in 1844. He outlined six major rail routes for the Indian sub-continent. Stephenson's efforts from 1844 to 1849 resulted in financial guarantee and liberal government support for early railway companies. The EIR Company and the Great Indian Peninsular Railway (GIP) Company were formed in 1849; they pioneered construction of rail-lines originating from Calcutta and Bombay.

Lord Dalhousie, in a minute dated 20.04.1853, explained his reason for preferring the agency of companies, under the supervision and control of the Government, to the construction of lines on behalf of the Government by its own officers. He held that government engineering officers would make the railways as well and possibly as cheaply and as expeditiously as companies; but that the withdrawal from other duties of large number of engineering officers required would be detrimental to the public interest and that the conduct of commercial undertakings did not fall within the proper functions of any government and least of all within the functions of the Government of India.

The policy forwarded by Lord Dalhousie was adopted most vigorously; between 1850 and 1860, contracts for the construction of the Railways in India were made with many companies. Under these contracts the Railway Companies undertook to construct and manage specified lines while the Government of India agreed to provide land free of any charge and guaranteed interest on the capital, the rate fixed being 5 to 4.5%. Half of any surplus profit earned was to be used towards repaying to the Government in sums by which it had been called upon to supplement the net earning of any previous period in order to make good the guarantee of interest and the remainder was to belong to the share-holders.

Lord Dalhousie recommended that in the first instance, a system of trunk lines should be formed to connect interior of each Presidency with its principal port and then the several Presidencies with each other. The trunk lines proposed were—

- a) a line from Calcutta to Lahore;
- b) a line from Bombay to some point in North or alternatively a line by the Narmada valley to meet at some point, the line from Calcutta to Lahore;



- c) a line from Bombay to Madras;
- d) a line from Madras to Malabar coast.

It is interesting that there was no provision of any railway line for joining Calcutta and Madras and also no line passing through the heart of Indian sub-continent viz., traversing Nagpur and south eastern region of the Indian peninsula. Perhaps these lines were not important for meeting the prime objects outlined by Lord Dalhousie, viz.,

1) To immensely increase the striking power of its military forces at every point of the Indian Empire.

2) To bring British capital and enterprise to India.

3) To secure commercial and social advantages to India which were "beyond all present calculation" especially -

- ♦ to carry away the produce which great tracts in India were teeming with but could not dispose of;
- ♦ to increase the production of cotton which England was calling aloud for its mills;
- ♦ to spread articles of European produce "in the most distant markets of India" and "beyond our present frontier";
- ♦ to bring into the ports produce from the interior for ships which from every part of the world crowd our ports in search of produce.

Madras, the headquarters and focal point of Madras Presidency suited well with the dictums of Lord Dalhousie and was an important point for meeting the prime objectives of Railways as thought by the rulers of Victorian era.

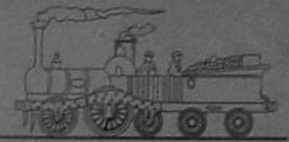
The very first proposal for Railways dates back to 1832, for rail-lines in the Presidency of Madras. The early proposals for the rail lines are covered in Chapter 3. Very soon lines emerged out of Madras through the agency of

Madras Railway Company. These rail lines could be divided into two major routes viz., South West line and North West line. These have been covered in Chapters 4 & 5.

Great Southern of India Railway Company was established in 1859. Five years later in 1864, Indian Tramway Company was established for constructing branch lines. These two Companies started construction of rail lines in southern part of Madras Presidency. Indian Tramway Company soon changed hands and rechristened into "Carnatic Railway Company Limited". Financial problems forced these two railway companies to merge into the "South Indian Railway Company". South Indian Railway (SIR) chose metre gauge for economy. Evolution of metre gauge is covered in Chapter 6. SIR became a major player in construction of rail lines in the southern part of Madras Presidency and is covered in two Chapters, Chapter 7 covering the period from 1859 to 1907 and Chapter 12 covering the period from 1908 to 1951.

It was not long before the defects of the guarantee system began to show themselves. It was found that the guarantee had been fixed at too high a rate, which deprived the company of all incentives of economy in construction. It was felt that the greater the amount spent, the greater would be the amount of profit. The guaranteed rate was more than the market rate of interest.

The prospects of a surplus above the guaranteed minimum were considered to be too remote to induce economy. There was no limit placed on the amount of investment in Railways and hence to the liabilities to which the Government might be led were unlimited. Right Hon'ble W.N. Messey, who had been a Finance Member under the regime of Lords Lawrence and Mayo, remarked in 1872, "The East Indian Railway cost far more if not twice as much as it



ought to have cost ". There was a general uproar from 1864 to 1868 against the guaranteed railway companies who were inclined to do everything *a la-grand*, which would enable them " to do something worthy of Brunel or Stephenson ".

To quote C.H.G. Jenkinson, an Assistant Engineer of Western Rajputana State Railway from his writing of September 1873:

"Ask why all the Indian Railways have on an average cost enormous sums, out of all proportions to the wealth of the country. They traverse on exceptionally plain country for the greater part of their length and the average of heavy works on them cannot be said to be exceptionally high. Is the reason this that the proprietors of the lines and their servants have not sufficient interest in the country, and because the former, living in England and never thinking of their property, except to receive 5 per cent on it when it becomes due; the latter only of their pay, thus contemplating only a short residence in the country, do not consult the best interest of the inhabitants for doing what the public servants of this country have ever been justly famed?

This accusation is not to be denied, and no one can have travelled far in this country by railway without remarking the profuse liberality with which money has been spent, without the smallest regard to the wants of the country, or indeed to the habits of the natives. The Government therefore, has been wise to undertake the construction of new lines itself, and to entrust the work to men who look forward to a lengthened residence in India, and who can hardly help in a measure identifying themselves with the interests of the country they have adopted for the best years of their lives."

What are the functions of the State or the Government? Some strongly believe that there are four and only four functions of the State,

viz., Defence, Law and Order, Judiciary and Revenue, and NO MORE, "I hold", said Lord Dalhousie "that the creation of great public works, although they serve important purposes of State, and are mainly intended to be used in those multifarious operations which the enterprise, the trade, and the interests of the community forever keep in motion, is no part of the proper business of the Government." Debate goes on and the division of views is as wide as it was one and a half-century ago.

First resentment to Dalhousie's theory of Private Enterprise was expressed by Sir J. P. Grant, the President of Viceroy's Council on May 5, 1857, shortly after the departure of Dalhousie:

"My conviction that the control of the Government has been in a great measure instrumental in bringing about the success of the lines now opened has been already stated. But although this control is an essential part of the present system and without it a guarantee system is impossible, the double management is a great evil. The necessity of submitting to so great an evil is the vice of the system."

After a few years of experience, the Government of India itself began to doubt whether their power of control over the guaranteed Companies secured possible economy in construction. The wordings of the contract were uncertain and contradictory, leading to interpretations more advantageous to the Companies. It was felt that as a result of inactive, uneconomical and unenergetic management, construction of railroads in India had become more extravagant. The views of the Government underwent a serious change from 1858 to 1868. Frank and open declaration was made in a minute dated January 9, 1869, by Lord Lawrence. In this Minute, which has passed the posterity as one of the most able statements of the case for direct construction by the State,



Lord Lawrence (or perhaps Sir Richard Strachey, who later confessed that he was the author of this minute) reviewed the case from both the financial and administrative points of view and concluded that the guaranteed company system offered no peculiar advantage which could not be secured by the State agency. Referring to the objection that the prosecution of public works by the Government was an interference with private enterprise, Lord Lawrence said that it was an abuse of language to speak in that strain. He then asked:

"Is it reasonable or consistent with the true interests of India to continue a system under which the revenues have to bear the whole risk or loss and can derive no direct benefit from railway construction, in preference to one under which with a risk certainly no greater and probably much reduced, the whole of the direct profits can be added to the public revenues and made available for reducing taxation or preventing the imposition of new burdens?"

Lord Lawrence's minutes was accepted wholly by the Government of Lord Mayo, who was his successor, and it met with the full concurrence of the Secretary of State, the Duke of Argyll, whom a change in the ministry had brought to office. It was held that the considerations which induced the Government to employ the agency of the companies in earlier days had lost their strength, and the Government was at the time fully justified in securing for itself the full benefit of its credit and the cheaper methods at its command. It was decided by the Secretary of State that the time had arrived when in both raising and expending such additional capital as might be required for new lines in India, the government should secure to itself the full benefit of its own credit and of the cheaper methods, which it was expected that it would be able to use. Accordingly, for several years after 1869, the chief capital expenditure on railways

was incurred direct by the State and no fresh contracts with guaranteed Companies were made except for small extensions.

In 1880, the necessity of great and rapid extension of the railway system was urged by the Famine Commissioners, appointed after the great famine of 1878, who estimated that at least 5,000 miles were still necessary for the protection of the country from famine. It was held by the Government of the time that a limit was necessary on the capital borrowed annually; and it was clear that the limit fixed was not high enough to allow of such progress in railway construction as was desirable.

Famine Commissioners observed that, "there would be manifest advantages in giving free scope to the extension of railways by private enterprise if it were possible; and, though the original form of guarantee has been condemned, it may not be impossible to find some substitute which shall be free from its defects, and may secure the investment of capital in these undertakings without involving the Government in financial or other liabilities of an objectionable nature".

The Government of India decided to take action as suggested by the Famine Commission to again allow private companies to construct Railway lines. Three companies were formed - The Bengal Central Railway in 1881, Bengal and North Western Railway and the Rohilkhand and Kumaon Railway in 1882, without any guarantee. The Government, however, could not induce any more takers for construction of rail-lines without guarantee. A modified system was, therefore, worked out to induce private capital giving a guarantee though not that much attractive as was with the old companies. These new guaranteed companies were the Southern Mahratta Railway (SMR) in 1882, the Indian Midland Railway in 1885 and the Bengal Nagpur



Railway in 1887. The lines constructed by these three newly guaranteed companies were declared to be the property of the State, who had the right to determine the contracts at the end of 25 years after their respective dates or at subsequent intervals of 10 years, on repaying at par the capital provided by the Companies. Southern Mahratta Railway is covered in Chapter 9. At the end of 25 years of its formation, on the conclusion of the contract SMR was purchased by the State in 1907.

There was no plan to connect Calcutta & Madras either in the gorgeous scheme propounded by Lord Dalhousie or subsequent proposals. Perhaps it was felt that the traffic will not justify even a light railway system for the Coromandel Coast. Only after the extension of a rail line to Vijayawada in 1889 both by the Southern Mahratta Railway and by the Nizam's Guaranteed State Railway that serious thoughts were given for a coastal line. The State plunged into this unviable project of coastal line and formed the East Coast State Railway. The development of railway lines through the East Coast Railway is covered in Chapter 10.

Mysore State Railway remained an independent system right from its beginning. Owned and managed (excepting from 1886 to 1919) by the Maharaja of Mysore, it was one of the major railways before its amalgamation into Southern Railway in 1951. Mysore Railway is covered in chapter 8.

1st January 1908 heralded a major change in the management of rail lines in southern part of the country, consisting of 4 major railway systems viz., i) Madras Railway ii) South Indian Railway iii) Southern Mahratta Railway and iv) East Coast Railway (southern section). All these Railways were by then owned by the State viz., British Government of India. These however, excluded the Mysore Railway System owned by the Mysore Durbar. It was felt that reorganization of these four systems is very necessary. It took

place and from 1st January, 1908, two major systems emerged. Madras & Southern Mahratta Railway (MSMR) with its headquarters at Madras and South Indian Railway with its headquarters at Trichinopoly (now Tiruchchirappalli). These two systems remained intact up to 1951 and have been covered in Chapters 11 & 12 respectively.

Nilgiri Mountain Railway (NMR) is a very special Railway, covered extensively in a separate book "Nilgiri Railway" published by National Rail Museum in 2002. Chapter 14, mostly derived from this book covers Nilgiri Railway.

Narrow Gauge railway lines were peculiar; they were individualistic in their attitude both in construction and operations. They ordered locomotives specifically to cater their requirements. The Narrow Gauge lines and their locomotives have been covered in Chapter 13.

"Steam locomotive is the genius of Railway Engineering", this is an old saying and how true it is, just ask any steam enthusiast. Metre Gauge steam locomotives and Broad Gauge steam locomotives are covered in Chapters 15 & 16 respectively. Most of the material came from the books of my Guru Late Mr. H. C. Hughes, to whom I am greatly indebted.

Diesel Traction and its competitor Electric Traction have been covered in chapters 17, 18 and 19. I had written a long article "Electric Traction in India (1925-1950)" published in five serial issues of SLS journal in 1982-83. Most of the material of Chapter 18 is from that article.

On the auspicious occasion of the Tamil New Year (April 14, 1951) Southern Railway was inaugurated by His Excellency the Governor of Madras, Maharaja Sri Sri Krishnakumarasinhji Bhavsinhji in a colourful function at Madras. Shri N. Gopalaswamy Ayyangar, the then Minister for Railways and Transport was the Guest



of Honour. Southern Railway (SR) was formed by amalgamating Madras and Southern Mahratta Railway, South Indian Railway and Mysore State Railway. After divisionalization Southern Railway comprised of Hubli, Guntakal, Vijayawada, Madras (Royapuram), Tiruchchirappalli, Olavakkot, Mysore and Madurai Divisions. The area covered included the entire States of Kerala, Tamil Nadu, Karnataka and a major portion of Andhra Pradesh. It was quite an extensive railway. Alas! It could not hold to that big territory. In 1966, South Central Railway (SCR) was formed taking away the divisions of Hubli, Guntakal and Vijayawada. This process of bifurcation got a boost in the new millennium with the formation of South Western Railway (SWR) managed from Hubli. Hubli - Dharwar had seen the completion of the full circle, it was the headquarters of Southern Mahratta Railway in 1882. After 121 years, it is once again beaming up with activities of the new headquarters of South Western Railway. Southern Railway has been covered in two Chapters 20 and 21. SWR has been covered in chapter 23.

1980s and 1990s were the years to prove the correctness of Lord Dalhousie's theory of uni-gauge propounded way back in 1850. The Southern Railway converted substantial portions of MG lines to BG lines in these 20 years. The work of gauge conversion is in full swing. The gauge conversion is covered in Chapter 22. The ongoing projects are covered in Chapter 25.

A major railway system needs support of workshops. Southern Railway established major Mechanical Workshops at Perambur, Tiruchchirappalli and Mysore. A new Signal Workshop was established at Podanur in 1951, taking away the portions from the Central Shops at Golden Rock. The Engineering Workshop at Arakkonam had its roots in a makeshift workshop

at Royapuram. All these workshops have been covered in Chapter 24.

Southern Railway is concerned with preserving its rich heritage. It had established two regional museums - one at Mysore in 1982 and another in Madras in 2002. The Railway's effort in preserving its rich heritage is covered in Chapter 26.

Indo-Ceylon Connection, a reality of the yesteryears is a dream of the new millennium. How South Indian Railway provided a direct link to Ceylon is covered in Chapter 27.

Four annexure form an important part of the book. Annexure I covers 'The Cochin Forest State Railway', a unique experience of combining inclines and steam hauled trains, perhaps the only one of its kind anywhere in the world. Annexure II 'Dates of Opening' for various BG and MG sections are from the official document titled 'History of Indian Railways' published from time to time and from 'The Brief History of Railway Projects' published by Southern Railway in 2001. 'Dates of Opening' for narrow gauge sections have been mentioned in the chapter 'Narrow Gauge Lines'. Annexure III is an extract covering Railway Catering through professionals. Annexure IV gives a vivid description of a general strike of 1928 on South Indian Railway hinting that things were as volatile then.

A book of this nature has been possible only because of the help from my colleagues at all stages, the book is their own product, naming a few will not be proper. I dedicate it to all who made it possible within a very tight time schedule of one year.

R. R. BHANDARI

3. Early Proposals For Rail Lines In Madras Presidency

The first proposals for rail lines in India emerged from the Presidency of Madras in 1832, much before similar proposals for rail lines in Bengal and Bombay Presidencies. Madras (Chennai) took lead in building the very first rail-line of the Indian sub-continent. In 1836, an experimental line was laid near Chintadripet. This was followed by 3½ mile long rail-line southwest of Madras connecting Red Hills and the stone quarries near the little mount at the turn of the year 1837.

The Madras Railway Company was formed in 1845 in line with the formation of East Indian Railway Company and Great Indian Peninsular Railway Company. However, the apathy of British Government forced the promoters of Madras Railway Company to dissolve it in 1847. Despite East India Company's indifferent attitude towards the construction of railroads in the Madras Presidency, the mercantile community, elite of the society, the promoters, shareholders and above all, people of Madras pleaded for support and continued their interest and determination to see that the project takes shape. Perseverance and dedication of the people of Madras finally brought the approval of Court of Directors of East India Company on 25th May 1852. Shortly thereafter a new company with the same title Madras Railway Company was registered in London on 26th July 1852.

One hundred and fifty years have passed since that event of registration of Madras Railway Company. It is time to recapture the golden memories and salute those who took great pains in pursuing the first proposals in the formative years of 1832-52.)

First Proposal For Rail-lines In India

The Select Committee appointed by the House of Commons to enquire into the state of affairs of the East India Company and the trade between Great Britain, the East Indies and China submitted a report (dated 27th January 1832) to both Houses of British Parliament containing financial and technical details of constructing rail-roads and canals in Madras Presidency. The committee suggested that for the applicability of canals and railroads, following points need consideration:

1. The expense of constructing such works.
2. The returns, which they would make.
3. The difficulties that might be expected, considering the present state of the affairs in that country.

The committee estimated the cost of a single line as Rs.8,750 per mile in India compared to about £ 5,000 (Rs.50,000/-) a mile in England for a double line.

It was felt that there were very few lines on which there is sufficient traffic in Madras Presidency for it to be either profitable to construct works of this kind, or possible to combine the means of internal communication with those of irrigation. "The only ones that hold any prospect are, 1st, the line from the coast of Thanjavur through the towns of Kumbakonam and Tiruchchirappalli to the province of Coimbatore; 2nd, the line through Coimbatore along the irrigating channels of the Bhavani river; 3rd, that along the irrigating channels of the Noyyel, which passes directly through the centre of the same district, 4th, those of the Amravathi which skirts the south-east part of the same district; and, 5th the line from near the town of Coimbatore to the Western Coast."



First Rail Line of the Indian sub-continent

The credit for the first rail line of the Indian sub-continent goes to a small railway line near the Chintadripet Bridge in the Madras Presidency in 1836. Extracts from 'Madras Gazette' dated 4th May 1836 are reproduced below:

"A small piece of railway has been laid down near the Chintadripet Bridge, which is well worth the inspection of the good people of Madras who have not visited England since railways have become common. To show how little labour is required on a road of this description, a cart is placed upon the rails, loaded with stones, which is easily moved up a slightly inclined plane by one hand, from whence it returns by its own weight to the place from which it was first propelled."

Captain A.P. Cotton, an eminent Civil Engineer of Madras, after an inspection of localities near Madras City, expressed a confident opinion that by laying rails to the Red Hills, and to the stone-quarries at the Little Mount, substantial savings might be effected in the conveyance of materials. He recommended for surveying the lines and framing detailed estimates. His proposal was approved and orders were issued accordingly.

Captain Cotton's project was followed by the construction of an experimental line of 3½ miles southwest of Madras connecting Red Hills and the stone quarries, near Little Mount.

Madras Herald of 30th December 1837 reported thus :

" WIND-CARRIAGE RAILWAY

We had the gratification yesterday of travelling on the Red Hill Railway for two or three miles in the direction of Madras, and back again

on the same road, without the aid of any propelling power but that of the wind. A small carriage, fitted up with a rude sail, travelled at the rate of six or seven miles an hour, within six points of the wind."

Madras Railway Company: The Formative Years

The Madras Railway Company was formed in London on 8th July 1845 with the general object of constructing railroads in Madras Presidency. The first general meeting of the shareholders took place in February 1846. J.A. Arbuthnot, Chairman of the Board of Directors, solicited immediate approval of the project. Extracts from Mr. Arbuthnot's letter dated 26th November 1846, addressed to the Secretary to the Court of Directors, East India Company are reproduced below:

" On the 23rd of May last, I had the honour to address a letter to you, for the purpose of being laid before the Court of Directors, on the subject of a Company which has been formed in this country, the general object of which was the introduction of Railway communication into the Madras Territories; and its immediate object, in the first instance, the construction of a Railway between Madras, Walajahnagar, and Arcot, provided these objects should receive the sanction of the governing authorities.

The grounds upon which it is considered that the Madras and Arcot Line is entitled to the support of government are the following :-

- 1st Great facility of construction.
- 2nd A confident expectation of its proving a remunerative undertaking.
- 3rd That the risk incurred by government in guaranteeing a dividend up on it will in consequence be little more than nominal.



4th That the construction of a paying line of such moderate length, as may render its completion within a short period probably will be of the utmost importance in its bearing upon the future extension of Railway in India.

5th That the advantages to be derived by Government from this Line, both in a financial and political point of view, will far exceed those which will accrue from its construction to the share holders, as a commercial investment.

6th That the Presidency of Madras which has no means of water carriage for the transport of the produce of interior to the ports of shipment is so situated as to derive the utmost conceivable advantages from the introduction of Railways.

In conclusion, I would beg respectfully to call the attention of the Court of Directors to the fact, that this undertaking has nothing in it of the nature of a pecuniary speculation: its promoters are gentlemen, the greater number of whom, are known to the court, as connected with Madras. They have had the advantage of being joined by some gentlemen, whose practical knowledge of such business, has been of the highest value in the Council of their proceedings: their efforts in this country to promote a scheme which promises such incalculable benefits to India, have been warmly responded to, and seconded by the community of Madras. We would hope that the very moderate amount of capital required for the construction of the Madras and Arcot Line could, even now, be raised, provided a guarantee of a certain rate of interest were agreed to the share holder, on the part of the East India Company".

Secretary to the Government of India sought advice of F.W. Simms, Director of the Railway Department on the proposal of Madras Railway Company.

In spite of Mr.Simm's recommendation, Government of India did not favour reply to Madras Railway. Arbuthnot continued his efforts by reminders dated 19th January 1847 and 16th April 1847. His letters highlight the apathy of the Court of Directors in taking decisions regarding the Madras Railway Company's project.

Despite East India Company's indifferent attitude towards the construction of a railroad in the Madras Presidency, the shareholders, promoters and people of Madras continued their interest and were determined to see that the project takes shape. Arbuthnot's letter of 7th May 1848 addressed to the Secretary to the Court of Directors, East India Company is reproduced below:

"I had the honour of announcing to you that on the 8th of July 1845, a company had been formed in this country under the title of "The Madras Railway Company," the immediate object of which was to undertake, provided they should succeed in obtaining the sanction of the Honourable the Court of Directors of the East India Company, the construction of a railway from Madras to Walajahnagar and Arcot

Ulterior events, which it is unnecessary here to advert to, induced the shareholders, in compliance with the recommendation of the directors, to dissolve the company, the directors, however, being requested to retain possession of the records, which contain much useful information, in the hope that they might yet, under more favourable circumstances, be rendered available in carrying out the object for which that information had been collected.

The recent determination which has been made public, on the part of the Honourable Court of Directors, to guarantee a dividend at



the rate of five per cent per annum on certain experimental line of railway, has induced several of the gentlemen who were connected with the former undertaking to unite with other parties who take an interest in the subject, in adopting measures for the formation of a new association, having similar views and objects with those contemplated by the establishment of the Madras Railway Company.

As Chairman of two meetings which have been held for the purpose of carrying out these views, I have been requested to address you, and to submit for the consideration of the Honourable Court a copy of the proceedings of these meetings, at which the formation of a new company was resolved upon, and certain progress made in the execution of the project.

It will probably be the duty of the directors who were then appointed, to address the Honourable Court on the subject of the proposed undertaking, I will therefore, in concluding this letter, merely state, that the formation of the former company was hailed with the greatest satisfaction by the community at Madras, who lost no time in appointing a local committee for the purpose of co-operating with the directors in this country, from whom we received much valuable information, both statistical and general, entirely confirmatory of the opinions entertained by the promoters of the undertaking, that, whether in the facilities for the construction of the proposed railway, or in the inducement to it in a commercial point of view, no line could be selected throughout India which would more completely fulfil the object expressed in the Honourable "Court's communication to suggest some feasible line of moderate length as an experiment for railroad communication," than the line from Madras to Walajahnagar."

The Government of Madras, the mercantile community, and elite of the society took great initiative in building railways in the Presidency of Madras. They held a meeting on 29th May 1849 followed by a meeting on 2nd June 1849 and resolved to pursue revival of Madras Railway Company. Court of Directors declined to comply the request of Madras Railway Company for pecuniary support and informed the provisional chairman of the defunct Madras Railway Company accordingly.

Consequent on the rejection, the promoters of the Madras Railway Company again pleaded for support on the grounds of political importance and commercial necessity of railroads in Madras Presidency. In their memorandum dated 20th February 1850, the promoters suggested to undertake the project in public interest.

Two years of political lobbying with the Board of Control, East India Company and Government of Madras resulted in East India Company's approval of Madras Railway Company's proposal and guaranteed return of 4% on the capital. J.C. Melville, Secretary, Court of Directors' letter dated 25th May 1852 is reproduced below:

To
Colonel D. Sim, and
J.A. Arbuthnot, Esq.
Great St. Helen's Passage.

Gentlemen,

The Court of Directors of the East India Company having lately received from the Madras Government the information regarding a railway in that Presidency, referred to in my letter of the 7th September 1850, have had under their attentive consideration the application contained



in your letter of the 29th October last, for the concession of the construction of that railway on the same terms and conditions as have been granted for the lines of Bengal and Bombay to their respective companies.

I am now instructed to inform you that, upon being satisfied to the capability of the Madras Railway Company to raise a capital of £ 500,000, the Court will be prepared to enter into an agreement with that Company for the execution of a railway at Madras. Referring, however, to the present state of the money market, the Court are of opinion that an interest of 4 per cent upon the above mentioned capital

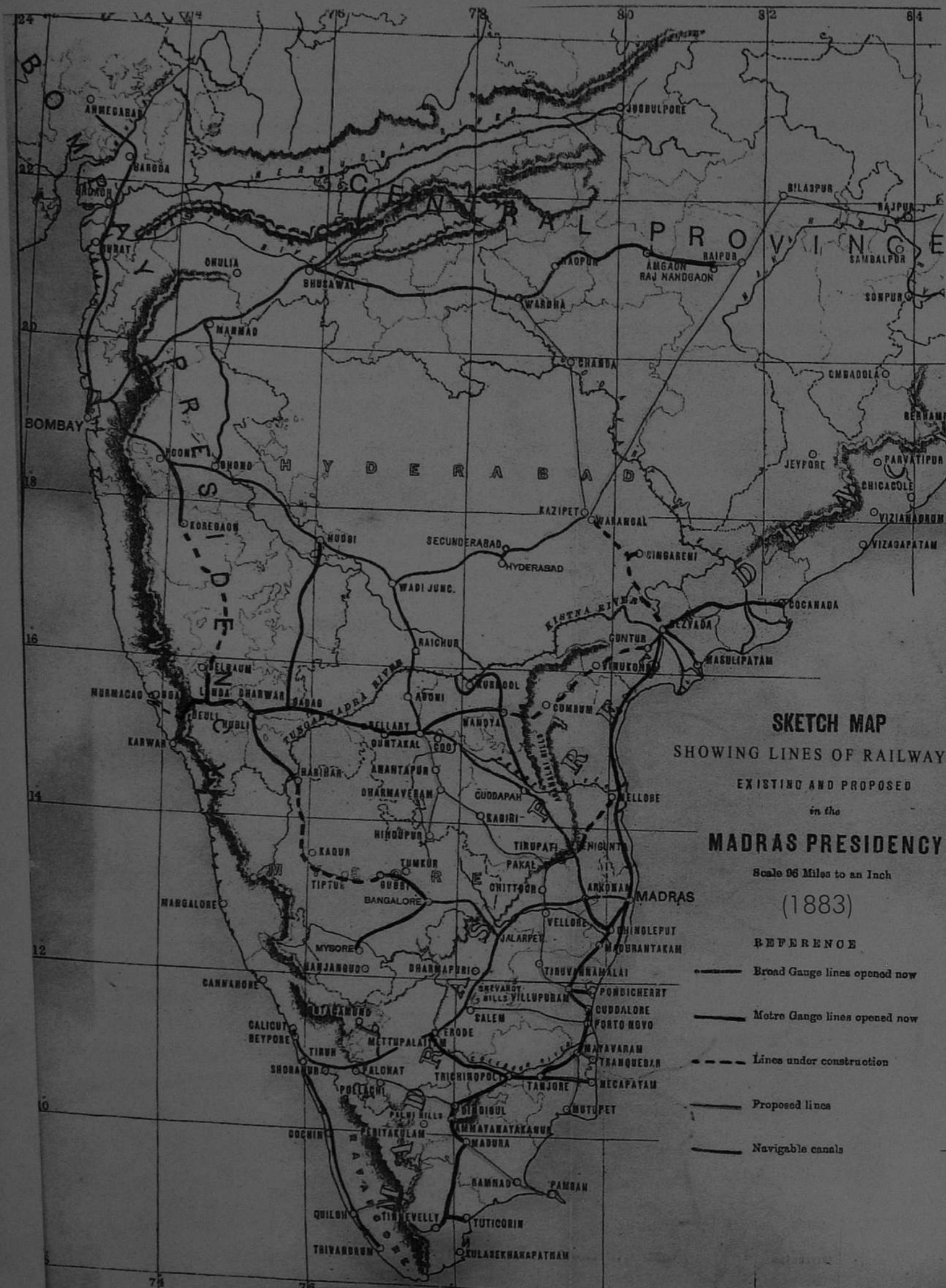
will be sufficient inducement to the contracting parties to undertake the work, and they deem it right therefore to limit their guarantee accordingly. In all other respects the terms of the agreement will be similar to those which are contained in the contract with the East Indian Railway Company, copy of which I forward for your information."

The guaranteed return was increased to 4½ % by another communication of 7th June 1852.

All things settled, MADRAS RAILWAY COMPANY was registered on 26th July 1852. A great event indeed !



Two locomotives of Madras Railway A 0-4-2 'H' class locomotive No. 245, built by M/s Kitson & Co., Leeds in 1877, being pulled by a shunting locomotive No. 1 of 'PW/E' 0-4-0 ST class, built by M/s Hudswell Clarke & Co., Leeds in 1905.



4. Madras Railway Company-South West Line

Madras Presidency in the middle of 19th Century was the southern most part of the Indian Empire. It included (i) five subordinate Native States viz., Travancore, Cochin, Pudukkottai, Banganapalle and Sandur, (ii) the State of Mysore and (iii) the Province of Coorg. The Madras Presidency thus covered whole of the southern portion of the Indian Peninsula, the west coast being washed by the Indian Ocean and the east coast by the Bay of Bengal, while the northern boundary was formed by the accidents of history and consisted, from east to west, of Orissa, the Central Provinces, the State of Hyderabad and the southern most districts of Presidency of Bombay. The area of Presidency was larger than that of United Kingdom. The Madras Presidency was ruled from the Fort St. George, the capital of the Presidency, named by its founders in 1640 after England's patron saint.

Along the whole length of the Western Coast at a distance from the sea varying from 50 to 100 miles runs range of the Western Ghats, a steep and rugged mass averaging 4,000 and rising to 8000 feet, the only break in which is the Palghat gap in Malabar 16 miles wide. Down the Eastern Coast, the greater distance from the sea sweeps the chain of the Eastern Ghats, the less marked formation usually 2,000 feet in height. On their way southwards these two ranges eventually meet and at the point of the upheaval known as the Nilgiri hills. North of this plateau elevated table land from 1000 to 3000 feet above the sea upheld by the hills lying east and west of it and consisting of the Coorg, the State of Mysore and the parts of the Madras Presidency immediately on the fringe of the latter.

The Presidency thus consisted of a narrow strip of land between the Western Ghats and the Indian Ocean, the broader strip between Eastern Ghats and the Bay of Bengal and an elevated tract lying midway between the two.

The strip along the Bay of Bengal is not however, homogeneous throughout as the other two tracts may be. There were 5 natural divisions in the Madras Presidency namely (1) the West Coast, (2) the Central table-land, (3) the Agencies, (4) the East Coast and (5) the South Division.

3 The East Coast, the typical geographical formation of Madras Presidency had influenced the proposals for rail lines in their formative areas. A proposal for rail lines naturally has to emerge out from the capital of the Presidency, the city of Madras or Chennai as we now call it. The earliest proposals for experimental lines were projected towards Arcot.) A description of Arcot may be in order at this stage. North Arcot District on the eastern side of Madras Presidency was a part of the former Muslim Subha of Arcot lying north of Kallar river. Arcot was the corruption of the Tamil Arukaddu (six forests), the country was once occupied by six forests in which dwelled equal number of tribes. The South Arcot was the southern part of the Arcot. The north district North Arcot was separated from Cuddappah by a portion of the Eastern Ghats, more popularly known as Tirupati hills. A long valley north towards Cuddappah district breaks the range. The pioneers of rail lines took advantage of this gap by constructing the northwest line of Madras Railway facing up these ghats on its way to Bombay.

The South Arcot district was bound on the east by the Bay of Bengal and on the South by Thanjavur (Tanjore) and Tiruchchirappalli. Arcot about 60 miles from Madras was the most important town near Madras. It was the headquarters of the North Arcot District and its population was around 10,000 in the middle of 19th Century. It was the capital of powerful Nawabs of the Carnatic and was occupied by English in 1751. In 1758, Arcot was surrendered to French and in turn was surrendered to Hyder Ali, who held it up to 1782.



The first sod of Madras Railway Company was turned on the 9th June 1853 at Royapuram for an experimental line from Madras to Meril, a distance of 50 miles towards west. The commencement of the works is always a fitting occasion for public display of special satisfaction and rejoicing on the part of all high Officials of the Government as well as the railway and their friends and family members. What could have happened on the fateful day of 9th June is described below:

The ceremony of 'cutting the first sod' was celebrated with the distinguished personage of Madras Presidency, Mr. Edward Smalley, Agent, Madras Railway Company, other guests and Railway Officials. They all assembled at Royapuram at the appointed time. A resplendent wheelbarrow and spade of polished wood and shining silver was formally presented by the Agent and Chief Engineer of Madras Railway Company to the distinguished personage, who was earnestly invited in a flattering speech to convert himself - ceremonially into a navy for a short space. Graciously ascending the distinguished personage diverted himself of his outer garment and plunged the elegant and costly spade into the virgin turf; the wheelbarrow was duly filled and rolled off along the appointed plank-way, and was gravely overturned amidst the cheers of the assembly. The distinguished personage retained the valuable implements as a worthy trophy of the occasion, and the party adjourned to more substantial features of the celebration, including liberal consumption of 'good cheer' without which no Anglo-Saxon can regard any undertaking as properly inaugurated.

The terminus at Madras was on the sea-beach, at a spot called Royapuram, and conveniently situated for the mercantile part of the town, which is built parallel to the beach; while any trade which the bad and inhospitable

roadstead would allow would be carried on from the terminus with all the facilities that were obtainable.

Building.

The Porch of the station building in the new millennium is not in a good shape. One pillar had been removed at some point of time. However, one side of the porch is in a good shape with its flowery motifs in original condition.

The Royapuram Station Building at the turn of the millennium now wears a deserted look. It continues as a part of the Station building without much significance. However, for a historian there are a couple of things worth to note viz.,

i) On one of the stairs leading to the main hall of the station, there is a benchmark with following inscriptions: -

G	T	S
	⊙	
B	M	

This is a clear indication of Great Trigonometric Survey of India's Bench Mark.

ii) Flowery motifs on some of the pillars of the porch are in good shape and depict the art of that era.

iii) The main hall of the station is about 30 feet x 40 feet. A Burma Teak wooden beam supports the roof structure. The wooden beam is 30 feet. long, 18 inch. wide and $2 \times 12 = 24$ inches high. This is in good condition. This wooden beam supports 11 cross beams on each side for holding the roof.

iv) Lamp holder in the staircase bears the following inscription

Platform Lamp
MR Knightmerry & Davies, Makers
Birmingham



The Royapuram station, Iron pillared and looking for all the world like a Regency Mansion, was declared open by Governor Lord Harris on June 28, 1856. In his speech, congratulating the Madras Railway Company, its manager Major Jenkins and all who had worked on the railway, Lord Harris said that the cost of £5,500 a mile was well worth the investment and looked forward to equally expeditious completion of the additional 450 miles of track to the west coast, a little south of Calicut. The service was inaugurated with two trains, coaches made by Simpson & Co., the leading coachbuilders of the day. One train carried the Governor and 300 Europeans to "Am (b)oor", where a magnificent "dinner" had been laid out for them. Another train, with the Indian invitees, followed and traversed a shorter distance, to "Trivelloor", but whether they got dinner is not known.

Captain Barnett Fort, whose drawing appeared in The Illustrated London News, described the rooms in the Royapuram station as being "very elegant and most superbly furnished with handsome punkahs & c." In its derelict state today little of this is recognizable. In fact, with modifications over the years, just a few of the original pillars are left and the station is only a faint echo of its original handsomeness. An adjacent building, built around the same time as the headquarters office of the Madras Railway Company, was pulled down a few years ago.

The inaugural runs were as colourful as they were sensational, for the thousands who had gathered along the way had never seen a train in their lives.) 12

The Illustrated London News described the journey from Madras to Beypore (Calicut) in these words:

"As the train proceeded across the arid plain of the Carnatic, it brought to view the countless number.... who thronged the route.... The train dashed by the masses of colours, here clustered by a bridge, there collected under the deep shade of a tope, crowded round a station house, or fringing the edges of a cutting, cheering loudly as the train flew by them. Now and then too, a hearty laugh broke forth when in passing some pasture ground, the lazy cattle, startled by the rushing shriek of the train, flew frantically away, sometimes followed by the scared herdsman himself, who, thinking that the fiery-fiend whom he saw approaching might crush him also, took to his heels with all his speed.

(The Madras Station is a prominent object from the shipping, and is near to the new pier which has lately been erected through the surf. The railway, on leaving Madras, is carried in a westerly direction as far as Gudiyattam, passing on its way Arakkonam (42 miles from Madras), the junction for the Bombay line, and near the military cantonments of Arcot and Vellore: though the railway is not taken close to these latter towns, but is kept at a distance of three or four miles from them with the purpose of securing the easiest possible gradients and works. Passing the town of Gudiyattam, the railway runs south to Jolarpettai, near Vaniyambadi, the junction of the branch to Bangalore; and then to the city of Salem, where, again bending westerly, it is carried on to Erode, the junction with the Great Southern Railway, running to Tiruchchirappalli and Nagapattinam; and so on to Coimbatore, and then following the course of the river Ponni, passes through a gap of the Western Ghats, called Palghat, to Beypore, which is 406 miles distant from Madras."

At the commencement of the construction of railroads in Bengal, a system of contracts was



tried, and after a short time abandoned as productive of much trouble and little result. In Bombay, large contractors had done all the work entrusted to them, and as far as the contracts were concerned, there had been few failures; but in Madras the plan of doing work by contract was not tried. Mr. Bruce, the first Chief Engineer of the line, had had in Bengal experience of the annoyance caused by feeble and incompetent contractors, and at once determined to execute the Madras line by the direct agency of the engineers of the company.

The entire distance of 406 miles from Madras to Beypore (Calicut) was divided into seventeen districts for the purpose of construction. The first portion of the line sanctioned was from Madras to Meril, a distance of 50 miles, authorized as an experiment, and as a line that would set the ground rules for other sixteen districts. More details of construction as described in Edward Davidson's book 'The Railways of India' published in 1868: *over*

Madras To Gudiyattam: 96 Miles ✓

The line is absolutely deficient in works of engineering interest in every respect including the bridges, and even these were of the simplest kind. The gradients are unexceptional, and the works extremely light.

Shortly after leaving Madras, the railway passes the river Cortillaur by a handsome and substantial stone bridge of twenty-six arches of 30 feet each; and near Arcot the river Ponni is crossed by a similar viaduct of fifty-six openings. The arches are segmental, and of the same size as those over the Cortillaur, the superstructure being of granite, roughly dressed, the piers resting on high walls protected by massive stone inverts. After passing the city and port of Vellore, but at some distance from it, the railway meets the river

Gudiyattam, and over two of its separate channels the railway is carried by viaducts similar to those over the Cortillaur and Ponni, the first containing twenty-four openings and the second five.

This length was opened in sections—the first, from Madras to Arcot, a distance of 64 miles, on the 1st of July 1856; the second, of 17 miles, on the 7th of May of the following year; and the third, of 15 miles more, on the 11th of May 1858.

Gudiyattam To Salem: 110 miles

After passing Gudiyattam, the ground becomes rather more difficult, but easy gradients are still maintained. The line, however, instead of running parallel to the general drainage of the country, now crosses it; and the number of bridges is therefore much increased.

There are in these distance ninety-five bridges and numerous culverts, but the largest are those over the Palar and Ponni rivers. A viaduct of fourteen openings of 30 feet arches, and five of 64 feet, spanned by iron girders, carries the railroad over the former; and another of eighteen openings, all of 30 feet arches, over the latter. Besides these viaducts, the tributaries to these rivers required bridges of some size; but the uniform dimension of 30 feet was retained in every instance but two, i.e. over the Juniteporan, which was crossed by five arches of 15 feet each, and the Godar, which had a bridge of twelve openings of 20 feet each.

The remaining viaducts between the Palar and Ponni rivers consisted of five openings over the Gotar, three over another crossing of the Godar, seven over the Pimperpooth, or Palamode river, and seven over the Moorunaputty, or Muttoer, all of 30 feet arches. Beyond the Ponni, and between that river and



Salem, there were two more viaducts, one, of seven openings, over the Athoor, and the other, of four openings, over the Shevoroy, the same span of 30 feet being retained. The foundations were usually on brick wells, and the superstructure was sometimes of the same material. Much difficulty was experienced in getting flat bedded stones for masonry; and boulders, which are to be found everywhere, were therefore used largely both in foundation and superstructure. Where the piers were made of brick, the cutwaters and angles were protected with quoins of stone.

The works, on this line are peculiarly simple and inexpensive; and the masonry structures, though suitable and substantial, are of a very ordinary character, and do not call for any particular description.

From near Vaniyambadi, a branch, 84 miles in length, has been constructed by an easy incline up the ghats discovered by Major Pears, to Bangalore, so as to bring that important military port into railway communication with Madras, but there are no works on it of any engineering interest.

Salem to Beypore (Calicut): 209 Miles

Beyond Salem the country is flat and level for some distance, and the railway meets with no obstacle until it reaches the Cauvery, at Erode, the bridge over which is the most important work on the South Western line.

Here wrought-iron girders have been adopted in lieu of the ordinary 30 feet arch, and there are twenty-two openings of 64 feet each. The piers are of stone, which was obtained in the district, of an admirable quality and with flat beds, which produced masonry of a substantial character. There is comparatively little water in

the Cauvery during the dry season of the year, and advantage was taken of this circumstance in getting in the foundations of the piers. Dams were run out from either bank, enclosing on the left a space for nine piers and on the right for eight piers, the middle space, viz. that for four piers, being left open for the flow of the current of the river.

Between Erode and Coimbatore, the line is carried over a level country, with no works of greater importance than twenty small bridges. Beyond Coimbatore the character of the country changes, becoming more hilly and broken by ravines. The jungles near Walliar proved peculiarly unhealthy and deadly both to Europeans and Natives. The Western Ghats were crossed at the remarkable gap in the range called Palghat; and then the line, following the duration of the Ponni as far as the town of Tirtalla, bends at that point to the north, and runs in a straight course to Beypore (Calicut). Between Coimbatore and the ghats the rivers Walliar (Noyyel) and Kolegad (Pureley) are crossed by viaducts of five and fifteen openings of 30 feet each—the height of the former, viz. 33 feet from the bed of the river to the base of this line, remarkable. There are besides two bridges one of 30 feet arch each, and twenty-three others of small dimensions, varying from 20 to 9 feet.

Beyond Palghat the difficulties in the line were above the average, as many torrents, taking their rise in the Syhadree range, rush across the low strip of the Malabar coast to the sea. As laterite abounds in this district, the smaller bridges were usually built of it, the quoins being of gneiss. Over the river Wattlepolliam, a masonry bridge of three openings of 30 feet each is erected; but over the Thotha, which was about 960 feet in width, a temporary wooden structure, at a skew of 45°, was at first formed. But the wooden bridge has been taken down, and



wrought iron girders, twelve 60 feet openings, have been substituted for it.

The Kadalundi was a much more troublesome river to deal with, as it was 2370 feet in width, with a bottom of mud to a great depth. A wooden viaduct, consisting of sixteen openings of 24 feet and sixty-eight spans of 12 feet, was put up, as a temporary measure, in the first instance; but to be replaced by an ordinary iron girder bridge. The foundation was to have been obtained by screw piles; but as the depth of mud proved very great, cast iron cylinders, 6 feet in diameter, at 70 feet intervals from centre to centre, leaving clear openings of 64 feet each, have been sunk, in the usual way. The girders are 139 ft. 10 in. long, in five lengths: two of 21 ft. 4 in., two of 30 ft., and one of 37 ft. 2 in., in the middle. They are supported in the centre, and are so constructed, it will be observed, as to pass over two clear spaces of 64 feet each, which is an unusual arrangement. The width of the bridge altogether is 26 feet, the distance between the two cylinders forming each pier, from centre to centre, being 24 feet. A smaller stream, called the Terror, 330 feet in breadth, was the only other stream of any size passed by the railway; and over it a bridge of a similar character is to be erected.

The Madras Railway is fortunate in not having to encounter any serious engineering obstacles requiring costly works or expedients to overcome them; but having this advantage financially, the structures on the line necessarily possess little interest in an engineering point of view.

"Bey pore chosen as a terminus in the lack of any good harbour upon the coast has proved unsatisfactory, and having no natural advantages as a port, the railway has not yielded that amount of through traffic which a line stretching from

coast to coast across the peninsula might have been expected to obtain. Inquiries have therefore been set on foot with a view of finding a more suitable port and terminal station. Calicut, a few miles farther to the north, has been thought of, but it would be little, if any, better than Bey pore and Cochin, which has a small natural harbour and a rather convenient roadstead, has also been examined. It has the drawback of being situated in a foreign territory; but this objection may perhaps be overcome by treaty arrangements with the Rajah. The question, however, remains for the present undecided, but it is dubious whether a change will be advantageous or will yield more revenue. In the absence of any central and flourishing place of trade of decided prominence, the district of Malabar, its towns and population, is in truth the terminus of the line".

3 (Construction began from Bey pore too. Bey pore - Tirur (19 miles) was opened on 12.03.1861; Tirur - Kuttipuram (9 miles) on 01.01.1861; Kuttipuram - Pattambi (12 miles) on 23.09.1861 and Pattambi - Podanur on 14.04.1862; and with this a direct railway connection was established between the east coast and west coast.)

To quote William Logan, the Collector of Malabar from his book 'Malabar':

("But it has been felt ever since that it was a mistake for the railway to stop at Bey pore, which is only an insignificant fishing village, and that the line should have been brought into Calicut, the head-quarters of the district, only seven miles distant from the terminus. On 9th February 1880, after much previous discussion, a public meeting was held at Calicut, and resolutions were passed and a memorial drawn up, praying that the line might be brought into Calicut.) The prayer of the memorialists was favourably received and

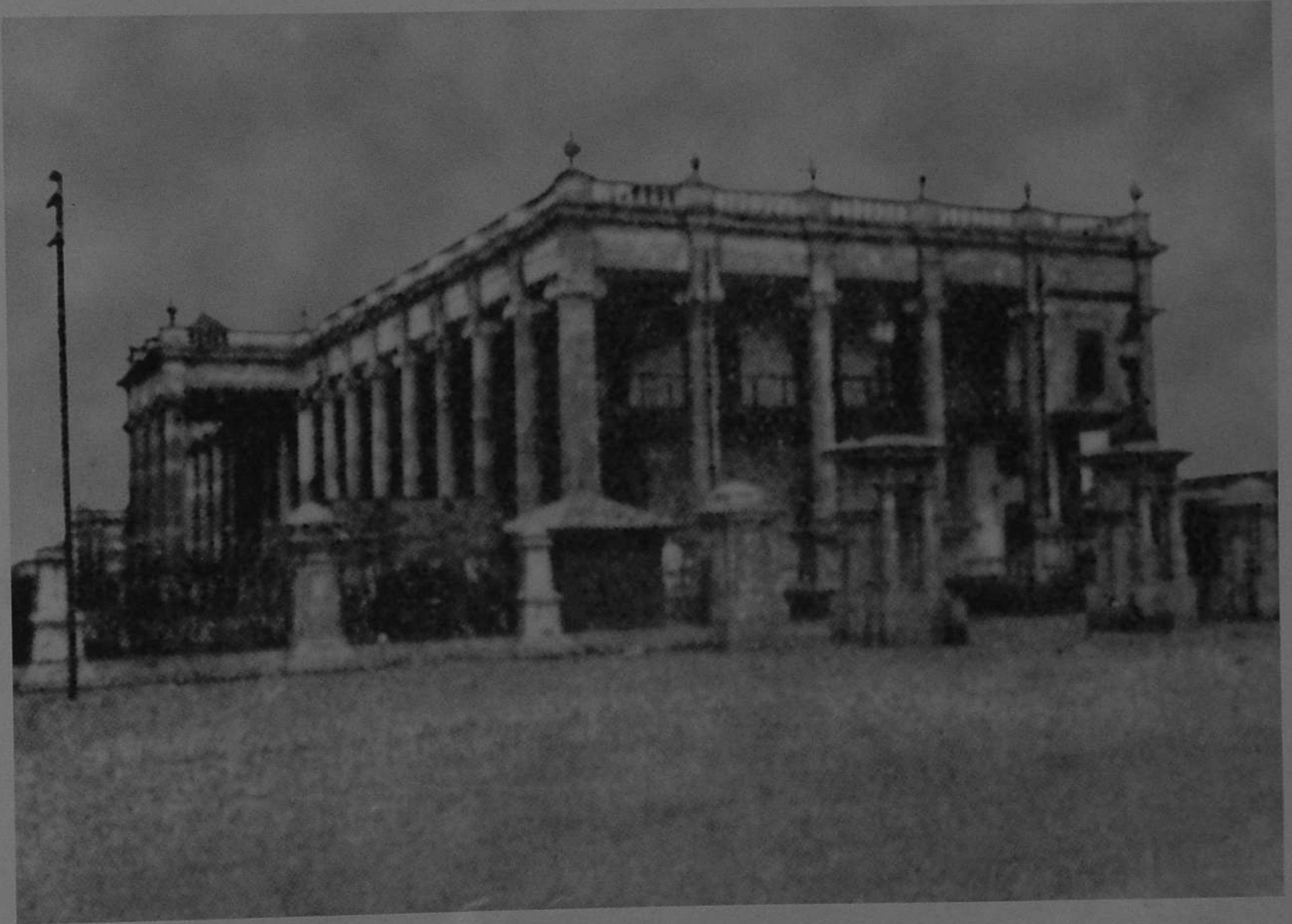


the preliminary survey of the line has recently been completed".

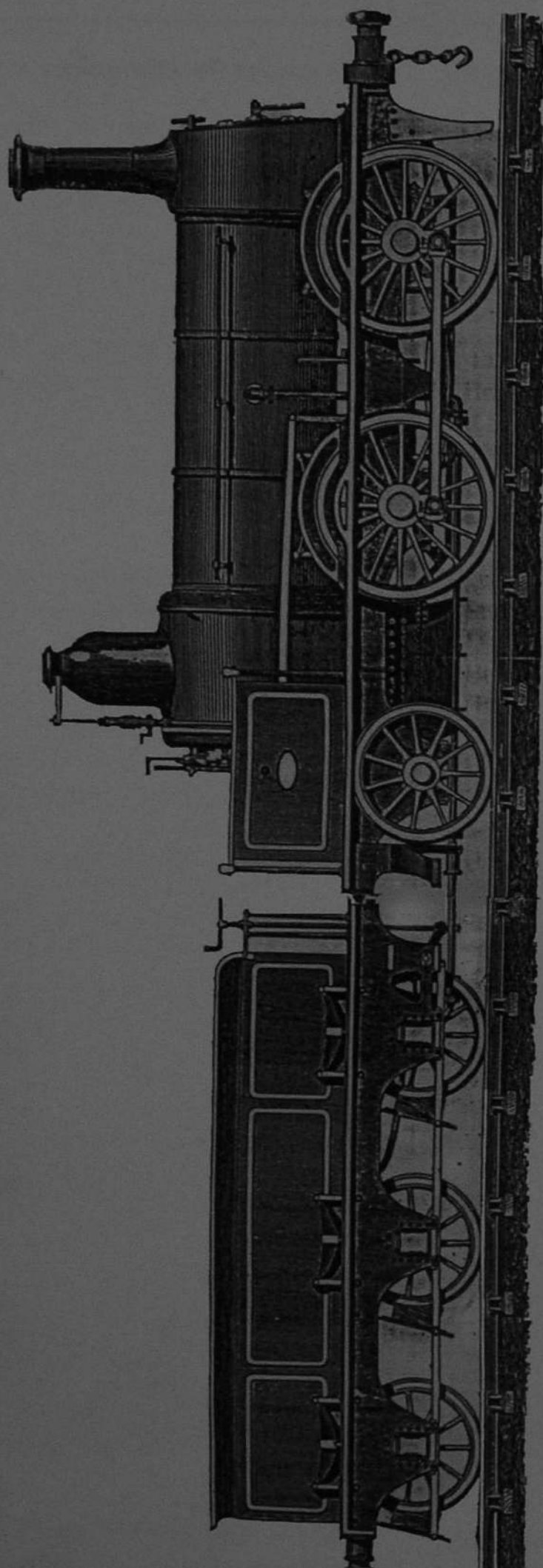
4 (Extension to Calicut was opened on 02.01.1888.)

Extension To Mangalore :

(With the turn of the century, Madras Railway Company decided to make extension of Calicut line northwards to connect Mangalore, the major port on the west coast. Calicut to Mangalore (221 km) line was opened in stretches beginning from 01.10.1901 to 03.07.1907. With this the Madras Railway Company's last major project was completed. 3/4)



General Office of Madras Railway Company at Royapuram, Chennai, built around 1860



A Passenger locomotive (0-4-2), built by M/s Beyer Peacock & Co., in 1867 for Madras Railway Company.

5. Madras Railway Company - North West Line

(In 1849, the residents in Madras held a public meeting, the right Hon'ble Governor being in the Chair for the purpose of preparing a scheme for a Joint Stock Company to construct a railway line from Madras to the interior towards Arcot.

Captain Colliyer of the Madras Engineers offered to make a survey and estimate. Maj. Pierce, Major Smith & Captain Bell all of the same regiment were requested to consult with Captain Colliyer to determine a direction of the particular line and generally to complete all the information that could be obtained on the subject. This was followed by the appointment of Major Pierce for making a report on Railways in Madras Presidency, not only for the experimental line but to the ulterior destination of Railways to facilitate communication for political and commercial purposes. Maj. Pierce submitted a series of reports in 1850. From much careful investigations he came to the conclusion that one trunk line should run from Madras to Malabar coast via Vaniyambadi, Salem, Palghat and the other to diverge from the first line at a point about 70 miles due west of Madras and then climb the eastern ghats near Palmanair and carried via Bangalore to Bellary and from then to Pune and Bombay. Madras Government approved both lines selected by Maj. Pierce and recommended that the direct line from Madras to Bombay via Palmanair and Bangalore and Bellary should have the precedence in point of execution. It so happened that the trade from Bellary to Madras was estimated at Rs. 2½ lakhs annually and from Cuddappah to Madras was Rs. 25½ lakhs. Further the distance from Madras to Bellary via Cuddappah is 316 miles but by Bangalore it would be 100 miles more. Further Cuddappah is 400 ft. above the sea while Bangalore 3000 ft. above the sea thus a railway line from Madras to Bellary via Bangalore would be 100 miles

longer than by a direct route and would mount at least 500 ft. only to fall again and also miss the entire existing trade from Cuddappah.

Mr. John Peter Grant, the then Home Secretary strongly condemned the proposed construction by Palmanair until the complete survey of the Cuddappah district had been made. These surveys ultimately led to an alignment from Madras to Arakkonam and to Guntakal and Raichur to connect the GIP line. A branch line 31½ miles long to Bellary from Guntakal was also proposed to tap the traffic there.

This line commonly known as the North Western Line, was again surveyed by Mr. Thomas Harding Going who joined Madras Railway as an Assistant Engineer in 1857 and served up to 1875.

Lt. Col. R.J. Going, grandson of Mr. T.H. Going edited the diaries of Mr. T.H. Going few years back giving a vivid picture of the life of the times. Extracts from the diaries of Mr. T.H. Going are reproduced to give a glimpse of that era and the survey and construction of North West Line.)

"Mr. T.H. Going arrived the Coast of Madras on 18.05.1857 after graduating from Trinity College, Dublin and worked on a railway construction work in USA for about 6 years. He was assigned the job of surveying the route for the proposed North West Line, eventually to join with GIP Railway line from Bombay.) For the survey he selected two native assistants: David and Vedantacharry. He engaged a writer to be responsible for accounts and mail, two lascars for camp protection and other duties, a cook, a syce for his horse and one personal servant named Imambeg. Tents and other baggage would be carried by bullock wagons. On 27th May Mr. T.H. Going took the train to Tripachur 36 miles to the west of Madras. By then this line was



ready. On 1st June, this party set off for the first camp to the North West. Mr. Going's commission was to survey the first part of North West Line as far as Gooty about 175 miles, which would join the line starting from Bombay. The junction of the railway system was to be near Raichur. There were 12 principal rivers to cross, including Naggery, Cheyair, Paupugnee, Pennar and Tungabhadra. In about 6 months time, the survey was completed up to Gooty, the line was plotted to run to the east of Tirupati and along the north east Palakunda range to Cuddappah".

On the completion of the survey to Gooty, Mr. Going was given the assignment to construct the line between Arakkonam to Pudi in 1859. The construction began on this hilly sector with a number of rivers and passes. The Madras Railway adopted the construction on the departmental system instead of going through the agency of contractors.

A few of the construction activities as described in Mr. Going's diaries are reproduced below:

" a) STONE WORK

The mode of quarrying granite in the Madras Presidency is peculiar, and a description of it may be interesting to those unacquainted with the process.

There is, in India, a caste of people known as wudders, whom I may, in general terms, describe as the navvies of India. They are of two classes - those who work in stone, and those skilled in the manipulation of earth.

The stone wudder is a hardy, sinewy fellow, whose stock in trade consists of a house, which, when on his travels, he transports on the back of his donkey, or else on the head of his

wife (no remarkable instance of tyranny, since it consists of nothing but a mat and a few bamboo stays); then he has a heavy crowbar, a few iron wedges, some earthen pots, dog, and a small stock of rice. He is, in fact, being a good deal resembling the Irish tinker of times not so ancient but that we can recall the picture. Arrived at his quarry, his first care is to lay in a stock of firewood, which he cuts in the jungle, and removes by means of a peculiar bandy or cart with low wheels of solid timber, drawn by a pair of buffaloes, an important part of his equipment, which I omitted to include before in the list.

The wood is piled in small quantities on the surface of the rock, and ignited, usually during the night, their favourite time for work. After the fire has been steadily kept up for some hours, the upper layer of the rock expands sufficiently to produce a separation from the substratum. The separation is accompanied by a dull bursting sound; and the extent of the severance is ascertained by a series of taps with the crowbar, the response of which is conclusive to a practiced ear. The next operation is to break up this loosened bed of rock into fragments of a size convenient for handling, and this is affected by means of a round boulder of green stone, as large as can be lifted to his head with the assistance of another man. This he dashes down with all his might on the rock, and sometimes succeeds in making a fracture with a single throw; but it often requires to be repeated many times; and it is wonderful, considering the clumsiness of the method, with what success he turns out handsome square blocks of stone, of dimensions well suited for building. This, however, is more to be attributed to the natural tendency of the stone to square fracture than to the skill of the wudder.



b) WELL SINKING

Various means of sinking foundations are resorted to by Indian Engineers; a favourite one is that by wells. Thus, over the site of the pier or abutment is built a series of circular brick wells, about 3 feet interior in diameter. They are placed side by side, and in sufficient number to cover the area of the foundation. Being built to the height of 3 or 4 feet, a driver gets into the well and commences excavating the sand beneath his feet, and hands it out in a basket. As he excavates, the well sinks; and when it reaches nearly to the surface of the water additional courses of brick are built up; and so on, successively, as the well sinks, the driver being obliged to fill his basket under water when the process of sinking has brought him beyond his depth. Finally, a second diver stands on his shoulders to assist his descent. The wells being sufficiently sunk, the intervals and spaces contained between contiguous wells are filled with broken bricks, mixed with stiff clay, to within a few feet of the surface, and rammed hard. The tops of the wells are then removed to the level of this rammed surface; and, as soon as the water has been reduced by means of baling-baskets, the first courses of the foundation are laid with brick cubes, previously got ready by cementing together in this form with a number of ordinary sized bricks.

c) EARTH WORK

The earthwork of Railways in India is performed by a different process from that of usual in England, where the quantities in cuttings and embankments are commonly so proportioned that the material taken out of the former may be sufficient to construct the latter. In India, however, the value of human labour is low, - man's wages on the Madras Railways being equal to 3d. per day, and a woman's to 1½d. - the value of land is also small; and for these two reasons the

system adopted is, to spoil the cuttings and make the embankments from side ditches. The use of wheelbarrows too is ignored, their representative being a flat withy basket, holding about two cubic feet. These are filled by means of an implement called a mommoty, which may be described as a large hoe, with a short handle, and, being lifted on to the heads of the women, and by them carried to the bank. It is surprising how fast this process raises a pile of earth. The worse of it is, that a bank made in so loose a manner is liable to settle for a long time. It has been often attempted to introduce the wheelbarrow mode of work, but with little success. The basket of antiquity - probably antediluvian - still holds its own. I have heard of an instance of an enthusiast in wheel barrows who, having exhausted his morning energy in the fond endeavour to restrain a gang of coolies from the use of the objectionable basket, had the mortification, on making his evening tour of inspection, to find them carrying the wheel barrows on their heads, in the belief that it was only a convenient modification of the principle.

(Arakkonam to Puttur (26.86 miles) section was opened in 1861. The line was extended to Renigunta (14.46 miles) on 15.09.1862 ".)

Mr. T. H. Going was later commissioned for surveying the remaining 100 miles line upto Raichur. The survey to Raichur took its toll. A number of associates and their family members of Mr. T.H. Going died during the process of survey, due to sickness and other calamities. By the end of 1862, the survey was completed upto Raichur, while the survey was continuing towards Gooty by another party. (Renigunta to Reddipalli (38.02 miles) was opened for traffic on 01.10.1864. Extension of Cuddappah (39.59 miles) was opened for traffic on 01.09.1865. Cuddappah to Muddanuru



(34.31 miles) was opened for traffic on 01.08.1866. Extension to Tadpatri (32.07 miles) was opened for traffic on 01.09.1868 and the extension to Gooty (29.72 miles) was opened for traffic on 01.08.1869.)

In 1865 Mr. T. H. Going was elevated and became the Assistant Chief of Construction covering the whole of Madras Railway Company.) A poem written by Mr. T.H. Going in 1864 is reproduced below :

" Turned out at six and washed and dressed,
Read Darwin until Ten
How hazel to apricots progressed
And apes improved to men.
Then breakfast, reading, writing, thinking,
And thinking, reading, writing, dinner.
Some men when lonely take to drinking.
Thank God I'm not a thirsty sinner".

(Gooty to Tungabhadra (75.33 miles) was opened on 02.12.1870 and its extension to Raichur (17.92 miles) was opened for traffic on 15.03.1871.

This was the completion of the North West Line.) After completing, his assignment on Madras Railway Company, Mr. T. H. Going went with his well earned leave to England in 1873 married and returned back with his wife, but could not live long and breathed his last on 15th September 1875. With the completion of survey and construction of North West line, the person who did the entire job also became a martyr. What a fate!



*Madras - General view of the Central Station in 1910
Note the tramway and its overhead lines along with horse drawn carriages*

6. Evolution of Metre Gauge

THE FIRST AGREEMENTS of 1849 with EIR and GIP Companies stipulated a gauge of 4 feet 8½ inch and rails of weight 84 lbs. to the yard, as combining the greatest utility and economy. Lord Dalhousie, Governor General of India (1848-56) and Mr. Simms, Consulting Engineer to the Government of India disagreed with the recommendations of the Court of Directors of East India Company for the gauge of 4 feet 8½ inch. Mr. Simms favoured 5 feet 6 inch while Lord Dalhousie recommended 6 feet. Lord Dalhousie minuted:

"The British Legislature fell unconsciously and perhaps unavoidably into the mischievous error of permitting the introduction of two gauges into United Kingdom. The numerous and grievous evils which arose from that permission are well known and will long be felt throughout all England. The Government of India has in its powers, and no doubt will carefully provide that, however, widely the railway system may be extended in this Empire in the time to come, these great evils shall be averted, and that uniformity of gauge shall rigidly be enforced from the first. But I conceive that the Government should do more than this, and that now, at the very outset of railway works, it should not only determine that any uniform gauge shall be established in India but that such uniform gauge shall be one which science and experience may unite in selecting as the best".

The Court of Directors finally agreed to a gauge of 5 feet 6 inch as the most suitable and this was adopted as the standard gauge in India.

Lord Dalhousie left India in 1856, soon thereafter began the correspondence regarding adoption and advantages of narrower gauges in India. In 1861, during the Viceroyalty of Lord Canning, the Public Works Department prepared a long note recommending a narrower gauge. In December 1862, the Indian Branch Railway Company proposed to construct light railways.

Lord Elgin (1862-64) succeeded Lord Canning as Governor General; his Government will here no narrow gauge railway except in such detached and fragmented sections as held out no promise of being over-worked. Sir John Lawrence (1864-69) succeeded Lord Elgin and in the early years of his Viceroyalty, he followed Elgin's policy about narrow gauge railways.

Early in 1869, railway enterprise in India was at low ebb; the lines built had cost exorbitant sums; their working expenses were high, their profits were meagre and they were a great burden on the revenues of India. It was, therefore, realized that if railway extension was not to be stopped, line of the cheapest description consistent with safety and durability should be constructed. It was in this background that Lord Lawrence recorded a minute dated 9th January 1869 advocating employment of the agency of the State for the construction of Railways and the adoption of a narrower gauge.

Lord Mayo (1869-72) carried on voluminous correspondence with Secretary of State favouring Narrower Gauge on grounds of economy and the rapidity of railway expansion. Lord Mayo can be said to be the author of Metre Gauge Railways in India. An extract from his Dispatch No.24 dated 11th March 1869 to the Secretary of State is reproduced below:

"Among the most conspicuous of the facts that a review of the past history of railway construction in India brings out is the paramount importance of a very strict limitation of the capital outlay. An extravagantly constructed railway is permanently a financial failure. To a poor country like India this lesson is of exceptional importance".

Lord Mayo's views were further amplified in his Dispatch No.51 of 17th May 1879:



"Firmly convinced of the sufficiency of a narrow gauge to carry the traffic of our secondary lines, and fully satisfied that an important economy must ensure in the aggregate over the whole extension system, we should fail in our duty to India, if we hesitated to advocate the adoption of gauge narrower than the present standard. Whether the gauge should be 3 feet or 3 feet 6 inch is comparatively a matter of detail. As at present we should regard 3 feet 6 inch as the maximum width that should be adopted. An early decision on the point is called for, so as to admit of timely arrangements being made for rolling stock and we should be glad if your grace would determine it after communication with the best authorities on the subject".

In 1870, a Committee consisting of Colonel R. Strachey, R.E., Colonel C. H. Dickens, R.E., Mr. John Fowler, C.E. and Mr. A.M. Rendel, Consulting Engineer to EIR was appointed to consider the precise gauge and general character for an average narrow gauge line of railway in India. Three of the members recommended 2 feet 9 inch while one member recommended 3 feet 6 inch.

On 30th December 1870, Lord Mayo recorded a lengthy but masterly minute giving his reasons for not adhering to the previous policy of the Government of India regarding adoption of 5 feet 6 inch gauge. Extracts from these minutes are reproduced below:

"In considering unprofessionally such a subject and in endeavouring to arrive at a sound conclusion as between the two narrow gauges recommended, viz., 3 feet 6 inch and 2 feet 9 inch, we can only be guided by experience and authority. In this view there is no doubt that we should be quite safe in adopting the 3 feet 6 inch gauge; for it has been well and effectively tried, and is admitted to be sufficient for conveyance of a large amount of traffic.

I have the greatest respect for the ability and judgement of the experienced engineers who have recommended the 2 feet 9 inch gauge, but the responsibility of selection now devolves upon my shoulders, and I am not prepared to recommend the adoption in India of any system which has not stood the test of experience, and is not supported by the almost unanimous opinion of skilled engineers.

I think, therefore, that the adoption of 3 feet 3 inch one will provide for all the possible requirements of the country. I should prefer it.

The 3 feet 3 inch gauge would give, according to these proportions, a horse box 6 foot 6 inch in the clear, and 5 feet 6 inch in the interior. This would give a space for two horses abreast of 2 feet 9 inch each (including the partition) which is precisely the space allowed on the horse boxes of the EIR".

Thus in 1870, after careful analysis of the situation, Lord Mayo considered that 3 feet 3 inch gauge was the best gauge for the secondary network of railways in India.

At that time the Government of India was considering adoption of Metric weights and measures. This gauge being very close to the metre, rounding off to 3 feet $3\frac{3}{8}$ inch or one metre was made and coined as 'Metre Gauge'. Thus in January 1871, Metre Gauge was established in India.

An urgent communication was sent to the engineers of Rajputana State Railway to change the gauge and choose 'Metre Gauge' for their rail-lines.

Rajputana State Railway was the FIRST to adopt metre gauge system. South Indian Railway was the first Company Railway choosing metre gauge extensively for their lines. They converted substantial lines built on Broad Gauge alignment into metre gauge.

Excellence in Metre Gauge



A Metre Gauge YG locomotive, 2-8-2 design, in steam



An Electric Multiple Unit suburban train on its way to Tambaram in 1931.

Two views of Madras Egmore station of South Indian Railway as built in 1906



The platform looking east; Note the beautiful ironworks, the pillars were made by M/s John Lysaght Ltd., Bristol



Third Class Waiting Hall

7. South Indian Railway and its Predecessors (1859-1907)

The lines formerly owned and worked by the Great Southern of India and the Carnatic Railway Companies were amalgamated on the 1st July 1874, under the title of the South Indian Railway. Let us begin with the roots:

GREAT SOUTHERN OF INDIA RAILWAY COMPANY

Great Southern of India Railway Company was registered in 1859 to construct a BG line from Nagapattinam to Tiruchchirappalli for the improvement of the means of inter-communication between the rich and populous districts watered by the river Cauvery and the port of Nagapattinam. The line was later extended to Erode. Construction of these two sections on BG alignment is detailed below:

Nagapattinam To Tiruchchirappalli: 78½ Miles.

The first sod of the railway was turned on the 5th May 1859.

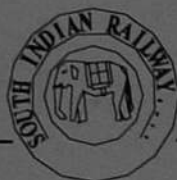
For 40 miles the line runs through rice-fields and for the remaining 38 miles over inundated cultivation or wasteland. The rails were so raised as to be above the floods and inundation on a bank, of an average height of 6 feet. There are eighty-nine bridges of various sizes, twelve of which had openings of 30 feet, spanned either by girders or arched; and the rest were all of smaller dimensions. The largest viaduct was one of fifteen arches of 30 feet each, over the river Moothalay; the foundations of which rest on clay 14 feet below the surface, instead of on brick wells as usual. The only other bridge of any importance is a girder bridge of ten 30 feet spans, over a stream called the Rajah's Nullah, which has a rapid current during the wet season. There are 250 culverts, and 2¾ million cubic yards of earthwork in bank and cutting. Most of the bridges are of brickwork; but in some, laterite has been used.

There were no works of difficulty on the line, as it ran for the most part over a level and very productive district, in which provision had to be made for the passage of many tributaries to the Cauvery, and of numerous irrigation channels. The works being so light, it was determined to make the railway without the aid of contractors; and the entire line was constructed without difficulty or delay.

The construction was done at rapid phase and the first section from Nagapattinam to Tiruvarur (23.06 km) was opened for traffic on 15.07.1861. Extension to Thanjavur (54.31 km) was opened on 02.12.1861. Four months later the line was extended to Tiruchchirappalli junction (56.9 km) on 11.03.1862. On the same day a small line from Tiruchchirappalli to Tiruchchirappalli Fort (4.35 km) was opened for traffic. All these construction was on BG alignment.

Tiruchchirappalli To Erode: 88½ Miles.

The railway, after passing near the town and cantonments of Tiruchchirappalli, and avoiding the undulating land in the interior, as well as the valuable rice fields adjacent, keeps parallel and very near to the river Cauvery. About 4 miles from Tiruchchirappalli it crosses a considerable stream called the Codamooty, just at its confluence with the Cauvery, and then, without any bridges of consequence, it is carried to the town of Karur, on the river Ambamootay, which is 1000 feet in breadth, with foundations in deep fine sand. Beyond this river the line still skirts the Cauvery; but has rather severer gradients to encounter, as a ridge 181 feet higher than the level of the town of Karur runs down to the Cauvery, at right angles to the direct course which the railway must take.



Surmounting this obstacle the railway falls with a gradual slope to the river Noyyal, which is a considerable stream of rather less width than the Ambamootay.

Beyond the Noyyal to Erode junction, the ground still rises, and the line, for the purpose of avoiding valuable rice-land, is taken over stony undulating ground, with rock near the surface for nearly the whole distance. The gradients used are rather severe, though 1 in 100 is the worst; but to obtain even this, very considerable amount of earthwork in bank and cutting has been found to be requisite. Throughout the entire length of this short railway there are no bridges of any magnitude or of special importance, and this rail-road has been constructed and finished at a cost less than any other line in India, the single track not having exceeded 7700£ per mile.

Tiruchchirappalli Fort to Karur (71.78 km) was opened for traffic on 03.12.1866. The line was extended to Kodumudi (27.60km) on 01.07.1867. Connection from Kodumudi to Erode (37.69 km) was effected on 01.01.1868. At this point the lines of Great Southern of India Railway Company were connected with the Madras Railway Company's Jolarpettai - Beypore (Calicut) Section. The Great Southern of India Railway Company continued operating all these lines on BG alignment till it was amalgamated into South Indian Railway.

On formation of South Indian Railway, the BG line from Nagapattinam to Erode was planned for conversion to MG. Nagapattinam to Thanjavur line was converted to MG on 19th June 1875. Thanjavur to Cuddalore section (17.43 km) was converted to MG on 10th July 1875 and Cuddalore to Tiruchchirappalli junction (32.41 km) was converted to MG on 17th July 1875. The section from Tiruchchirappalli Junction to Karur was converted

to Metre Gauge on 1st July 1879 and Karur to Erode on 16th December 1879. Incidentally the section from Tiruchchirappalli to Erode was reconverted to Broad Gauge on 26th September 1929.

There are two grandfather clocks with GSIR markings - one decorating the house of General Manager, Southern Railway and another of Divisional Railway Manager, Tiruchchirappalli. These are important heritage items of the bygone era, clicking the years by minute arms.

CARNATIC RAILWAY COMPANY

Carnatic Railway had its origin in the Indian Tramway Company, established in 1864 for construction of light railways. Indian Tramway Company put forward proposals for narrow gauge light railways in Southern India and constructed a railway on 3ft. 6 inch gauge between Arakkonam and Kanchipuram (28.41 km). This line was opened for traffic on 08.05.1865. In January 1868, this line was transferred to Carnatic Railway. Carnatic Railway Company was asked to extend the line to Cuddalore.

There is a large cloth tracing neatly framed and kept in Divisional Railway Manager Office at Tiruchchirappalli showing the details of the various lines proposed by Carnatic Railway. This cloth tracing gives the following information-

i) Title - Carnatic Railway Map showing proposed line Kanchipuram-Cuddalore dated 22.10.1870

ii) Scale 1" = 2 miles.

iii) Lines in operation - Madras Railway BG line from Madras (Royapuram), Arakkonam and beyond. Madras Railway 3ft. 6 inch gauge from Arakkonam to Kanchipuram.



iv) Carnatic Railway's proposed line from Kanchipuram to Chengalpattu; Chengalpattu to Villupuram, Villupuram to Cuddalore and a proposed line to Pondicherry via Villupuram.

In 1874, the lines run and projected by Carnatic Railway were taken over by South India Railway Company. South India Railway Company decided to convert the 3ft. 6 inch gauge line to MG. The Kanchipuram - Arakkonam line was converted to MG in July 1878. Simultaneously construction began to connect Kanchipuram to Chengalpattu. Chengalpattu to Wallajabad (21.98 km) was opened on 01.08.1880 and Wallajabad to Kanchipuram (12.78 km) was opened on 01.01.1881.

PONDICHERRY RAILWAY COMPANY LIMITED

Pondicherry Railway Company Limited was established in 1874. Their plan No.1 dated 30th November 1874 in original was handed over to the Government Officials in Paris on 03.08.1875. Pondicherry Railway built 12.63 km. long railway line from the east bank of Gingee River and opened it for traffic on 15.12.1879. The construction was done under the supervision of South Indian Railway Company. By a contract dated 8th May 1878 between Pondicherry Railway Company and French Colonial Government, the management of this railway was given to South Indian Railway Company. The Pondicherry Railway Company preferred voluntary liquidation and after few legal hassles it was amalgamated into South Indian Railway Company.

A cloth tracing of Pondicherry Railway Company is the only tell tale sign of this Railway. This tracing now decorates the meeting room of Tiruchchirappalli Divisional Office.

SOUTH INDIAN RAILWAY

The lines formerly owned and worked by the Great Southern of India and the Carnatic Railway Companies were amalgamated on the 1st July 1874, under the title of the South Indian Railway. By 1880, Pondicherry Railway was also merged into it. The management of South Indian Railway in the year 1880 consisted the following senior officers:

1. Agent : Mr. W. S. Betts
2. Chief Engineer : Mr. D. Logan
3. Chief Track Superintendent : Mr. A. Stanton
4. Chief Loco Superintendent : Mr. E.G. Shewart
5. Acting Chief Loco Superintendent :
Mr. J. M. Budge
6. Chief Auditor : Mr. J. Smith

The South Indian Railway can be commended for employing a large number of native drivers. In the year 1882, the traffic affected by Madras Railway and South Indian Railway was almost equal but South Indian Railway employed almost six times more native drivers than the Madras Railway.

By the end of 1880, the South Indian Railway Company had constructed the line from Madras to Tuticorin, a distance of 444 miles with branches- Tiruchchirappalli to Erode, Chengalpattu to Arakkonam, Maniyachi to Tirunelveli and Villupuram to the Gingee River.

Villupuram Katpadi section (98.93 mile) was opened for traffic in two spells in 1890-91.

Mayiladuturai-Mutupet section (53.61 mile) was opened on 2.4.1894. The line was extended to Pattukottai (17.03 mile) on 20.10.1902 and to Arantangi (28.35 mile) on 31.12.1903.



29-mile long Madurai to Manamadurai line was opened on 1-8-1902. On the same day, the line was also opened to Mandapam (60.39 mile from Manamadurai). 7.04 mile long Pamban to Rameswaram section was opened on 1.9.1906, leaving a bridge on the viaduct.

On 1st January 1891, the State purchased the assets of the South Indian Railway Company and handed it over to a new company in the same title for working as an undertaking along with Villupuram Guntakal State Railway. In 1893, the portion from Dharmavaram to Guntakal was made over to Southern Mahratta Railway

On 31st December 1907, the South Indian Railway System consisted of

- i) MG mainlines from Madras Beach junction to Tuticorin via Villupuram, Mayiladuturai, Thanjavur, Tiruchchirappalli, Madurai and Tuticorin.
- ii) Arakkonam Branch (MG) from Chengalpattu to Arakkonam via Kanchipuram
- iii) Katpadi Branch (MG) from Villupuram to Katpadi and an extension to Pondicherry.
- iv) Mayiladuturai to Tiruvarur (MG) to Aranthangi via Tiruvarur.
- v) Nagore Branch (MG) from Nagore to Tiruchchirappalli via Nagapattinam and Tiruvarur.
- vi) Manamadurai-Mandapam Branch (MG) from Madurai to Mandapam. Pamban-Rameswaram (7.04 miles) was also open for traffic.
- vii) Maniyachi to Tirunelveli (MG)
- viii) Katpadi-Dharmavaram (MG) branch
- ix) Pakala-Gudur Branch

Reorganization took place from 1st January 1908 and is covered in chapter No. 12.

South Indian Railway constructed and successfully managed few other lines described below: -

a) Karaikkal - Peralam Railway (MG) :

This line was partly in French territory and was constructed by the Agency of SIR Company with the object of placing the town and port of Karaikkal in communication with the railway system of South India. Construction of this line, 14.65 mile long, was sanctioned in 1895 and was opened in 1898.

After opening of the line, the operation and management of the line was entrusted to SIR.

b) Thanjavur District Board Railway (MG):

This railway was constructed by the agency of SIR Company and the money for the railway was raised by the imposition, with the concurrence of the inhabitants or their representatives on the District Board, of a special cess of 3 pies in the rupee (about 1.5%) on all lands which would be served by the railway or benefited by its construction. It was entirely a new concept, and opened the way for the provision of railways for which Government was unable to find the money immediately, either by the District Board itself raising the capital when the cess is sufficient for this purpose, or by giving a guarantee to a company.

Construction from Mayiladuturai to Arantangi (99.46 mile) section was sanctioned in 1890 and the line was opened through in 1903.



The funds were in the first instance provided in equal proportion by the Government of Madras and by the Thanjavur District Board from its railway guaranteed fund created by a special local cess. On 1st January 1900, the Thanjavur District Board took over the Government's portion being treated as a loan at 4% per annum. Extensions of the line were also carried through the agency of SIR. SIR worked this line.

c) Tirunelveli - Quilon (Travancore) (British Section) (MG):





Construction of 50.48-mile long section was sanctioned in 1899 and the line was opened in 1903. The line was constructed by SIR Company, the Government guaranteed interest on the debentures to be raised by SIR for its construction. SIR worked this line.

d) Tirunelveli - Quilon (Travancore) (Native Section) (MG):

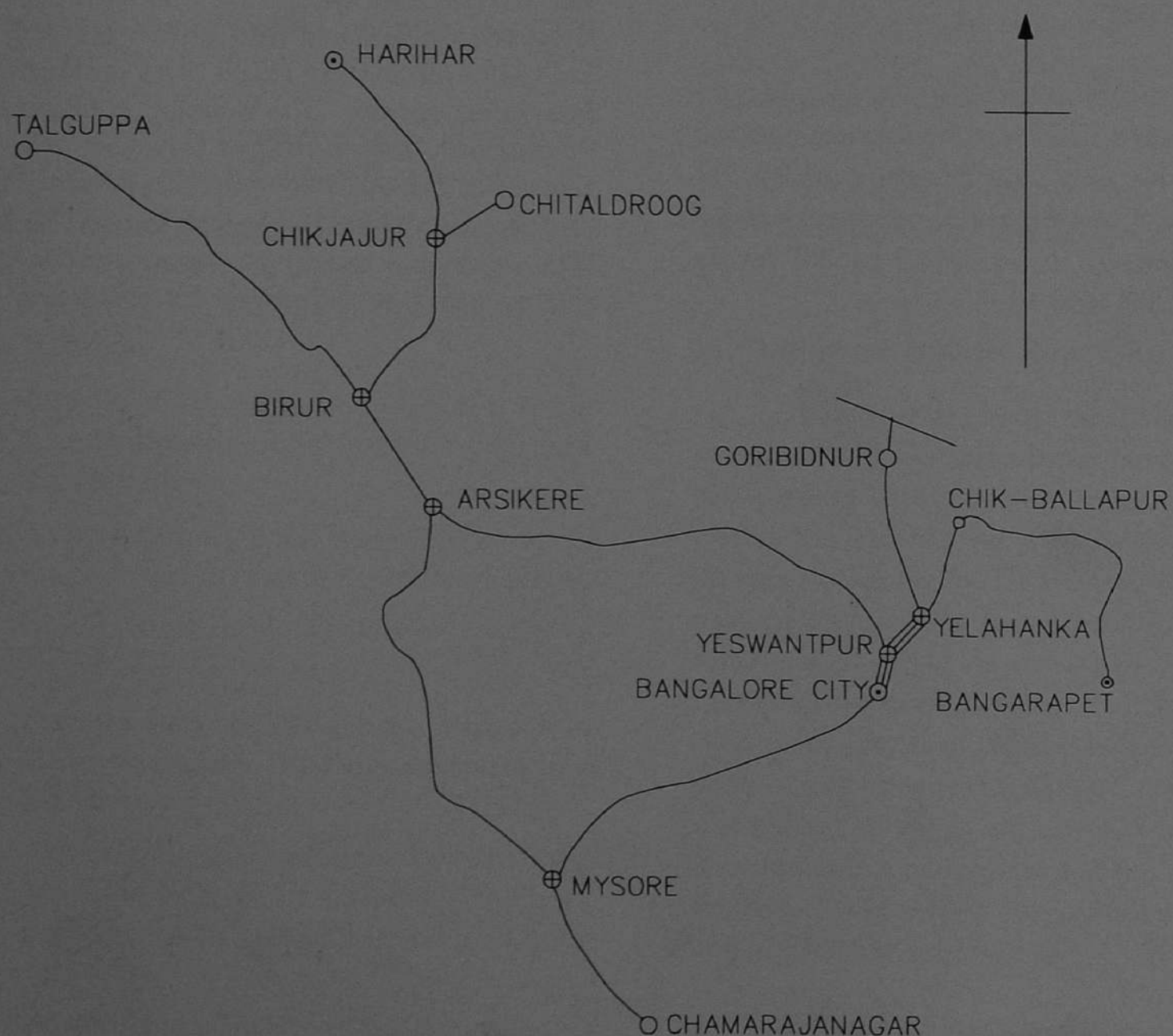
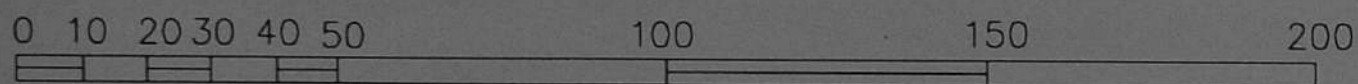
Construction of 57.98-mile long section was sanctioned in 1899 and the line was opened in 1904.

The line was built and worked by SIR on the same terms as applicable to the Tirunelveli - Quilon British Section.

Quilon or Kollam, as it is called now became the terminus for the Tirunelveli - Quilon line. The ownership of Quilon terminus and the native portion was with the Maharaja of Travancore. The old MG station building was built with typical local touch. The ventilators are fine wood carved. The building is like a large houseboat, the manager's house; now the Divisional Stores Office had a number of glass murals on ventilators. The flooring had Venetian tiles. Both the buildings, though not in good shape, needs consideration for preserving.

Mysore State Railway  
Home, Branch & Local Junctions 
Junctions Connecting Foreign Lines 

SCALE IN MILES



8. Mysore State Railway

The Mysore State projected a railway line between Bangalore and Mysore in 1870. The project was abandoned after survey was completed in 1871-72. The project was however, revived during the famine year 1877-78 when a part of the earth work was carried out by famine labour. The Roads and Buildings Branch of Public Works Department supervised this work. In 1879, it was finally determined to construct the railway line from Bangalore and the work recommenced. Around this time, the Madras Railway Company was constructing a line from Madras Royapuram to Bangalore City (at the present location of Bangalore Cantonment Station). Maharaja of Mysore established a separate railway organization to carry out the extension from Bangalore Cantonment to Mysore as an ordinary public works. This establishment was put under the control of an Engineer-in-Chief assisted by three Executive and four Assistant Engineers. This establishment came to be known as Mysore State Railway (MSR). MSR built a 2½-mile long line on BG alignment as an extension from Bangalore Cantonment to the Bangalore City. At that point of time, in order to distinguish Madras Railway Company's, Bangalore City (now known as Bangalore Cantonment) station, the new station came to be known as Seringapatnam Bangalore City. This clarifies the Station Code of Bangalore for the present day SBC Station. From Bangalore City Station (SBC), MG alignment was chosen for connection to Mysore.

Bangalore - Mysore Section was opened in three phases from 1st February 1877 to 21st February 1882. The country traversed by this alignment was passing through a hilly terrain and the gradients were severe.

The management of Mysore State Railway, proved to be quite expensive from the point of view of the State Treasury. In 1886, it

was decided to transfer the rail lines built and owned by Mysore State Railway to the Southern Mahratta Railway Company for working. The greater portion of the Staff of State Railway was transferred to the Southern Mahratta Railway Company for employment on the understanding with the terms and conditions of their services were to be the same as in Mysore State. At that point of time, the headquarters of Southern Mahratta Railway Company was at Hubli Dharwar; 117 years later the history repeated itself. The Mysore and Bangalore divisions, erstwhile a part of MSR along with Hubli division of South Central Railway formed a new zone. The new zone is known as South Western Railway again being managed from Hubli - Dharwar.

New construction under the regime of Southern Mahratta Railway was rather slow from 1886 to 1910. During these years, the following sections were opened.

- i) Mysore - Nanjangud (25.51 km) opened in 1891.
- ii) Birur - Shimoga (60.74 km) opened in 1899.
- iii) Yeshvantpur - Hindupur (82.38 km) opened in 1892-93.

Owing to the absence of any activity from 1899 onwards, the Mysore Government during 1911-12 decided the formation of a State Railway Construction Department under the supervision of Mr. E.A.S. Bell, Engineer-in-Chief. During 1912-13, the Railway Secretariat was separated from the Public Works Department and constituted under a separate unit. The Engineer-in-Chief, Mysore State Railway Construction Department was appointed as ex-Officio Secretary for Railways. During 1919, the administration of Mysore State Railway was taken back from Southern Mahratta Railway (by then Madras and Southern Mahratta Railway).



Mr. C. D. Dove Wilson was appointed Agent and Engineer-in-Chief of the State Railway Department. To assist the Agent following was the organization:

- i) Survey : Engineer-in-Chief
- ii) Construction & Open line : Superintendent (Way & Works)
- iii) Locomotive : Loco Superintendent
- iv) Carriage & Wagon : Carriage & Wagon Superintendent
- v) Traffic : Traffic Manager
- vi) Audit & Accounts : Auditor, Railways
- vii) Stores : Chief Stores Keeper

Since the Rolling Stock of Mysore State Railway was being attended by Southern Mahratta Railway and later by Madras and Southern Mahratta Railway, no workshop was built for a long time.

It was only in 1924 that Mysore State Railway decided to have a major workshop on its own. The workshop was expanded in 1938 and is in the same complex in the year 2003.

As a result of Federal Financial Integration with effect from 01.04.1950, the Mysore State Railway came to vest in the Government of India. With effect from 14th April 1951, Mysore State Railway became a part of Southern Railway. At that point of time it consisted of 9 sections namely,

- i) Mysore-Bangalore extension
- ii) Nanjangud extension
- iii) Arsikere extension
- iv) Birur-Shimoga section
- v) Chikjajur-Chitradurg section
- vi) Bangalore-Harihar section
- vii) Hindupur section
- viii) Nanjangud-Chamrajanagar section
- ix) Shimoga-Talguppa section.

Out of these 9 sections, Bangalore - Harihar section and Hindupur section were originally built by Southern Mahratta Railway and were taken over by Mysore State Railway from the Madras & Southern Mahratta Railway with effect from 1st January 1938.

The Mysore State Railway System comprised of—

a) Mysore State Railway (MG)

These lines were the property of the Government of His Highness the Maharaja of Mysore. Of the nine sections mentioned above, the Bangalore-Mysore, Mysore-Nanjangud, Birur-Shimoga, Bangalore-Harihar and Yeshvantpur-Hindupur sections were maintained and worked by the Madras and Southern Mahratta Railway Company as part of its undertaking. The Bangalore-Mysore, Mysore-Nanjangud and Birur-Shimoga sections were taken over by the Mysore Government with effect from 1st October, 1919 and the Bangalore-Harihar and Yeshvantpur-Hindupur section from 1st January, 1938 to be maintained and worked as one concern in conjunction with other Metre Gauge sections.

The Nanjangud-Chamrajanagar section was constructed from funds provided by the Mysore District Board.

b) Kolar Gold Fields Railway (BG)

The Mysore Durbar constructed the railway in order to provide facilities for the gold fields. 15.90 km line from Bowringpet to Marikuppam was opened for traffic on 01.06.1894. For working and maintenance, this line was given to Madras Railway Company from 01.01.1901.



c) Hindupur-Yeshvantpur-Mysore Frontier Railway (MG)

This line, which was being worked by the Madras and Southern Mahratta Railway Company, was taken over by the Mysore State Railway on 1st January 1938 and worked as an integral part of its metre gauge system up to its integration with Southern Railway on 14th April 1951.

d) Mysore - Nanjangud Railway (MG)

This 15.80 mile long line was opened in 1891 and was the property of the Maharaja of Mysore. By a contract of 14th December 1899, it was handed over to MSM Railway for working. Mysore State Railway took the management back in 1919. The line was further extended to Chamrajanagar in 1926.

e) Nanjangud Town - Chamrajanagar Railway (MG)

This Railway was constructed from funds provided by the Mysore District Board. 35.87 km. long Nanjangud - Chamrajanagar section was opened for traffic on 27.08.1926.

Narrow gauge lines owned or operated by Mysore Railway have been dealt in a separate chapter 'Narrow Gauge Lines'.



No. 1 of Mysore Railway, a 0-6-0 T locomotive, built by M/s Kerr Stuart & Co. Ltd., Stoke-on-Trent in 1913, hauling a four coach train at Bangalore in 1939.



General Offices of Southern Maharashtra Railway at Hubli-Dharwar.
(at present it houses Arts College and is maintained in its pristine glory).

9. Southern Mahratta Railway

Southern Mahratta Railway (SMR) was formed by a contract of 1st June 1882 between the Secretary of State, Government of India and Southern Mahratta Railway Company. By this contract the company was authorized to construct rail lines in the southern part of the then Mahratta land. Most of the construction was to be on Metre Gauge alignment. Southern Mahratta Railway preferred to have its headquarters at Hubli - Dharwar. They took lead from Bellary. By then Madras Railway Company had built their North West line taking off from Arakkonam to Guntakal and Raichur connecting with the Great Indian Peninsular Railway (GIP). Madras Railway Company also built a 31½-mile long branch line taking off from Guntakal to Bellary. This section was opened for traffic in 1871. Madras Railway Company built all these lines on Broad Gauge alignment.

Southern Mahratta Railway's first line was a Metre Gauge line taking off from Bellary and extending up to Hospet. This 40.5 mile long line was opened for traffic on 24.03.1884. Simultaneously Southern Mahratta Railway Company purchased and converted the Broad Gauge line from Bellary to Guntakal into Metre Gauge. Conversion to Metre Gauge was completed and opened for traffic on 16.05.1887. The Metre Gauge construction was rapid and Dharwar was connected on 01.07.1885. The extension to Poona via Londa became operative during 1886 - 1887. SMR was now open for traffic and junctions had been formed with the GIP Railway at Hotgi and Poona. In August 1889, an agreement was signed by GIP and SMR in the matter of division of traffic and the rates or tariff for goods.

In 1886, Mysore State Railway's management was also handed over to Southern Mahratta Railway Company.

Southern Mahratta Railway was a very profitable Railway Company. The Portuguese Government decided to give the construction contract for a railway line leading from Marmgoa to link Southern Mahratta Railway. For this purpose a railway company in the title "West of India Portuguese Railway" (WIPR), was formed. The line to Marmgoa was opened for traffic on 17.01.1887. SMR and WIPR formed a junction at Castle Rock. WIPR was built out of British Capital on the guarantee of Portuguese Government. The understanding was that it will get the same treatment as any other railway will get in British territory. The working of WIPR was also handed over to Southern Mahratta Railway on 01.07.1902.

In 1888, SMR also took over the working of the Guntakal Bezwada line constructed by the State. Thus by 1888, SMR had established a through line from Marmgoa to Bezwada (Vijayawada). The first coast-to-coast line and that too on metre gauge alignment!

Southern Mahratta Railway also built Kolhapur State Railway and managed this Railway on behalf of the Kolhapur Durbar. This 29.27 mile long line was opened for traffic on 21.04.1891. Southern Mahratta Railway took lead from Katpadi and built Katpadi - Pakala Section (39.48 mile) and opened it for traffic on 18.03.1891. Extension to Dharmavaram (140.83 mile) was opened for traffic on 20.03.1892. By then construction from Guntakal to Dharmavaram through the agency of South Indian Railway was complete, having been opened on 01.03.1892. In 1893, this portion was handed over to SMR. Dharmavaram to Hindupur (56.55 mile) section was opened for traffic on 17.07.1893. Pakala to Gudur (84.10. mile) section was opened in 2 spells in 1887 and 1891.



Southern Mahratta Railway Company built their Central Offices at Dharwar. The existing Arts College is housed in this building. This building is maintained in its original condition and continues to display "Central Office Southern Mahratta Railway Company". The stonework and the iron works of this building are of very high quality. Even after 100 years the building is worth a visit for those interested in Railway Heritage.

In 1892, Nizam's Guaranteed Railway opened their line on Broad Gauge alignment from Wadi to Bezwada on the north bank of Krishna River, opening a through connection between Bombay on the West Coast and Bezwada on the East Coast. SMR had a through metre gauge connection from Marmgoa to Krishna (opposite side of Bezwada). In January 1893, the Guntakal – Dharmavaram section was transferred from the South Indian Railway to the Southern Mahratta Railway, and in January 1894, a connection was established between the East Coast and the Southern Mahratta Railway at Bezwada by means of a metre gauge track being carried over the Krishna River and thus Bezwada became the junction between the East Coast Railway (5'6" gauge), the Nizam line (5'6" gauge) and the Southern Mahratta Railway (metre gauge).

With competitive routes now available between the West Coast and the East Coast, the war of rates began.

In 1895, the SMR gave six months notice of the cancellation of the agreement made between GIP and SMR in August 1889. A fresh agreement was signed in

1896. In July 1898, the SMR again gave a notice to the GIP for cancellation of 1896 agreement relating to the traffic between Southern Mahratta Railway Stations and Bombay.

While this was the state of affairs in regard to competition for traffic between the Southern Mahratta Railway and Bombay, a similar war of rates was waging between the Madras Railway Company and South Indian Railway Company.

By the close of 1907 Southern Mahratta Railway Company was a major Railway Company with over 1000 mile long sections in Bombay and Madras Presidencies. The strength of the Company was recognised by the Government of India and it handed over the Madras Railway Company to Southern Mahratta Railway Company for working, the enlarged company being styled "The Madras and Southern Mahratta Railway Company".

The story of Southern Mahratta Railway Company is a story of success and success. It was the first of the three companies formed under the new guarantee scheme. The new guarantee scheme was much more favourable to the State. With minimal guarantee, the SMR Company had to work on sound economic principles. Formed in 1882, in a couple of years, SMR became a major player in railway operations with lines from West Coast to East Coast. It successfully managed the Mysore State Railway too.

The Government of India took the very first opportunity to take over this highly profitable company. On completion of 25 years of the original contract in 1907, the Company became the property of the State.

10. East Coast Railway

Survey of a rail-line on the East Coast from Vijayawada, junction point of Southern Mahratta Railway and Nizam's Guaranteed State Railway to Cuttack was ordered by the Government of Madras in September 1889. The survey was carried out in the cold weather of 1889-90. The construction of this line in the title of 'East Coast Railway' was sanctioned in July 1890. The East Coast Railway was owned, constructed and managed by the State.

The inauguration of East Coast Railway as reported in 'Times' of October 6, 1890 is reproduced below:

" East Coast Railway Inaugurated

CUMBUM, October 3: H. E. Lord Connemara, Governor of Madras, accompanied by Mr. Rees, his Private Secretary, Mr. Price, Chief Secretary and Captain Stainer, A. D. C., arrived at Guntakal junction by the mail train from Arakkonam on Monday morning, the 29th ultimo. Mr. Moss, Traffic Manager of the Madras Railway, accompanied the train. They breakfasted at Guntakal and were joined by Colonel Gracey, Deputy Consulting Engineer to the Government for Railways, Colonel Lindsay, Agent of the Southern Mahratta Railway, and Mr. E.N. Dunn, Assistant Traffic Manager. The spacious and elegant saloon of the agency, S. M. Railway, was placed at His Excellency's disposal. The whole party left at 9 a.m. by the S.M. Railway's ordinary train for Cumbum.

At Guntakal a deputation of Officials waited on His Excellency, who with genial patience, gave them a pleasant reception. All along the line village officials tastefully decorated the station buildings with festoons of leaves and flowers. Garlands of jasmine were thrown on the necks of the Governor and his suite and limes, plantains and coconuts were offered for

their use. After leaving Garalapulli the train ascended the picturesque range of hills called the Nulla Mulli forestry. The portion of the Bellary Krishna (now Southern Mahratta) Railway cost the government Rs.96 lakhs in construction and is a fine example of engineering work."

The total length of the line under construction from Vijayawada to Cuttack was 516 miles. It was divided into nine divisions. The large bridges over the Krishna canal and Godavari were formed into a separate charge. Good progress was made during 1891-92 including commencement of plate-laying at Visakhapatnam.

Southern Mahratta Railway had built Railway line from Cumbum to Bezwada (Vijayawada) in 1889-90 on MG alignment. Only after a terminus was established at Vijayawada, thoughts for connecting Vijayawada with Madras in the south and with Calcutta on northeast picked up momentum. Construction of rail lines on the East Coast line began from Waltair, an important port on the East Coast. Extensions towards southwest direction commenced simultaneously. Waltair-Vijayanagaram and Waltair - Rajamundri sections were opened for traffic on 15th July 1893. Through connections to Madras was established on 1st November 1899 with the opening of Gudur - Nellore Section, though, Gudur - Nellore section was opened 11 years back on MG alignment. Thus the turn of the 20th Century marked an important landmark in the history of East Coast Railway with a through connection between Madras and Calcutta established mainly through the agency of East Coast State Railway.

On 10.01.1899, Bengal Nagpur Railway established their connection at Cuttack and thereby paving way for linking Madras with Calcutta.

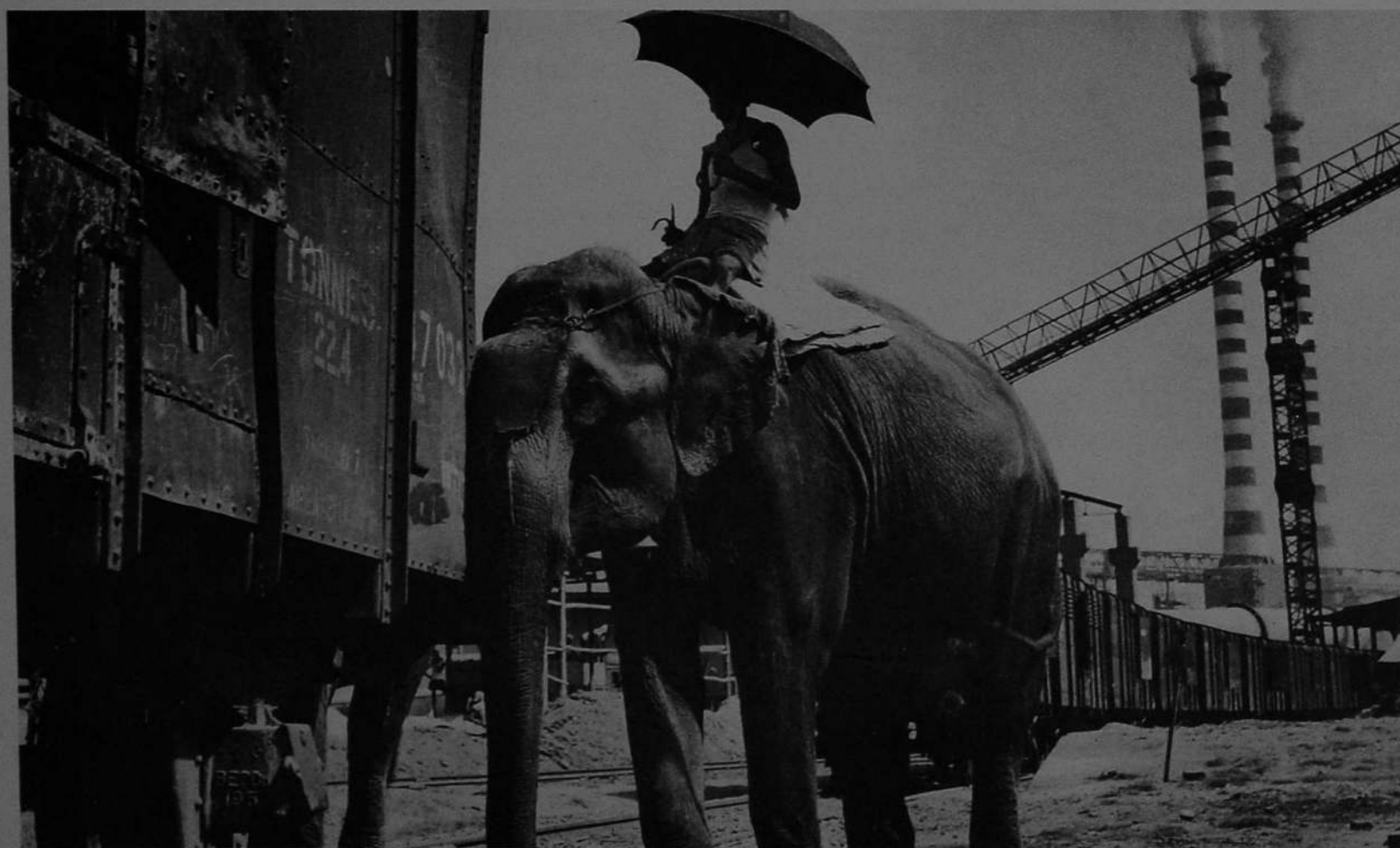


The East Coast Railway, a State entity was a major railway line to reckon with, but with huge losses. At this point of time, the Secretary of State decided to divide the East Coast Railway into two portions viz., the northern portion from Waltair to Cuttack and the southern portion from Madras (Washermenpet) to Waltair and hand them over to Bengal Nagpur Railway Company and Madras Railway Company respectively for the purpose of maintenance and operation.

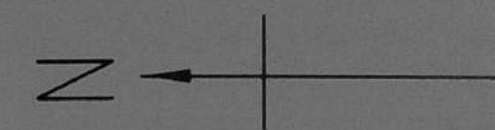
The southern portion of East Coast Railway is 497.19 miles long consisting of 485.26 miles of Main Line (Washermenpet to Waltair) and 11.93 miles of branches. The ruling gradient between Madras and Krishna Canal is 1 in 200 and between Krishna Canal and Waltair 1 in 150. Madras Railway worked the line under a contract of 31st December 1902 between the Secretary of State and the Madras Railway Company. The contract was to continue till the 31st December 1907.

Madras Railway Company managed the southern section of East Coast Railway up to 31st December 1907. At that point of time, Madras Railway Company was amalgamated with Southern Mahratta Railway to form a new entity "Madras & Southern Mahratta Railway."

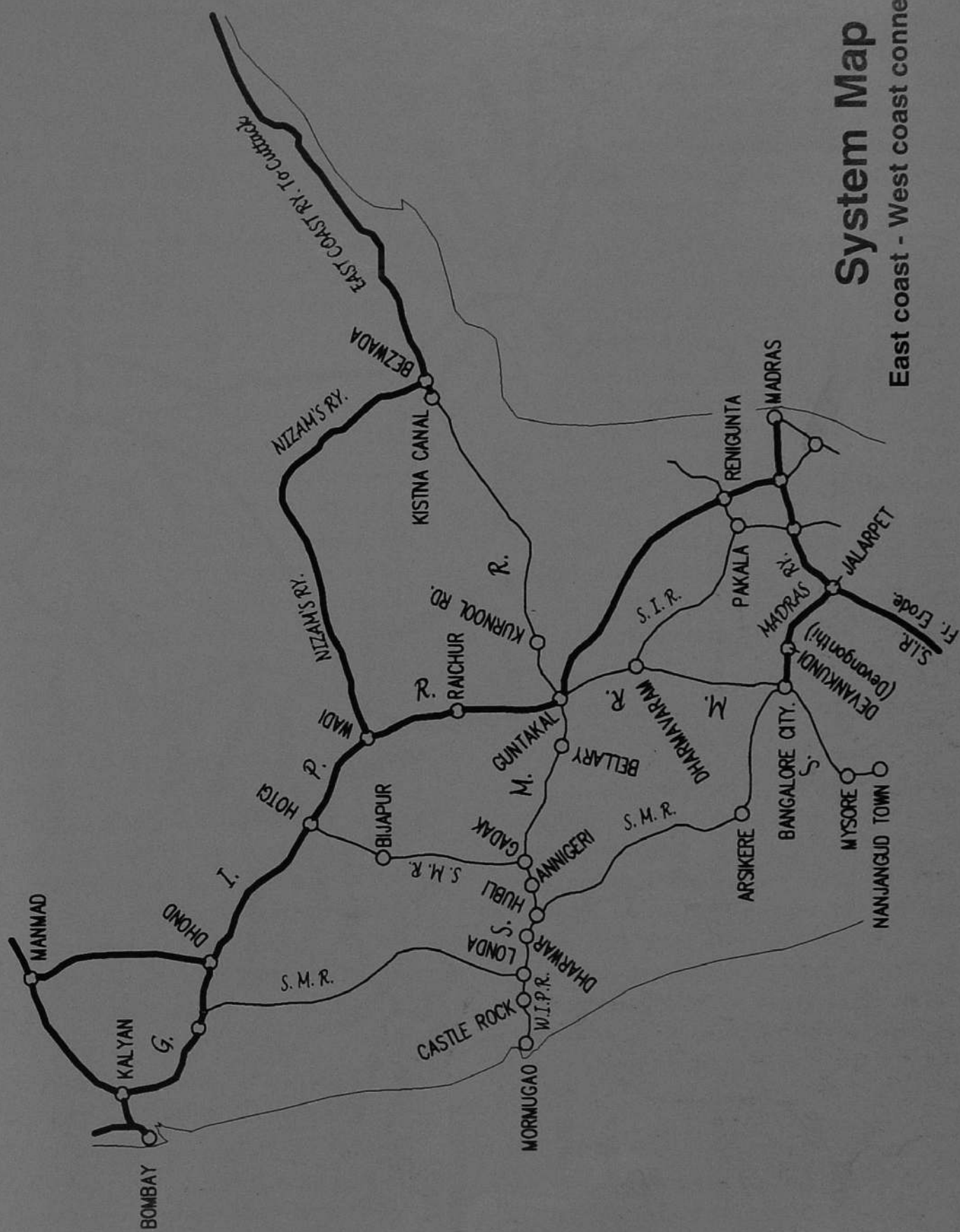
The East Coast Railway (southern section) continued to be managed from Madras initially by Madras & Southern Mahratta Railway and later by Southern Railway. East Coast Section formed an important Division of the Southern Railway titled as Bezwada. In 1966, with the formation of South Central Railway the Bezwada Division was transferred from Southern Railway. This was the beginning of the process of having smaller zones. The year 2003 saw the formation of South Western Railway, which has been dealt in a separate chapter.



An Elephant helping formation of trains at Salt Cotaures near Basin Bridge Power House



——— Broad gauge
 - - - - Metre gauge



System Map
 East coast - West coast connections

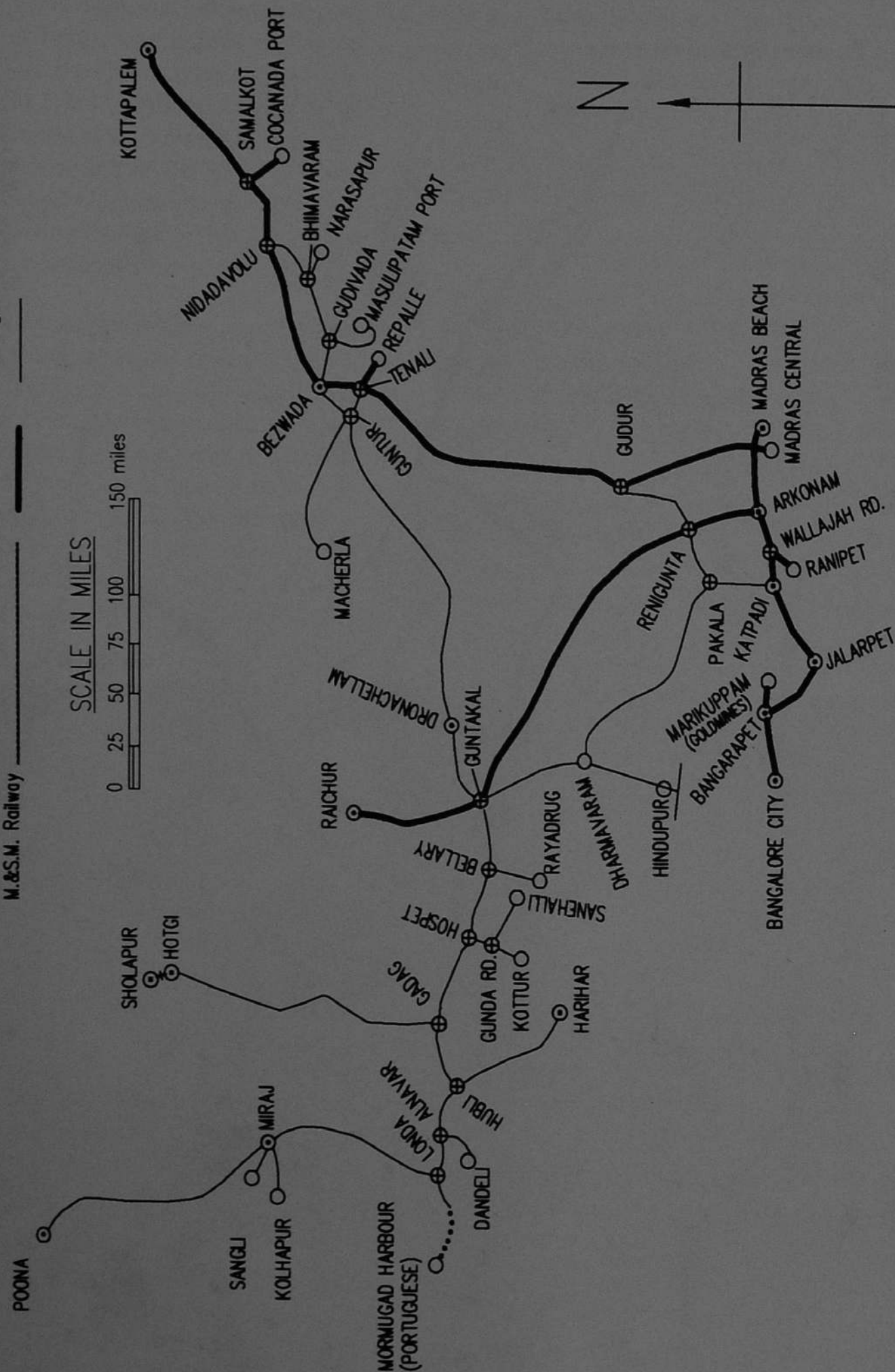
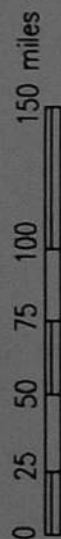
M.&S.M. RAILWAY SYSTEM (1950)

REFERENCES

5' - 6" 3' - 3 3/8"

M.&S.M. Railway

SCALE IN MILES



11. Madras and Southern Mahratta Railway

The former Madras Guaranteed Railway Company's contract having expired on the 31st December 1907 the lines owned by that Company were purchased by the Secretary of State for India, and on the 1st January 1908 the then existing Madras Railway (with the exception of the Jolarpettai-Mangalore section), together with the metre gauge sections of the South Indian Railway from Katpadi to Gudur and Pakala to Dharmavaram, was made over to the Southern Mahratta Railway Company for working, the enlarged Company being styled the Madras and Southern Mahratta Railway (MSM) Company.

Southern Mahratta Railway in 1907 was a State property managed by a company in the title of Southern Mahratta Railway Company. This State Railway virtually absorbed Madras Railway Company on 1st January 1908. Why SMR got the upper hand? The reason is clear, at that point of time Madras Railway Company was a guaranteed railway, the guaranteed rate of interest was 5%. The currency of the contract was for ninety-nine years from 1st April 1857, on that day the line reverts to Government on paying for the rolling stock at its fair price. Government may within six months after the expiry of 25 or 50 years of the term, determine the contract by purchase of the shares of the company. Government relinquished their right to determine the contract at the end of 25th year, but took advantage of the opportunity at the end of 50th year in 1907.

At that point of time, the interests of Madras Railway Company included:

- a) Madras Railway proper (5'6" gauge) comprising of Southwest and Northwest lines and other branches.
- b) Madras (Northeast line) Railway (5'6" gauge) - the southern portion of the East Coast Railway.

- c) Shoranur-Cochin Railway - This line connects Shoranur with Ernakulam, it was sanctioned in 1899 and opened in 1902. 64.65-mile long line was built on metre gauge alignment. The Raja of Cochin owned this Railway. The line was built by Madras Railway Company and after the construction was over, handed over to Madras Railway Company for maintenance and operation.
- d) Tirupattur-Krishnagiri Railway (2'6" gauge) - The railway is 25.38 miles long, was sanctioned in 1902 as a famine feeder and was opened in 1905. The line was the property of the State and was handed over to Madras Railway Company for working.
- e) Morappur-Dharmapuri Railway (2'6" gauge). The railway is 18.14 mile long. It was sanctioned in 1902 as a famine feeder line and was opened in January 1906. It was handed over to Madras Railway Company for working.
- f) Madras Railway Company was constructing Azhikal Mangalore (77.27 mile) line on BG.

In addition to the lines comprised in the system, the MSM continued to work the lines from Birur to Shimoga, Mysore to Nanjangud and Mysore to Bangalore, all of which were made over to the Mysore Durbar on the 1st October 1919. The Bangalore-Harihar and Hindupur-Yeshvantpur Railways worked by the MSM Company were transferred to the Mysore State Railway with effect from 1st January 1938.

The Bezwada-Masulipatnam Branch line (MG), which was the property of the District Board of Krishna, was purchased by the Government on the 4th February 1938, and was worked as an integral part of the MSM.



The existing contract with the Madras and Southern Mahratta Railway Co. Ltd. was terminated and MSM was brought under the management of the Government of India on and from 01.04.1944.

behalf of the Government Forest Department, was sanctioned in Railway Board's Notification No. 825-P-16, dated the 31st January 1918. Alnavar - Dandelli section, 30.77 km was opened for traffic on 01.02.1919.

Kolhapur State Railway (MG)

Kolhapur - Miraj, 47.11 km long section was opened for traffic on 21.04.1891. Kolhapur State Railway was merged with MSM on 01.08.1949 as a result of the merger of the former Indian State with the Indian Union.

Sangli State Railway (MG)

Miraj-Sangli, 7.89 km long section was opened for traffic on 01.04.1907. Sangli State Railway was merged with M & SM Railway on 01.08.1949 as a result of the merger of the former Indian State with Provinces.

Vijayawada (Bezwada)-Masulipatam Railway (MG)

This line was the property of the District Board of Krishna and was maintained and worked as an integral part of the Company's system by the M & SM Company who provided the rolling stock and other appliances, necessary thereto. The Government purchased the Branch line by determining the agreement for working the branch line from 3rd February 1938, and it was worked from 4th February 1938 as an integral part of the Madras and Southern Mahratta Railway, metre gauge system. The dates of opening are tabulated below:

Section of Railway	Date of opening	Kilometres
Bezwada to Masulipatnam	4.2.1908	79.61
Masulipatnam to Masulipatnam Port	1.1.1909	3.75
Total		82.36

Lines comprised in the system — The Madras and Southern Mahratta Railway were made up of —

	Kilometre
a) Madras and Southern Mahratta Railway including Kolar Gold field Railway (BG)	1,769.64
b) Tenali-Repalle Railway (BG)	34.46
c) Madras and Southern Mahratta Railway including Kolhapur State and Sangli State Railways (MG).	2,810.49
d) Alnavar-Dandelli Provincial Railway (MG)	30.77
e) West of India Portuguese Railway (MG)	82.14
TOTAL	4,727.41

Rail-lines built prior to 31.12.1907 have been dealt in previous chapters of Southern Mahratta Railway, Madras Railway, East Coast Railway and South Indian Railway.

Tenali Repalle Railway (BG)

The construction of the line by the ex-Madras and Southern Mahratta Railway Company, at the cost of the District Board of Guntur was sanctioned in Railway Board's Notification No.110, dated 9th April 1913. Tenali-Repalle section, 34.46 km was opened for traffic on 08.03.1916. On the 1st April 1916, the Government of India purchased this line.

Alnavar-Dandelli Provincial Railway (MG)

The construction of this line by the Madras and Southern Mahratta Railway Company, on



NEW HEADQUARTERS OFFICES

The Headquarters Offices of the Madras and Southern Mahratta Railway were originally situated at Royapuram, the old terminus of the Madras Railway. This building proved to be inadequate to accommodate the staff of all the departments, and as a result separate accommodation had to be found for the Traffic, Electrical and Medical Departments at some considerable distance from the head offices. In the year 1911 a plan was prepared for the construction of new Headquarters Offices close to Central Station, and the work of this building commenced in 1913. The Railway Gazette of 1923, describes the office thus:

' The building consists of three floors and covers an area of 82,000 sq. ft. It is faced with Porebunder stone, and the floors and roofs are

of reinforced concrete supported on steel columns and beams. The total quantity of steel work used in the construction of the building amounted to 1,300 tons. The offices are fitted throughout with electric lights and fans, the current for which is produced at the company's power house at Perambur, and are also provided with an electric lift. The building was completed in December 1922, when Her Excellency Lady Willington officially opened it. All the main departments, with the exception of the Stores, Medical and Locomotive Department, were now concentrated in the new Offices, which have been designed to accommodate 45 officers and 1,500 subordinate staff'.

Extension to the headquarters office took place after the formation of Southern Railway in 1951.

THIS FOUNDATION STONE WAS LAID

BY

HIS EXCELLENCY THE RIGHT HONOURABLE

THE LORD PENTLAND

G.C.I.E.

GOVERNOR OF MADRAS

ON THE 8TH DAY OF FEBRUARY 1915

THESE OFFICES WERE OPENED

BY

HER EXCELLENCY THE LADY WILLINGTON


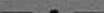

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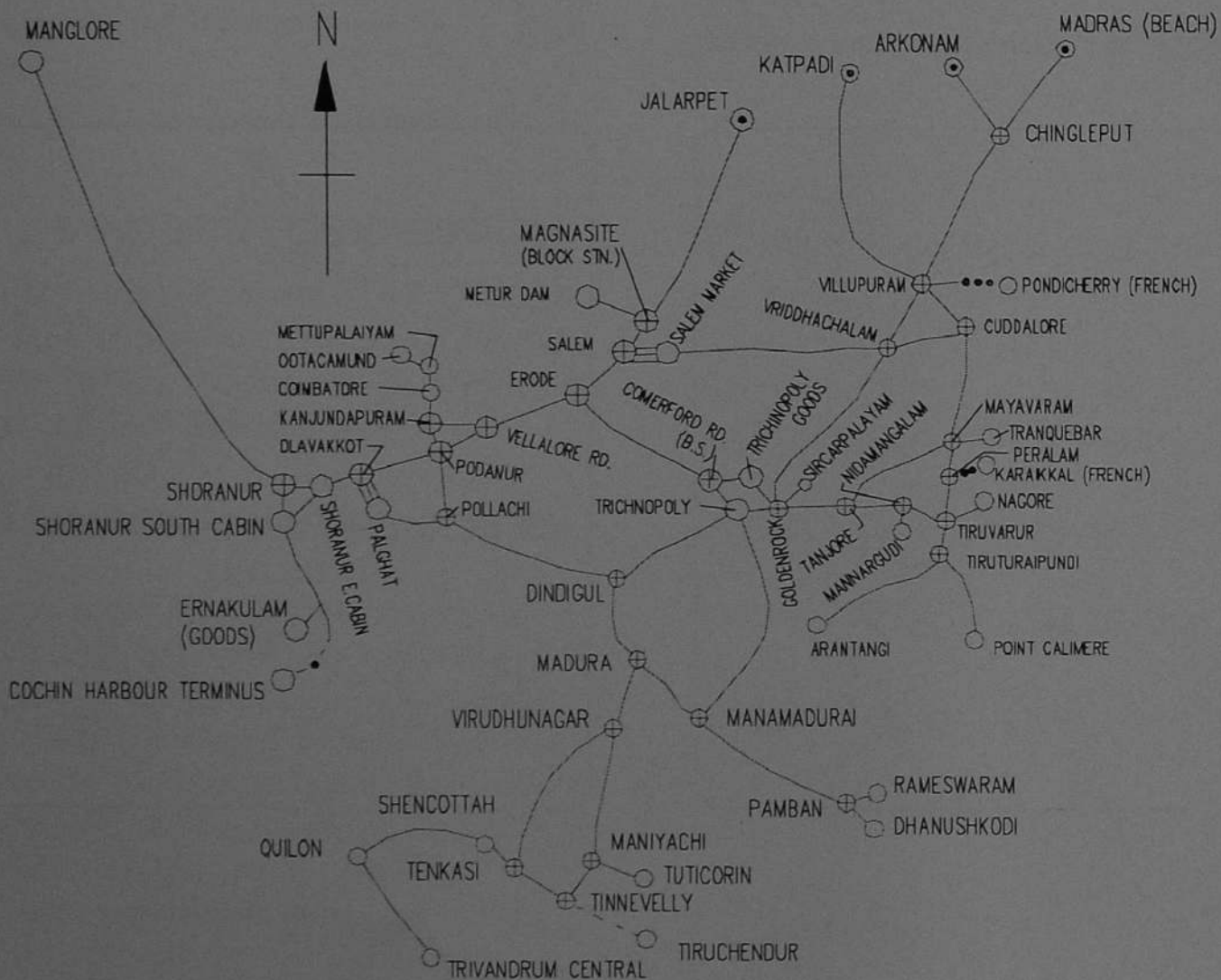
ON THE 11TH DAY OF DECEMBER 1922

S. I. RAILWAY SYSTEM (1950)

REFERENCES

MIXED GAUGE 5'-6" 3'-3 3/8"

S.I. Railway ————  ————
Cochin Harbour Line ————  ————
District Board's Lines ————  ————



12. South Indian Railway

On the 1st January 1891, lines owned by the then South Indian Railway Company were purchased by the State and handed over, together with the Villupuram-Guntakal State Railway, for working as one undertaking, to a new company – the South Indian Railway Company. The portion of the railway from Dharmavaram to Guntakal was made over to the former Southern Mahratta Railway in 1893.

With effect from the 1st January 1908 the Jolarpettai-Mangalore section of the former Madras Railway including the Tirupattur-Krishnagiri, Morappur-Dharmapuri and the Nilgiri Railways were incorporated in the undertaking South Indian Railway Company who from the same date, relinquished and made over to the amalgamated Madras and Southern Mahratta Railway Company, the 3'3³/₈" gauge lines from Katpadi to Dharmavaram and from Pakala to Gudur, and obtained running powers over the Madras-Bangalore section of the Madras and Southern Mahratta Railway. The Shoranur-Cochin Indian State line was, on the same date, also transferred from the former Madras Railway Company to the South Indian Railway Company for working. The Tirupattur-Krishnagiri and Morappur-Hosur Narrow Gauge lines were dismantled on 01.08.1941 and 01.11.1941 respectively.

The South Indian Railway Company's principal contract was terminated on 31st March, 1944, in advance of the date of first option, viz., 31st December, 1945, and the working of the South Indian Railway was taken over by the Government of India on and from 01.04.1944.

In the year 1950, just before the merger of South Indian Railway into the Indian Railways, the system comprised of :

Railway Section	Gauge	Miles
a) South Indian Railway	BG	559.19
b) Shoranur-Cochin Branch	BG	69.38
c) Cochin Harbour Branch	BG	4.07
d) South Indian Railway	MG	1,478.82
e) Nilgiri Branch	MG	28.96
f) Peralam – Karaikkal Branch	MG	14.65
g) Pondicherry Branch (French Territory)	MG	7.85
h) Tirunelveli-Tiruchendur Branch	MG	33.18
i) Travancore Branch (Tirunelveli – Sencottah Section)	BG	50.52
j) Travancore Branch (Sencottah-Trivandrum Central Section)	MG	97.64
k) Arantangi-Karaikkudi Branch (under construction)	BG	17.07
l) Diversion of BG Main line between Sular Singanallur to Coimbatore North ((under construction)	BG	9.20
Total		2375.53

The Nilgiri Branch has been covered in the chapter 14 on Nilgiri Railways.

In 1927, South Indian Railway built a BG line from Shoranur to Nilambur Road (41.28 mile). This section was opened in 3 portions from 3rd February 1927 to 26th October 1927. On 20th January 1941, the complete section was dismantled for sending rails for British War efforts in Middle East. Southern Railway rebuilt this portion only after Independence.

Shoranur to Ernakulam (65.02 miles) was opened for traffic on 16.07.1902. This line was built by Shoranur Cochin Railway Company and was the property of Cochin Government. Till 31st December 1907, this line was worked by Madras Railway Company. With effect from 1st January 1908 this line was handed over to South Indian Railway for working.



During the period from 1908 to 1950 South Indian Railway made further extensions on its MG system. The notable amongst are described below: -

- i) Extension from Rameswaram Road to Dhanushkodi (10.64 mile) opened for traffic on 10.12.1908. Mandapam to Pamban (3.12 mile) was opened for traffic on 01.01.1914.
- ii) Villupuram–Tiruchchirappalli Chord (107.57 mile) via Vriddhachalam was opened for traffic in parts from 01.12.1927 to 01.02.1929. Vriddhachalam to Cuddalore section (35.37 mile) was opened for traffic on 21.06.1928.
- iii) Vriddhachalam–Salem (86.19 mile) was opened for traffic in 1931.
- iv) Mayiladuturai–Thanjavur branch (17.96 mile) was opened for traffic on 25.11.1926.
- v) Podanur–Pollachi branch (24.48 mile) was opened for traffic on 15.10.1915. This branch line was built from the funds provided by District Board of Coimbatore. This was extended to Dindigul to join Tiruchchirappalli Madurai main line. Dindigul–Pollachi (75.17 mile) section was opened for traffic on 19.11.1928. Pollachi was also connected to Palghat by a line 35.07 mile on 01.04.1932.
- vi) Madurai–Bodinayakkanur (55.60 mile) branch line was opened for traffic on 20.11.1928.
- vii) Virudunagar Tenkasi chord (74.93 mile) was opened for traffic on 30.06.1927.

South Indian Railway inherited a major workshop at Nagapattinam built in 1860. This workshop provided most of iron works for construction of Great Southern of India Railway and South Indian Railway till 1928. In 1889 it

cast a bronze bell for the Chidambaram Temple. This bell continues to reverberate the life of Chidambaram town even in the new Millennium. In 1918, the Nagapattinam workshop cast another bronze bell. The Agent of South Indian Railway presented this bell 4 feet in height and about 2.5 tons in weight for the Rockfort Temple. The bell has got the following inscriptions:

G. CRIGHTON

LOCO & CARR. SUPT./S. I. R/NEGAPATTAM
1918

This bell rings at 4 hours, 6 hours, 10 hours, 12 hours, 18 hours and at 22 hours everyday. The sound of the bell can be heard all over Tiruchchirappalli city. This bell is hung in a Clock Tower typical of English origin and one can make a guess that along with the bell, the Clock Tower was also gifted by South Indian Railway to the City of Tiruchchirappalli.

In 1920, it was felt that a modern workshop should be built for South Indian Railway. Rs.3.18 Crores, a huge sum at that point of time was sanctioned for this work. Intense lobbying for the location of the workshop took place in 1920-21. Finally, the balance tilted in favour of a location near Ponmalai or Golden Rock as commonly known in railway circles. In 1928, the workshop was opened. In the year 2003 the Central Workshops at Golden Rock are celebrating its Platinum Jubilee. More about the development of Golden Rock Workshop is covered in a separate chapter.

South Indian Railway also managed the Peralam–Karaikkal branch, a part of which was in the French Territory. Peralam–Karaikkal (14.65 mile) was opened for traffic on 14.03.1908.

South Indian Railway Company constructed Tirunelveli–Tiruchendur branch (38.18 miles) on behalf of the District Board of



Tirunelveli as per Railway Board's notification No.2011 dated 16.07.1915. This line was opened for traffic on 24.02.1923.

South Indian Railway also managed Tirunelveli-Sengottai (56.52 mile) line on behalf of the Maharaja of Travancore. This section was opened in 1902-03. Extension from Sengottai to Quilon (57.71 miles) was opened for traffic in 1904. The line was extended to Trivandrum (36.51 miles) on 1st January 1918.

In addition to the above, South Indian Railway operated a few of the Narrow Gauge Lines. These included 73.31 mile long line from Morappur to Dharmapuri and from Dharmapuri

to Hosur. These lines have since been dismantled in 1941. Tirupattur-Krishnagiri branch line (25.38 miles) was opened for traffic in 1905 has since been dismantled in 1941.

A small 2.827-mile long tramway was built from Golden Rock to Sircarpalayam on 2' gauge in 1923. This was for transporting materials to pumping station at Sircarpalayam. It has since been dismantled.

On the auspicious day of Tamil New Year, 14th April 1951, South Indian Railway was merged into Southern Railway. The subsequent developments are covered in the chapter of Southern Railway.



Southern Railway ES 505, a 4-6-2, design built by M/s Kerr Stuart & Co. Ltd., Stoke-on-Trent, in 1922.
This locomotive was rebuilt with super heater.



Southern Railway LTS 2-6-4T 512, built by M/s W. G. Bagnall & Co. Ltd., Stafford in 1939.

13. Narrow Gauge Lines

At one time or other, ten narrow gauge lines were operative in Southern Railway or its constituent units. The author had the privilege of travelling on the narrow gauge line from Yeshvantpur (near Bangalore) to Bangarapet running via Chikballapur and Chintamani in early 1970s. By then all other Narrow Gauge lines were extinct. For posterity, the narrow gauge system is described in this chapter:

A. Bangalore - Chikballapur Light Railway (0.762 M Gauge)

This Railway was an enterprise by an Indian Company floated for the purpose under a guarantee from the Mysore Durbar of 4 per cent per annum on the subscribed capital. The Secretary of State for India sanctioned its construction in his despatch No.75-Railway, dated 10th September 1909. As the Company was unable to raise the entire capital, the Durbar under took to advance the balance of capital as joint owners of the Railway and gave the company the option of paying back the amount later on.

The line was joint property of the Bangalore-Chikballapur Railway Co. Ltd., and the Mysore Government till 6th April 1945. The Mysore Government as from 7th April 1945 purchased the interests of the Company. Thirty years after the first date of opening. The line was then entirely owned by the Mysore Government and was worked along with the Kolar District Railway as a Narrow Gauge system of the Mysore State Railway up to 14th April 1951 when it became an Integral part of the Southern Railway on its formation on 14th April 1951. Both these sections, however, came to vest in the Government of India on 1st April 1950 as a result of the Federal Financial Integration of the Indian States.

B. Kolar District Railway (0.762 M Gauge):

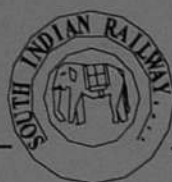
The first section, from Bowringpet to Kolar, formally known as the Bowringpet - Kolar Railway, was constructed by the Mysore Durbar under sanction conveyed in the Government of India foreign department, letter No.2161-I. -B, dated 15th October 1912. It was financed entirely by the District Board of Kolar from the Proceeds of a debenture loan. Later on as the District Board was unable to raise the entire capital for the whole line, from Bowringpet to Chikballapur, the cost was borne in equal proportions both by the Durbar and the District Board.

The line was the joint property of the District Board of Kolar and Mysore Government till 8th November 1946 on which date the Mysore Government purchased the interests of the Board.

The dates of opening of these two lines are:

Sections of Railway	Date of Opening	km
Bangalore-Chikballapur Branch -		
Bangalore City to Yeshvantpur	07.01.1918	5.36
Yeshvantpur to Yelahanka	01.02.1917	0.56
Yelahanka to Devanhalli	06.04.1915	23.66
Devanhalli to Chikballapur	01.08.1915	22.13
Sub Total		51.71
Kolar District Branch		
Bowringpet to Kolar	15.12.1913	16.91
Kolar to Chintamani	06.03.1916	47.94
Chintamani to Chikballapur	08.11.1916	37.45
Sub Total		102.30
Grand Total		154.01

The line from Bangalore ran through hill country and with the road competition, traffic dwindled. In 1970 there were 3 passenger trains



each way daily except on the stretch between Chintamani and Kolar where there were only two trains. Slowly and slowly the narrow gauge lines were converted to broad gauge. The position in 2003 is - a broad gauge line from Bangalore to Chikballapur and another spur from Bangarapet (Bowringpet) to Kolar serve the traffic needs.

A. Tarikere - Narasimharajapura Tramway (0.610 M Gauge):

The Government of India, under the provisions of the Mysore Tramway Regulation sanctioned the construction of this tramway, in the foreign department letter No.3225-I.V., dated 25th September 1913.

PROGRESS IN OPENING

Section of Railway	Date of Opening	km
Tarikere to Lakkavalli	22.05.1915	19.12
Lakkavalli to Narasimharajapura	15.05.1917	23.69
	Total	42.81

This line was constructed to open up state forests.

A. Tadasa - Heabe Tramway (0.610 M Gauge)

The Government of India in the foreign department letter No.1884-I.V. of 27th August 1917 sanctioned the construction of this tramway in Mysore by the Durbar, under the Provision of the Mysore Tram Way Regulation No.II of 1906.

PROGRESS IN OPENING

Section of Railway	Date of Opening	Km
Tadasa- Heabe	05.02.1921	15.45

This tramway was not opened for passenger or public traffic of any kind, but meant purely for goods (forests) traffic and hence was not included as an integral part of the Mysore Railway system.

This tramway was closed for traffic from 1st January 1949 and handed over to Mysore Public Works Department.

Mysore State Railway operated all these lines and provided rolling stock needed by them. Hughes C. Hughes gives a complete description of locomotives ever worked on these lines. From his book "Indian Locomotives: Part 3 - Narrow Gauge 1863 - 1940", details of these narrow gauge locomotives are given below:

MYSORE STATE RAILWAY

Nos.	Class	Type	CW (in)	Cyls. (in)	Makers	Makers Nos.	Date	All India Nos.
(A) Kolar District and Bangalore - Chikballapur Railways (2ft. 6 in gauge)								
1-2	A	0-6-0T	27	9½x15	KS	1304-05	1913	
3-5	A	0-6-0T	27	9½x15	KS	1352-54	1914	
6-7	A	0-6-0T	27	9½x15	KS	3022-23	1916	
8-10	E	4-6-2	39	12x18	KS	4237-39	1922	506/4/5
11-12	ES	4-6-2	39	12x18	KS	4358-59	1926	507-08
13	ES/1	4-6-2	39	12x18	KS	4425	1929	509
2-4	LT	2-4-2T	36	8x12	WB	2485-87	1933	510-11
5-6	LTS	2-6-4T	36	11½x18	WB	2593-94	1939	512-13
(B) Tarikere - Narasimharajapura Tramway (2 ft. gauge)								
21-22	B	0-6-0T	24	8¼x12	OK	7113-14	1913	23-24
23-24	C	0-6-0T	23	8½x11	KS	3086-87	1918	25-26
25-26	D	0-6-0	29	10x14	?		1925	

KS - Kerr, Stuart & Co. Ltd., Stoke-on-Trent. WB - W.G. Bagnall Ltd., Stafford. OK - Orenstein & Koppel AG, Berlin-Drewitz.



Starting with a simple 0-6-0 design, a competent Pacific type was introduced in 1922 with a super heated version in 1926. The Class E engines (ES with super heaters) were a distinctive and very attractive Kerr Stuart design with 39 in coupled wheels and 12 x 18 in cylinders. The LT were sophisticated little tank engines with rotary cam puppet gear while the LTS was much larger super heated design, with Walschaert's.

E. Morappur-Hosur Branch (0.762 M Gauge)

The line was the property of the Government. The former Madras Railway Company up to 31st December 1907 worked a portion of it, from Morappur to Dharmapuri, on behalf of Government. With effect from 1st January 1908, it was made over to the South Indian Railway Company for maintenance and working as an integral part of their undertaking under the contracts with the Railway.

The other portion, from Dharmapuri to Hosur was constructed by the Agency of the South Indian Railway Company from funds provided by the Secretary of State and as such, no portion of the capital expenditure on this section up to the date of its opening was debited to the capital account of the South Indian Railway Company. The capital account up to the date of its opening was kept separate for the Government of India. This section however, was worked and maintained by the South Indian Railway Company as part of their undertaking under contracts with that company.

The section from Dharmapuri to Hosur was closed for traffic on and from 31st July 1941 and the section from Morappur to Dharmapuri was closed for traffic on and from 31st October 1941, as the line was unremunerative.

PROGRESS IN OPENING

Section of Railway	Date of Opening	km
Morappur to Dharmapuri	18.01.1906	29.82
Dharmapuri to Hosur	15.05.1913	88.16
Total		117.98

F. Tirupattur To Krishnagiri Branch (0.762 M Gauge)

The line was the property of Government, on whose behalf the former Madras Railway Company up to 31st December 1907 worked it. With effect from 1st January 1908, it was made over to the South Indian Railway Company for maintenance and working as an integral part of their undertaking under the contracts with that Company.

The line was closed for traffic on and from 31st July 1941, as it was unremunerative.

PROGRESS IN OPENING

Section of Railway	Date of Opening	km
Tirupattur to Krishnagiri	18.09.1905	40.85

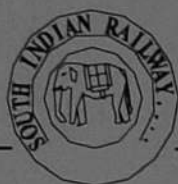
The 2-8-4T engines were smaller than their contemporaries on the BNR, (Bengal Nagpur Railway) weighing 34 1/4 tons with a 5 3/4 tons axle load compared with 42 1/4 and 6 3/4. The Tirupattur line had sharp curves and the engines worked cab foremost there to minimize damage to the track.

Mr. Hugh Hughes gives the locomotive details of these two lines as :

Nos.	Type	CW(in)	Cyls. (in)	Makers	Makers Nos.	Date
Q4, Q1, Q5, Q2*	2-8-4T	34	14x18	NB	16429-32	1904
Q6, Q3*	2-8-4T	34	14x18	NB	16539-40	1904
W1-W3	2-8-0	864 mm	360x420 mm	SLM	2312-14	1913
W4-W6	2-8-0	864 mm	360x420 mm	SLM	2737-39	1920

*SIR numbers: The original Madras numbers (class FA) are not known.

NB - North British Locomotive Co. Ltd., Glasgow SLM - Swiss Locomotive Works, Winterthur



G. Golden Rock-Sircarpalayam (0.610m Gauge):

A small 2ft. gauge tramway 4.55 Km. long was constructed in 1923 for carrying materials to the pumping station at Sircarpalayam. South Indian Railway built the pumping station for construction of a new major workshop at Golden Rock. Since it was not for public use it was not included in statistics. It is no more operative now.

H. Kulasekarapatnam Light Railway (0.610m Gauge):

These lines, covering the districts north and south of Kulasekarapatnam, was constructed for the East India Distilleries and Sugar Factories Ltd. of Madras. The local government authorized their use for public traffic by various orders from 1914 onwards. The managing agents were Parry & Co. of Madras. From 1918 onwards various "Rail motors" were also used many apparently converted from lorries, but the system was closed for traffic from February 1940. The details of rolling stock are:

Type	CW	Cyls.	Makers	Makers Nos.	Date	Wt.
0-4-0T	26½	5 3/4x10	?	?	By 1915	5½t
0-4-2ST	24	7x10	JF	14413-14	1915	9t
0-4-0WT?	34?	6½x12	OK?	?	Acquired 1916/18	7½t
Railcars		40HP	MR	1953,2073	1920/21	6t
Railcars		40HP	MR	2136-37	1923	6t

JF - John Fowler & Co. Ltd., Leeds.

OK - Orenstein & Koppel AG, Berlin-Drewitz

MR - Motor Rail Ltd., Bedford.

I. A privately owned 2ft. gauge line ran from Tiruvallur station to the nearby temple opened about 1905 and closed in 1939:

J. Mysore Iron Works operated 2ft. gauge lines with four 2-6-4T locos supplied by M/s. Baldwin Locomotive Works in 1919-20.

K. Maharaja of Cochin built a forest tramway, dealt separately as a part of annexure.

14. Nilgiri Railway

Nilgiri, Todas and Ooty

Udagamandalam, Ootacamund or its tight fitting pet name Ooty is situated in $11^{\circ} 25'N$ and $76^{\circ} 42'E$, in Nilgiri mountains near the tri-junction of the states of Tamilnadu, Kerala and Karnataka. Ootacamund is a corruption of Utaka-Mand, a mand or collection of quaint huts in which the aboriginal tribe of Todas lived. Todas antedated all explorers to the Nilgiris by a great margin of time. Nilgiri, Todas and Ooty though integrated among themselves have maintained their separate identity and have individually attracted a large number of tea planters, anthropologists and pleasure-seekers respectively.

In contrast to the far flung, snow capped Himalayas, Nilgiris or the anglicized Blue Mountains lack in awe inspiring grandeur, but this is compensated by lure-soft, subtle and persistent spirit of peaceful English countryside serenity.

Ootacamund discovered by English in 1820's was hailed with repute as a miraculous giver of health, even of life itself. 'It was like passing through the valley of Death to Paradise' said a Victorian subaltern as he gazed at the soft rounded bluish green hills. Lord Lytton, Viceroy from 1876 to 1880, while staying in the Government House in this paradise, wrote ecstatically to his wife: 'It far surpasses all that its most enthusiastic admirers and devoted lovers have said to us about it. The afternoon was rainy and the road muddy, but such beautiful English rain, such delicious English mud. Imagine, Hertfordshire lanes, Devonshire downs, Westmoreland lakes, Scotch trout streams and Lusitanian views.'

Yet for all this Ooty was not quite like England, the climate still had a touch of savagery about it. The rounded green hills so reminiscent

of home were cultivated by the strange Toda tribe, unlike any other tribe in India. Todas, the original inhabitants, believe that they have always lived on the Blue Mountains. They say that 'God dropped a pearl on a hill on the downs, now one of their most beautiful mands, and that out of this pearl come their god, Thakkirsi, who beat the earth with a cane. Out of the dust the first Toda was created and the first buffalo with a bell tied round its neck'. This legendary bell is an important religious edifice in one of their temples. Mollie Panter Downes, author of 'Ooty Preserved', supports the general theory that the Todas were part of the main Dravidian stream of India that retreated south from the conquering Aryans and were driven by some unrecorded events to the spirit guarded heights of the Nilgiris.

'Here on these Blue Mountains when the sun is shining,
Shining with a splendor that delights the eye:
Nature paints a landscape of her own designing,
Neath a glorious canopy of bright blue sky'.

And so Fred Barrie continues, 'Nilgiri' is derived from two Sanskrit words, Nilam meaning blue and giri a hill. The origin of the name, traceable as far back as eight hundred years, becomes apparent when these hills, rising cool and tranquil, are viewed from a distance enveloped in a peculiar blue haze that usually shrouds them.

The curtain rose on Ootacamund about four hundred years ago. Jacome Ferrieri, a priest of Syrian Christian community in South India was despatched in 1602 to take the World up in the hills. He and his men crossed wild, mountainous country full of tigers, elephants and other ferocious beasts. As they struggled higher, the cold filled them with horror. At a point about 12 miles south of where Ooty stands today, Ferrieri met his first Todas. Todas showed no curiosity about Christianity. Hopes vanished, Father



Ferrieri returned to the plains and Todas went back to unbroken peace for nearly two hundred years. Mr. Whish and Mr. Kindersley, assistants to Mr. John Sullivan, the Collector of Coimbatore visited the hills in 1818. They published an enthusiastic description of their journey in a Madras journal and poured their stories to the Collector. Sullivan visited the plateau in 1819, overwhelmed, returned again in 1820 to build the first permanent house at Ooty. This was the beginning; soon several other British officials grabbed a little place of their own in the Nilgiris. In 1827 a sanatorium was established for military invalids and in 1830, a military commandant was appointed to run the 'Ooty' settlement.

To quote Peggy Woodford in *Rise of the Raj*

"The British who toiled up through the dense malarial jungle to Ootacamund in the nineteenth century must have found the journey no joke. If you were young and vigorous, you rode. If you were older, or young and lazy, you could go by bullock cart or be carried in a palanquin". According to an early guidebook to the Nilgiris, the bullock carts averaged four and a half to five miles an hour, the horses did five to six, but they tired more quickly. The bullock-cart traveller's luggage was put in the wagon, boards were laid across the valises, and bedding was placed on the top. Reclining regally thereon, 'he was towed away, with stops for refreshment and rest at the dak bungalows. Or he could refresh himself having taken the precaution of seeing to it', as the guide book strongly recommends, that the sides of the bullock cart were fitted with pockets of coarse cloth into which could be stowed the wine, the beer, the brandy and the kettle."

To quote Mollie Panter Downes again –

'The Victorians enchanted with their discovery, developed Ooty, built little gabled cottages called Apple Cottage and Cheerful Cottage, turreted houses called Woodcut Hall and Grasmere Lodge. From the 1820s onwards, Madras families built their summer houses, and by the 1870s the Governor of Madras and his whole secretariat moved up to Ooty for the hot weather'.

The *Statesman* of June 21, 1884 gives an interesting news item, reproduced below: -

"The Madras correspondent of the *Pioneer* writes: There are some very scandalous stories afloat about land jobbing on the Nilgiris. Servants of the Crown, civil and military of high social and official standing, are publicly talked about as speculating in such very marketable commodities as cinchona: land, which to the ordinary planter is inaccessible at any price, seems to be taken up by elevated officials upon strikingly easy terms. The whole matter is notorious and offensive down here. How the authorities have managed to shield the offenders is very difficult to conceive. The Government is quite right to take active measures against so-called peccant Collectors. But what is sauce for the goose is sauce or ought to be sauce, for gander. If some inquisitive Member of Parliament, with a desire to confer a lasting boon on Madras, would ask for a return of all officials holding crop-producing land on hills, and see that Mr. Secretary Cross instituted proper inquiries instead of giving evasive or flippant replies, he would earn our lasting gratitude."

Ooty was becoming a favourite hill station around 1870s. Todas were receding year by year and now could be seen only in villages deep down the hills.



The Nilgiri Railway Company and its Successors:

From 1903 to 1907, the Mettupalayam – Coonoor line was worked by Madras Railway Company on behalf of the Government. With effect from January 1, 1908, it was made over to the South Indian Railway Company as a part of Jolarpettai – Mangalore section. After completion of Coonoor – Ootacamund line, it was also handed over to South Indian Railway for maintenance and operation.

The accounts of Nilgiri Railway section were separately maintained from 1908 to 1938. The hill-railway, 46.61 km long, began with a capital outlay of Rs.6.8 million and in 1938; the capital outlay was Rs.9.5 million. The gross earning in 1908 was Rs.0.37 million, peaked over a million in 1922-23 and then tapered to Rs.0.63 million. Till 1929-30, the Nilgiri Railway was a profit making system, the percentage of net earning hovering around 2 points. Nevertheless, the system was in sound financial condition for the first thirty years of its operation.

The principal contract of SIR was terminated on March 31, 1944, and the working, including that of Nilgiri Railway was taken over by the Government of India. With effect from April 14, 1951, SIR and Nilgiri Railway formed a part of the newly constituted Southern Railway. Though there is no separate entity as Nilgiri Railway since 1951, the hill line maintains its individuality and continues to be referred as 'Nilgiri Railway'.

Canvassing for a Rack-Railway System

Publication of technical papers in India commenced in Madras in 1860, but very soon it ceased publication. Next in line was the publication of technical papers from Roorkee in 1863 and continued for over two decades. The

Roorkee papers were known as 'Professional Papers on Indian Engineering' and were edited by the Principal of the Thomason Civil Engineering College, Roorkee. The circulation of these papers, incidentally the only one of such kind, was amongst the top notch technocrats and bureaucrats of the British India. These papers played an important role in moulding the opinions of the elite of that era. The Professional Papers, as per objectives laid out in 1863, would contain a) Original papers descriptive of works and scientific subjects, b) Official documents, reports and projects, c) Original designs and projects and d) Occasional translations and reprints of articles generally not accessible to Indian Engineers.

Major T. F. Dowden, R.E., published the first article on the Rigi Railway on the Ladder System in 1874, mainly by translation from the descriptions of one Prof. J.H.Kronauer. The history of rack railway (also known as ladder or cog system) was described thus:

'Mr. N. Riggensbach obtained a patent in 1863 in France for a system of mountain railways on the principle of the Ladder Rail. However till 1868 no one came forward to finance the scheme. In 1868, in U.S.A. upon Mount Washington near Boston, a similar railway with an ascent of 33% was started. Three engineers, thereon, Mr. Riggensbach (Mechanical), Mr. Naeff and Mr. Zschokke (Both Civil Engineers) associated to establish such a railroad on Rigi. From Luzerne Govt. they obtained a concession in 1869. A company was formed with a capital of £ 50,000 and a railway line of 3.26 miles with average ascent of 1:4 was constructed by 1871-72.'

Major Dowden published a letter from the Rigi Railway Company that they can assist any such project in India. Technical details of track, locomotive, and coaches were supplemented



along with suitable line sketches. Economics of the Rigi railway system was also mentioned in the article. This was the first attempt to publish information about rack-rail system for Indian Engineers.

The most ardent supporter of a rack railway for Nilgiris was Captain (later Major) J.L.L. Morant, R.E., and District Engineer of the Nilgiri District. In two long articles along with numerous plates (No. CLXV, July 1875 and No. CLXXXVI, January 1876), Captain Morant described the 'Central Ladder' system of mountain railway known more commonly as Rigi Railway. These articles included, a) a translation from German, the fifth Administrative Report of Rigi Railway Company for the year 1874, b) a translation from French, a report of M/s Riggengbach and Zschokke on the construction and working of a railway over the Arlberg on the Rigi Mountain.

In 1877, Captain Morant described the new Rigi cogwheel locomotive and commented that 'the rack-rail system has many points in its favour and we regard it as decidedly preferable in every respect to Mr. Fell's system of centre rail with horizontal gripping wheels'. Mr. J.B. Fell patented his central rail system in 1863; the first engine was also built in 1863 in Birkenhead but had no impact on Indian Engineers for mountain railways on the Indian sub-continent.

• In the next article (No. CCXXXI of 1877), Captain Morant gave a detailed analysis with the title 'Mountain Railway for the Nilgiri Hills'. It was no less than a Project Report. The estimate for the rack-rail line from Mettupalayam to Coonoor was £197,237 (Rigi system) and £ 302,452 (Fell system). This estimate included the cost of rolling stock also. The editor commented, 'Although the Government of India are not at present prepared to sanction at the expense of the State the railway above

referred to, it is possible that private enterprise may raise the requisite funds; and the question continues to occupy the attention of local officers. Captain Morant deeming that the reluctance of Government to undertake the railway in question was due in part to the want of complete information in regard to the cost and details of working of the several systems, has continued to collect further data, and to correspond with the most eminent pioneers of mountain railway construction in Europe.'

Major Morant in 1878 published two more articles – one on the Rack-rail system applied to a trunk line over the St. Gotthard. Another was a translation from German, original article was by Mr. N. Riggengbach, giving construction details of rack railway and their rolling stock. The article and 12 plates vividly described the system.

In 1877, the Governor of Madras Presidency, the Duke of Buckingham, got estimates prepared for an alternate proposal, a railway line from Mettupalayam to a point 2 miles north of Kallar and an inclined ropeway from here to Lady Canning's seat and another rail-line from the head of ropeway to Coonoor. This proposal was considered too hazardous and so dropped.

To quote from the Administrative Report of Indian Railways for the year 1880-81, 'the proposal for extension of the Mettupalayam branch to Nilgiri plateau was first mooted in 1875. It has now assumed a more definite character, a Company having been started in Madras to float the undertaking. It will probably be on metre-gauge, will have comparatively easy gradients from Mettupalayam to Kallar at the foot of the Nilgiri Hills, 5½ miles, and from thence up to Coonoor Ghat, 6½ miles, the gradients will be very heavy. The production of tea, coffee, and cinchona is still increasing on



the Nilgiri Hills, and it is anticipated that the traffic which will seek the line at once give a fair return. Traffic will be higher. In February 1881, permission was granted to the Agents of the Company to open out the existing track between Coonoor and Kallar to a width of 3 ft. through Government wasteland, but little work will be done until the company asks for fewer and more reasonable concessions. The matter is still under consideration'.

The Nilgiri Railway Company

In 1882, Mr. N. Riggensbach, came to the Nilgiris and started preparing detailed estimates for a rack railway, which it was calculated, would cost only £ 132,000. Major Morant of the Royal Engineers, who was then District Engineer, in the Nilgiris, and who took an abiding interest in the scheme, assisted him in this work. A local Company under the name "The Nilgiri Rigi Railway Company Ltd." was formed to construct the line and the Government gave it some encouragement and concessions in the matter of acquisition of the necessary land under the Land Acquisition Act and in laying a railway line from Mettupalayam to Kallar.

The Company, however, requested the Government to promise a guarantee of four per cent on an outlay of £150,000 for 15 to 20 years; but the Government was not prepared to comply with this request without reciprocal conditions. Finally, an agreement was reached between the Government of Madras and the Company as a result of which a limited guarantee was promised by the former.

The prospective investors of England were, however, not satisfied with the nature of the Government guarantee or the sufficiency of the estimates and thus the necessary capital for the proposed Company was not forthcoming.

The Company, therefore, requested the Government to modify its terms and lend the services of a British Engineer to scrutinize the estimates. As they could not afford to pay for the British Engineer, Mr. Richard Wooly of Coonoor agreed to advance some money on condition that he should be given contract for the construction of the railway line. His offer was accepted and from that time onwards began his connection with the Nilgiri Railway of which he eventually became the first Agent and Manager. This Company could not raise the requisite capital and was liquidated.

"The Nilgiri Railway Company" was formed in 1885 with a capital of Rs.2.5 million and the proposal for construction of a rack line was dropped for a short while in favour of an adhesion line, similar to the Darjeeling railway on a gradient of 1 in 30. However, very soon, the rack principle came to be favoured and in 1886 a contract was entered into between the Secretary of State for India, Government of Great Britain and the New Company. In 1889, the requisite capital was raised in London and in August 1891, Lord Wenlock the then Governor of Madras Presidency cut the first sod.

The original intention to have a direct rack railway on the Riggensbach system had by this time been dropped in favour of somewhat longer and more substantial line using the Abt type of rack rail. Rigi system uses a Ladder type or central rail with the toothed wheel engaging the runs of the ladder, the Abt system has two adjacent rails in the centre of the track with the teeth on the top out of step with each other. Perhaps the choice was made due to the recommendations made by Sir Guilford L. Molesworth, Consulting Engineer to the Government of India for the State Railways who in 1886 visited Harz Mountain Railway working on Abt System and strongly advocated this system



in preference to Rigi System. The financial health of the Railway Company deteriorated and construction work came to standstill.

At this stage, a new Company in the same title was formed in February 1896, which purchased the interests of the liquidated company and set about the task of completing the construction of the line. Another agreement was concluded between this Company and the Secretary of State for India, whereby all Government land required for the line was granted free and the Government gave a guarantee of three per cent on the capital during the construction period. The Madras Railway operated it under an agreement with the Government.

The Government purchased this line in January 1903, for Rs.3.5 million, although the capital outlay up to that time was of the order of Rs.4.9 million. The Madras Railway Company was asked to manage this railway line on behalf of the Government. Subsequently the management was entrusted with South Indian Railway on 31st December 1907 at the time of the expiry of Madras Railway's contract. The line was extended to Ootacamund from Coonoor in 1908 on the same gauge over a distance of $11\frac{3}{4}$ miles at a cost of Rs.2.44 million. The terminal station is now styled as Udagamandalam. The progress of construction is tabulated below :

Progress of Construction

Section	Date of opening	km
Mettupalayam to Coonoor	15-06-1899	27.34
Coonoor to Fernhill	15-09-1908	17.48
Fernhill to Ootacamund (Udagamandalam)	15-10-1908	1.79
Total		46.61

The Track Geography

The railway line from Mettupalayam to Udagamandalam is 46.61 km long and lies partly in Coimbatore District and partly in Nilgiri District of Tamil Nadu, on the eastern slopes of the Western ghats. Mettupalayam is at the foot of the hills with an elevation of about 330 metres and Udagamandalam on the plateau with an elevation of 2200 metres. The average gradient of this line is about 1 in 24.5. The rail-line is laid to Metre gauge (1000 mm).

The ruling gradient is 1 in 40 on the section between Mettupalayam and Kallar, and 1 in 12.28 from Kallar to Coonoor and 1 in 23 from Coonoor to Udagamandalam.

The sharpest curves on the section are 17.5 degrees. There are about 208 curves on the section, out of which 180 curves are 10 to 17.5, degrees. 76 numbers of curve lubricators have been provided on the sharp curves.

With the exception at Kallar, the facing points at other stations are non-standard with 1 in 16 crossing. At Kallar, 1 in $8\frac{1}{2}$ points and crossings is provided at the Coonoor end top point and 1 in 12 at the Mettupalayam end.

The track consists of 50-lb rails. On the rack section, wooden and steel trough sleepers are laid alternately.

There are 250 bridges on the section, out of which 32 are major and 15 are road over/under bridges. The total lineal waterway works out to 31.63 metres per km. The longest bridge is Bridge No. 25 at km 9/11-12 of 3 x 18.29m and 12 x 3.66 m girder spans.

There are 16 tunnels between Kallar and Udagamandalam, all of which are in excellent condition. Most of the tunnels are unlined. The



location (km from Mettupalayam) and their length (in feet) are tabulated below:-

Tunnel No.	Location (km)	Length (ft.)	Tunnel No.	Location (km)	Length (ft.)
1	9/10	113	9	17/10-11	100
2	11/10-11	64	10	19/5-6	66
3	12/3-4	274	11	19/11-12	205
4	12/7-8	154	12	21/3-4	312
5	14/6-7	64	13	23/12-13	230
6	14/9-10	260	14	38/9-10	250
7	15/3-4	290	15	42/5-6	176
8	17/8-9	108	16	44/7-8	451

The rack section commences from km 7/8-9 and ends at km 26/8-9. The rack rails consist of two toothed steel bars laid in a double row at 44 mm apart and 64 mm above the running rails so that the tooth of one is directly opposite to the gap of the other to ensure that the engine pinions do not work off the racks when negotiating curves. This gave it a common nomenclature of alternating biting teeth with acronym Abt, also the family name of the originator of Abt System. The rack bars are of two standard lengths i.e., full bars with 26 teeth of length 3.12 m and half bars with 13 teeth of length 1.56 m. The pitch of rack teeth is 120 mm.

The racks are laid at a constant distance of 455 mm from the inner rails (452 mm in the case of 25 mm thick rack bars) and are screwed by bolting to cast iron chairs fixed to the sleepers with fang bolts.

The rack bars were originally imported from England. This import continued till 1956-57 and thereafter, owing to stringent foreign exchange position at that point of time, import was not permitted, and mild steel IS 226 rack bars were used. Today the rack system consists of 50% of old high tensile steel 22 mm thick rack bars and 50% indigenous 25 mm thick mild

steel rack bars, obtained from the Railway Engineering Workshop at Arakkonam.

The entry to the rack is affected through a specially designed entry tongue laid in special channel sleepers fitted with bow springs and connecting links, which is connected finally to the rigid bars. At all stations, except the now closed Kateri Road, the racks are discontinued over points and crossings. At erstwhile Kateri Road station alone, until 1982, the points and crossings were provided with through rack system due to the steep gradients on either side.

The section from Mettupalayam to Udagamandalam is provided with stone ballast and the cushion varies from 75 mm to 150 mm.

It was originally proposed to locate the terminal station in Ootacamund at Charing Cross, but it was eventually decided in 1904 to construct it at the present place in St. Mary's Hill. This involved the re-alignment of the latter part of the line and the construction of an embankment across the Ooty Lake near Willowbund.

Trains are operated on the Nilgiri Railway on the Absolute Block System and the block instruments in use at the stations are of either Theobald or Neale's Tablet type. The stations are of Class B for block working and are equipped with rudimentary interlocking with Home signals only in each direction. Trains stop at each station and are not allowed to run through. There are no catch sidings or slip sidings provided at any of these stations. Engines are attached always at the Mettupalayam end of the formation, pushing the loads while going up. Each of the coaches and wagons are provided with a brakes-man who independently operates the hand brakes and the rack brakes on whistle codes obtained from the driver.



The stations of Nilgiri Railway and their height from mean sea level are given below:

Station	Distance (km)	Height (feet)
Mettupalayam	0	1069
Kallar	8	1260
Adderly	13	2398
Hillgrove	18	3580
Runneymede	21	4612
Kateri Road	25	5070
Coonoor	28	5616
Wellington	29	5804
Aravankadu	32	6144
Ketti	38	6864
Lovedale	42	7694
Udagamandalam	46	7228

Kateri Road Station was not in the original scheme and thus the 'Index Plan' of 1899 does not show this station at the time of opening of the section up to Coonoor.

The track is maintained in conventional style. 9 gangs consisting of one mate, one key man and seven gang men maintain the rack railway from Mettupalayam to Coonoor. Each gang has about 3-km long section under their charge. The track-gauge used by these gangs is custom made and with the same gauge, one can check vital dimensions of the rack-rails.

Sleepers are wooden or steel trough types. 15-16 sleepers per rail are provided for.

The Construction

The Nilgiri Railway is a feat of engineering, unique in many ways. The line is a metre-gauge, practically level for the first 4½ miles, to Kallar at the immediate foot of the hills. As soon as the train leaves Kallar, the rack rail

appears and the long climb begins. In the next 12 miles to Coonoor the line rises 4,363 ft. curving almost continuously as it clings to the mountainside, crossing lofty viaducts or tunnels through the hard rock. In this distance, there are thirteen tunnels, the longest being 137.96m (451 ft) in length. The gradient posts read 1 in 12½ with monotonous consistency.

Construction expenses were heavy; because in addition to the tunnels, a big bridge over the river Bhavani at the foothills was necessary. Besides this large bridge, 26 other bridges smaller in sizes were constructed and heavy expenditure incurred in rock cutting and blasting.

'Still it has been worth it'. To quote a South Indian Railway spokesman in 1935, 'Those engineers must have been lovers of nature when they decided on the alignment. Aside from the question of utility, the wee train as it winds its upward way, passes through a panorama of diversified scenery unrivalled anywhere; pausing frequently to refresh itself at stations, terra-cotta coloured and flecked with green, tucked snugly away amid the eternal quietude of these hills. Over deep ravines, lofty escarpments tower overhead, and the water of some mountain river hurling into beautiful cascades on its downward gambols: changing to scenes of peaceful rural simplicity. As the train tops the edge of the plateau and pursues its journey, stern crags fade into gently undulating hummocks, dotted with scattered villages; patches of cultivation fringed by tall and slender Eucalyptus trees, with perchance, a faint cool mountain breeze southing their lofty, tufted crowns, tuning in playful caprice, the bluish-silvery tinted leaves.'

The bridgework, the stone piers, abutments and arches are as imposing as they were built a hundred years ago, stone was abundantly used and the stonework was of excellent quality.



The line was built up to Coonoor through the Agency of Nilgiri Railway Company; the work was completed in 1899. Later, the extension of line up to Udagamandalam was built through the agency of Public Works Department. At that point of time, the assistance of army was also taken to complete the last bridge between Fernhill and Udagamandalam. The cement blocks indicate 'No. 11 Co., 2nd Q.O.S&M, 1907-8' in bold letters.

M/s T.S. Chinnaswamy, the contractors built the station building of Udagamandalam, the Contractors in 1909. It was then Ooty station. The first Station Master of Ooty was Bob Hill. Mr. Hill had an imposing personality. He remained the Station Master of Ooty for 21 long years from 1909 to 1930. His photograph, an impressive one, decorates the present Station Master's room.

After completion of Mettupalayam-Coonoor section, at the time of opening of the line, Nilgiri Railway commissioned M/s Boesinger, the famous photographer from Coonoor to capture the glimpses of the engineering marvel built by them. M/s Boesinger produced a thick album containing 22 photographs of 12"x10" size. An index plan, a suitable emblem, major technical details and a list of senior officers of Nilgiri Railway were also added in the album. Some of the photographs of Boesinger are reproduced in this book. The photographs were taken in 1898 and 1899.

The emblem of Nilgiri Railway contains the following inscriptions in Latin:-

SIC ITUR AD OOTY
VESTIGIA NULLA RETRORSUM

In 1928, Nilgiri Railway faced a severe calamity. A number of bridges collapsed and the restoration was a stupendous task. Rao Sahib H.J. Bellie Gowder, Contractor from Aravankadu,

a Nilgiri town, did Restoration. The devastation was repeated in 1930 and so was the restoration by Rao Sahib. On both occasions, M/s E. Lavocah, the Coonoor photographer was commissioned to recapture the great job done. A few photographs from the two albums are also reproduced in this book. Most of the photographs in these albums are of 8"x5.5" size.

The Journey

The journey to Nilgiri in the steam train has been an exciting feature from 1899 onwards. I too have been to Nilgiris in the steam train on a couple of occasions over the last 40 years. This is how Sandeep Silas describes the journey in 1999:

"The mountain railway weaves its way for 46 km over a journey lasting approximately four and a half hours between Mettupalayam and Ooty, but fills so much beauty, brings so much freshness, that is enough intake for a lifetime. Since October 1908 this Nilgiri wonder is running on steam engines happily joining hearts and bringing cheer to an otherwise melancholy existence. The existentialist philosophers would sure have learnt a lesson of joy, had they come here before propagating their wise philosophies.

The journey begins with coffee and tea plantations. There, beyond the luxurious bushes, supple young women can be seen plucking the tender leaves with an immense swiftness. The sun playing hide and seek through the clouds, rays dancing upon bright faces weaving patterns in gold and silvery white, presents a comforting picture. The monotony of the bushes is interrupted by bright splashes of colourful attire. When the train stops at a quaint wayside station like Hillgrove, you wish to wander in the groves and feel the tenderness of the new born leaves.



The shrill whistle of the steam engine, which spirals in rising intensity will break your reverie and hearken you back to an onward climb. As the toy train rises on mountain heights, dense forests occupy the pride of the place. When the train takes a turn deeper into the mountain range, suddenly you find yourself surrounded by a spurge of green. It is as if you are in a pre-historic period, having travelled back in time. Sporadic bird calls and a surprised hum of insects round the next bend leave you touched. No wonder there still exists some ancient tribes in the Nilgiris like the Kotas, Kurumbas, Panias, Irulas and the Todas. The travels of the mind into the future like those of H.G.Wells fall into a reverse gear, once here.

The rhythmic clatter of metal wheels over steel tracks slowly unwinds a traveller, as the train laboriously winds itself around high mountains. The breeze gets chiller with the rise, and the freshness of air opens up the closed pores of skin. When the train stops at a tavern like station, you notice while sipping a hot cup of tea, that there are rack bars in between the two rails. This is called the rack and pinion system, and provides for extra adhesion required by the "old fellow" to draw the trainload over the steep Nilgiris.

About time and the stations of Runnymede, Kateri Road and Coonoor come as pleasant little bird-nests on the journey. If you intend to break journey at Coonoor, 1712 m above sea-level, for a look at such charming places like the Dolphin's Nose, Lamb's Rock, Lady Canning's Seat or Law's Falls, you will definitely be a wiser man after witnessing such feats in the mountain wilderness. Simm's Park and Ralliah Dam are other enchanting places to visit. Not to be left behind, Wellington and Lovedale too offer to viewers pleasant surprises of deep ravines and cascading green. Names are funny around here like at Kotaigir, a place

near Ooty has a St. Catherine Falls, albeit not literally. It is so amusing a thought, as to how the funny and the beautiful combine in such harmony. ↴

Sometimes on this journey, your thoughts disappear amidst a fulfilling green splashed on one of your sides, or on the other side in a deep valley holding a rushing brook, anxiously hopping over rounded porous stones. You wish to leave the world and sit on a cold spherical stone, feet submerged in flowing waters and a blank mind. Alas! The call of Ooty is far more attractive than fleeting glimpses.

Once the train emerges at Ooty, 2240 m above sea-level your eye fills up with an expanse so magnificent that the artist in you comes alive."

At Hillgrove station, a plaque gives information of a calamity of 1993 thus:

"History of calamity – The day of 11.11.1993 witnessed most devastating disaster in the history of Nilgiris when a portion of hill at Rasappalam slipped, down in the torrential rains that lashed over Nilgiris. Tens of thousands of cubic metres of earth and boulders that slipped took away along with it the ill-fated people of Dargab and few houses on the slope serene valley. The recorded rainfall of 333 mm washed away 200 Mts. of railway track, long stretches of road at several places, the track stripped of its formation, was reduced to a mere skeleton of hanging rails with sleepers. The enormous quantity of earth and boulders that pounded over railway track and road caused heavy damages disturbing both the rail and road traffic of Nilgiris. Rehabilitation of half a kilometre of track, clearing of 20000 m³ of earth and boulders, 10000 m³ of earthwork and building of 3 bridges was really a herculean task. The team of railway engineers and staff with their engineering excellence worked day and night and the



passenger traffic, which remained, suspended since 11-11-93 was resumed to normal on 12.02.94. The temporary restoration incurred an expenditure of Rs.1.6 million.

The permanent restoration, which has taken to this shape included construction of 3 RCC box culverts, 140-m length of retaining wall and large quantity of protective earthwork to provide necessary formation of track. The permanent restoration project is estimated to cost Rs.3.5 million."

Kallar, a place between Mettupalayam and Hillgrove is no more a passenger station, though all trains stop here for the engine to rake the fire and also to fill its tanks with water. Kallar marks the beginning of the rack railway. At Kallar the brakes-men take the charge of respective coaches using hand brakes and rack brakes. Brakesmen are part of the running staff and are paid running allowance like any other driver or guard. The driver operates vacuum brakes on coaches. The brakes-men work on the whistle code from the driver. Three short whistles will ask for application of brakes while one long whistle asks for release of brakes.

Maximum permissible speed on the section varies; (i) between Mettupalayam and Kallar – 30 km/h., (ii) between Kallar and Coonoor – 13 km/h. and (iii) between Coonoor and Udagamandalam – 25 km/h.

During the journey, a visitor cannot miss the beautiful cast iron plaques (12" x 6" rectangles) installed at the mouth of tunnels indicating Nilgiri Railway's insignia and the year of opening of tunnel. The tunnels are without lining and show a good façade of the basalt rock.

Addeley, another station between Hillgrove and Coonoor is no more operative now, though the train stops for the engine to have its belly full of water.

The train normally consists of a first-class coach at the front, followed by a first/third composite, three thirds and a van, with the locomotive pushing at the rear. At the "uphill" end of each coach there is a small open platform on which a brakeman stands. As the train approaches each station, the man on the leading coach holds out a red or green flag to indicate the position of the signal arm. This gesture is repeated from coach to coach until acknowledged by a blast on the whistle from the engine driver, who cannot see the actual signal because of the curvature of the line. The third class is now renamed as second class, though without any up gradation.

Mettupalayam

Mettupalayam was a small village on the bank of river Bhavani in 1850s. After Ooty became a hill resort for the British rulers of Madras Presidency, it came into prominence. Only 5 miles from the foothills, it was but natural to be chosen as the point of start for any journey to the hills.

It is interesting to note that in 1874, proposals were made to build a line from Mettupalayam to Ootacamund on the Larmanjet Single-Rail principle, as adopted for the Lisbon Steam Tramways. Some believe that this was not the first. Even earlier in 1854, a proposal was mooted to lay a series of double rail incline planes up the slopes and pull loaded wagons over them by a counter weight of tank wagons filled with water and connected to the loads by a rope running a round wheel at the top of the incline.



Mettupalayam gained importance in 1873, when a line on broad gauge (5 feet 6 inches) from Coimbatore was built with its terminus at Mettupalayam. B.G. trains started plying from Madras to Coimbatore and then to Mettupalayam.

Three broad gauge trains including Nilgiri Express from Chennai (Madras) terminate at Mettupalayam, given attention and originate for their return journey on a common day. These connect with two metre gauge trains to Udagamandalam. Between Coonoor and Udagamandalam there are two more pairs of trains. Trains are well patronized and the traffic potential is immense.

Mettupalayam is the major carriage and wagon depot handling the metre gauge stock. Major overhauling of the stock is also carried out here.

At Mettupalayam, one can observe wagon stock of 1907 vintage with neat axle box covers depicting the vintage year as well as 'Madras Railway Company', the then owner of the stock.

The Coaching and Freight Stock

The coaches and wagons are bogie stock. Initially, the coaches were wooden bodied, with canvas roof and windows. Subsequently, the roof and windows were also changed over to wood. In the last few years, twelve coaches have been converted to steel body, similar to bus body construction. One of these coaches has been converted as luxury tourist coach with 12 seats. There are 31 coaches, plying on Nilgiri Railway at the turn of the century. Most of the coaches were built in 1931-32 and rebuilt subsequently.

The coaches are 11.516 meters long over buffers. The width of under frame is 2.15 meters. The rigid wheelbase of the trolleys is 1.24 metres

(4'-3"). The coaches have no toilets. At the leading end of the coach, there is a verandah. The hand brake wheels for adhesion brakes and pinion brakes are located here. The brakemen stands on this verandah and operates the hand brakes as required by the driver. The coaches are provided with 24 volts lighting, connected to batteries in the Guard's brake van. These batteries are charged, when the brake vans are stabled at Mettupalayam, Coonoor or Udagamandalam. When the train is entering the tunnels, the guard of the train switches on the lights.

The leading axle of the coach is fitted with a pinion wheel, mounted over bronze liners and lubricated by oil. The pinion wheel is free to rotate on the axle. On the right hand side of the pinion, there is a brake drum integral with the pinion. The pinion brakes can be applied by the brakes-man, to arrest the rotation of the pinion. When the train is on rack section, if the pinion brakes are fully tightened, the rotation of the wheel is arrested. In the non-rack section, when the pinion brakes are applied, it has no effect on the rotation of the wheel. Since the pinion wheel is free to rotate on the axle, the pinion gets automatically engaged to the rack rail at the rack entry. The adhesion hand brake and pinion brake together provides a braking force of 190% of the tare weight.

The axles are plain bearing type with oil soaked cotton waste packing. The coaches are fitted with helical springs at the primary suspension and elliptical springs at the secondary suspension. Jones type buffer couplers were fitted as original equipment, which are now replaced by IRS Metre Gauge buffers.

The present fleet of wagons consists of 11 wagons, of which six are covered wagons used for coal transport and five open wagons used for movement of rails, sleepers etc. All these wagons were inducted between 1929 and 1936.



The bogie trolley of the wagon is 1.24 metres (4'-3"). The suspensions and brake arrangements are similar to coaching stock. The pinion wheel of the wagon is fitted to the bogie headstock.

Coonoor

Coonoor is situated in $11^{\circ} 21' N$ and $76^{\circ} 48' E$, 6000 feet above the Sea at the south-east corner of the Nilgiri Plateau, and at the head of the principal pass from the plains. Up this Ghat run a road (21 miles long) and a rack railway ($16\frac{3}{4}$ miles) from Mettupalayam in Coimbatore District. The place was constituted a municipality in 1866. Coonoor is the headquarters of a divisional officer, and at the turn of the century it had a stationary sub-magistrate's court, a hospital, four places of worship, many schools, a library and shops and hotels for the convenience of Europeans visiting it. In the neighbourhood are several tea and coffee estates.

Coonoor was one of the principal sanatoria of the Madras Presidency, second only to Ootacamund in natural advantages. The town is built in one of the loveliest sites in India, on the sides of the basin formed by the expansion of Jakatala Valley, at the mouth of a great gorge, and surrounded by wooded hills. It possesses a cool and equable climate. The rate of mortality is remarkably low, and no particular ailments are characteristic of the place. The place has excellent roads and several beautiful drives, along the sides of which grow hedges of roses, fuchsia, and heliotrope. Views of the precipitous sides of the deep valley up which the Ghat road climbs, of the forests and the farther slopes, and of a wide expanse of the plains shimmering in the heat 6000 feet below are magnificent.

Coonoor remained a terminus for the Nilgiri line for eight years. The Government of India constructed the extension from Coonoor to Ootacamund, and the line was opened up to Fernhill on September 15, 1908 and up to Ootacamund a month later. Rack system was discarded for this extension though the ruling gradient is as severe as 1 in 23.

The author witnessed Coonoor humming with activity in the last week of January 1984. *A Passage to India*, the famous novel of E.M. Forster was being filmed in Ooty and Coonoor. 'X' class Locomotive number 37395 was repainted in black livery and christened as 'Chandrapore 103' of Malabar line to haul the train for the journey of Lean's troupe. To quote the *Time*, of March 19, 1984; 'British Movie Director David Lean is such a fan of the Mettupalayam-Ootacamund run that he chose it for the rail scenes in his forthcoming feature film of E.M. Forster's 1924 classic *A Passage to India*. Using 27 ancient passenger carriages pulled by equally venerable steam locomotives, Lean promises that train shots, in which Indian actor Victor Banerjee (or his double) swings along the outside of the train as it chuffs over a seemingly bottomless gorge, will be more dramatic than the railroad episodes in the director's memorable 1965 film 'Doctor Zhivago'.

Locomotives

HUGH C. HUGHES has a special interest for the steam locomotives and he has covered all locomotives ever steamed on Indian soil in one or other of his books. In November 1967, his article, 'Ascent to Ooty' appeared in 'The Railway Magazine'. Extracts from this article:



'First engines to work on Nilgiri Railway were small 2-4-0T Beyer Peacock ones with 4 cylinders—2 normal and 2 working cogwheels.

Powerful engines were needed for the steep gradients and, as a 50 lb. per yard rail was used, the government relaxed the rules for metre gauge railways and allowed an axle load of 12 tons on this line but restricted the gross weight to 35 tons. The original Beyer Peacock design was therefore not really powerful enough and the maximum load had to be limited to 45 tons. Moreover, even when arrangements were made to carry extra fuel and water (which brought the weight over the stipulated maximum), the engines had to refuel halfway up the incline to Coonoor and arrived at each station with the water tanks almost empty.

In 1900, the Indian Government agreed to the use of engines with a gross weight of 45 tons and in due course the larger class "S" appeared, followed in 1910 by the "P" Class with eight coupled wheels, the maximum load being increased to 65 and 70 tons respectively for these two types.

Meanwhile, for working the extension to Ootacamund, four second-hand Fairlie locomotives were obtained from the North Western Railway. Part of a batch built in 1880 for a line on the North West Frontier which was not in fact constructed, they had been used briefly on a later frontier line in 1886-87 and had then laid idle for 20 years before turning up in South India. They could barely manage to cope with the traffic and, after proposals to electrify the entire Nilgiri line had been turned down because of the cost, it was decided to use rack locomotives over the whole route from Mettupalayam to Ootacamund, working them as ordinary adhesion engines above Coonoor.

In 1911 the South Indian Railway Locomotive Superintendent, W.B. Reynolds, on his way back from special duty in England, visited Switzerland and studied the types of locomotives in use on the mountain railway in that country. Two years later orders were placed with the Swiss Locomotive & Machine Works, Winterthur (SLM), for a new series of engines to be known as Class "X".

These 48-ton locomotives were superheated and were built to metric dimensions. They also differed from all the previous types by being compounds, with all four cylinders (and the complicated Walschaerts valve gear) outside the frames. The two low-pressure cylinders drove the rack pinions and could be cut out, by means of by-pass valves, on the sections without a rack rail. When working compound, the work done by the two pairs of cylinders was equalized automatically and only one regulator was required. Incidentally, one of the first batch (X-1) had the misfortune to be waiting shipment at Hamburg in 1914 when the war broke out and it was not put into service in India until 1920. The class was highly successful, and the 1952 series differed from the earlier engines only in minor details; the maximum load for this type is 100 tons'.

The locomotives are painted in an attractive shade of blue, lined out in yellow, with the divisional emblem on the side tanks; some of them have additional embellishments, including appropriate names such as Mountain Jewel (37392) and Hercules (37395) on rectangular plates attached to the handrail about the tanks. There was also the immaculate little Shuntmaster, a 0-4-4 tank of South Indian Railway origin, which busily puffed around the



yard at Mettupalayam. The status of locomotives of Nilgiri Railway in June 2003 is :

N.M.R. Class & Nos.	I.S.R.Nos.	Type	Maker	Maker's No.	Dates	Remarks
R 1-4	..	2-4-0 T	BP	3875-73925	1897	Withdrawn 1923
S 1-2	..	0-6-2 T	NB	16464-5	1905	Withdrawn 1925/9
I 1-4	..	0-4-4-0 T	AE	..	1880	From NWR 1908. Withdrawn 1914-15
P 1-4	..	0-8-2 T	NB	19022-5	1910	Withdrawn 1924
X 1	37384	0-8-2 T	SLM	2456	1914	At GOC shops for repairs.
X 2-6	..	0-8-2 T	SLM	2457-92469-70	1914	Withdrawn
X 7-10	37385-8	0-8-2 T	SLM	2734-62733	1920	37386 working ,others withdrawn
X 11-12	37389-90	0-8-2 T	SLM	3000-1	1925	37389 at GOC for POH, 37390 preserved at Coonoor
X 13-17	37391-95	0-8-2 T	SLM	4069-73	1952	37394 withdrawn, others working
A 42	37349	0-4-4 T	YE	1294	1916	Preserved at GOC Workshop

BP - Beyer, Peacock & Co., Ltd., Manchester.

NB - North British Locomotive Co. Ltd., Glasgow.

AE - Avonside Engine Co. Ltd., Bristol.

SLM - Schweizerische Lokomotiv - und Maschinenfabrick, Winterthur.

YE - Yorkshire Engine Co. Ltd., Sheffield.

On June 2003, Nilgiri Railway had 5 working locomotives Nos. 37386, 37391, 37392 37393 and 37395; Two locomotives (nos.37384 and 37389) are at Golden Rock Workshops of Southern Railway and one locomotive No.37390 is preserved at Coonoor. The oldest Workhorse is 37384 of 1914 vintage. Two-diesel locomotives YDM-4 Nos. 6153 and 6481 work trains between Coonoor and Udagamandalam.

Effective braking was a problem. The engine brakes were quite complicated; Chatelier counter pressure brake on both the rack and adhesion cylinders, automatic vacuum brakes acting on all six wheels, hand brakes on coupled wheels and hand brakes acting on the rack

pinion shafts were provided on 'X' class locomotives.

The SLM booklet suggests the following sequence of braking a train in the down gradients : -

- (a) Air compression brake on rack only:
 - (i) With the engine running downhill backwards, set the reversing screw nut to the forward position to the very end.
 - (ii) Open the air inlet valve
 - (iii) Set the intercepting valve on Adhesion position
 - (iv) Two-receiver valves 'low pressure' and 'high pressure' now control the braking effect of the air compression brake. By shifting these valves gradually, the braking effect is reduced to a minimum



- (b) Back pressure brake on adhesion only: -
- (i) With the engine running downhill backwards, set the reversing screw nut to the forward position to the very end.
 - (ii) Open air inlet valve into 'air compression brake'.
 - (iii) Set the intercepting valve on Adhesion position
 - (iv) Braking effect will be controlled by hand wheel marked 'high pressure'.

To sum up, most air is drawn into cylinders when the high pressure and low-pressure cylinders are working independently. Injection of cooling water into the cylinders can be done separately depending on the temperature and pressure in the cylinders.

In spite of such elaborate braking system adopted on Nilgiri Railway, a serious accident took place on February 21, 1982 when the coal special rolled back killing 8 persons including 6 railway men. Following this, the train services were abandoned for almost seven months and every aspect of working was thoroughly examined by a committee of senior officers. Years of neglect were the cause of the accident.

To quote Indian Express of July 23, 1981: -

"When I alighted from train on this platform on February 15, 1935", recalled a retired sub-inspector in a voice choked with sorrowful emotion, "it took almost thirty minutes for me to get out of the station with my luggage. So much was the crowd". A disquieting rumour that is spreading like wild fire these days in the Nilgiris is that the Nilgiri Railway is close to closure. It is being done by (i) cancellation of goods services, (ii) awarding of out-agencies for the movement of goods, (iii) cancellation of passenger trains, (iv) persistent negligence towards maintenance of locomotives and other aspects of railway and (v) transfer of personnel".

Nilgiri Railway had a period of neglect. The Commissioner of Railway Safety, Southern Circle attributed this accident to

- (a) lack of quality control in the manufacture of rack bars;
- (b) decline in the loco's pinion-drive mechanism allowing substantial wear on the teeth of cog-wheels;
- (c) progressive neglect of fixtures, fastenings, chairs, etc.

This neglect was made good in the six months after the ghastly accident of February 1982. 150 gang men, 15 mates and 3 inspectors renovated the complete infrastructure. They renewed 1989 rack bars, 2317 sleepers, 12861 chair bolts, 8952 rack bolts and turned 2962 rack bars. All versines were corrected and all bridges were attended to. A rack-bar-straightening depot was also set up at Kallar.

The locomotives were also thoroughly attended to. Locomotives of new lot, 1952 make, are only allowed to work on the rack portion, as they are more adaptable. To quote SLM booklet, 'the two rack driving wheel rims are no longer solidly bolted to the hub. They have a small clearance on the hub, the torque being transmitted to them by insertion of eight pairs of spring elements between hub and rim. Thus the rack driving rims has a relative, but limited tangential motion of $3/8'$.

Locomotives for the New Millennium

Nilgiri Railway is having a difficult time with the age-old steam locomotives. In 1999, there are only four locomotives with cogwheels in working order. They work trains between Coonoor and Mettupalayam. Two YDM₄ diesel locomotives haul the trains on the non-rack portion between Coonoor and



Udagamandalam. The problem was being felt for last two decades, though its severity is from 1995 onwards. A number of proposals were discussed at various levels. M/s Swiss Locomotive and Machine Works did submit their proposals for an advanced steam locomotive and also for a diesel-electric locomotive, both suitable for rack and adhesion systems. Their proposals were not considered due to very high cost. Instead Railway Board decided that Southern Railway should design and rebuild one locomotive with oil firing system.

OIL FIRED STEAM LOCOMOTIVES

The existing 8 locomotives are over 50 years old. The Railway Board wanted to replace these locomotives with imported ones; the cost quoted by M/s Swiss Locomotive Works was about Rs.30 Crores per locomotive with oil fired combustion system. This loco was steam driven using light diesel oil. On cost considerations, this tender was dropped. Southern Railway was then asked to convert the existing locomotives into oil fired ones. With this background, a project was started in the year 2000 to convert one of the existing locomotives from coal firing combustion system into oil firing combustion system.

Stage I:

The basic work of conversion was entrusted to M/s TREC-STEP, Tiruchchirappalli, for supplying the requisite equipment for this purpose and also commission one locomotive at a total cost of Rs.27 lakhs. The firm supplied majority of the equipment and commissioned them. The Staff and Supervisors of Coonoor loco shed and M/s TREC-STEP engineers conducted a number of trials with High Speed Diesel oil as fuel. This loco No.X 37395 was commissioned to work with High Speed Diesel oil as fuel during

September 2002. Further modifications were carried out to use furnace oil by suitably incorporating pre-heating arrangement in the fuel tank and oil supply line to the burners.

In the first stage itself, the adoption of oil fired combustion system was successfully completed and introduced in the Nilgiri Mountain Railway steam locos.

Stage II:

In order to further bring down the cost of operation, the staff and supervisors of Coonoor Loco Shed further worked and evolved a blended fuel oil consisting of 1/3rd of furnace oil, 1/3rd of used drained lube oil from diesel locomotives and 1/3rd of waste oil recovered from the drainage discharge water from effluent treatment plants set up in diesel sheds. This blended oil is now used as fuel oil in the Nilgiri Mountain Railway oil fired steam locomotive. By this innovation, the fuel cost is now brought down to 1/3rd of the initial furnace oil cost as the remaining 2/3rd is comprising of used lube oil and recovered waste oil from drainages of diesel sheds. Now the fuel cost of operation is much cheaper than the comparable coal operated steam locomotives. To make this possible, Southern Railway incorporated some system modifications in the original equipment so that all types of mineral and bio-oils including the waste by-product oils even with water content (to an extent of 25%) can be used as fuel oil.

Advantages of these innovations are:

1. Cleaner combustion and less emission of harmful pollutants.
2. Avoidance of human drudgery connected with coal fired locomotives in feeding continuously the coal.



3. Elimination of ash and cinder generation connected with steam locomotives and consequent environment pollution.
4. Improvement in overall journey time by elimination of fire cleaning at regular intervals.
5. Reduction in manpower of one fireman i.e. two firemen are used in coal fired steam locomotives and only one fireman is used in oil fired steam locomotive.
6. Increased revenue earning by hauling 6 coaches by oil fired steam locomotive as against an average of 4 or a maximum of 5 (occasionally) coaches by the coal fired locomotives.
7. The cost of operation of the train is brought down considerably and is cheaper than the cost of operation with coal.
8. High cost of import of similar locomotive is avoided by developing a superior and cheaper indigenous system at almost 1/100th of the import cost.
9. The heritage value of the steam locomotive is being retained while the whole locomotive is modernized with the latest technology.

X-37395 regularly work trains on Mettupalayam-Coonoor section. The innovation on this locomotive was adjudged the best for the year 2002-03 and won an award of Rs.3 lakh from the Railway Board.

C. Electric Traction for Nilgiri Railways

Mr. Nitish Kumar, the Honourable Minister for Railways, in a public function on 15th June 1999, announced electrification of the Nilgiri Railway. It appears to be romantic idea though the economics may not justify it. Another

aspect will be heritage. Should the steam locomotives continue or the new diesel or electric locomotives replace them?

What we gain in terms of speed can easily be offset by the loss of the charm of steam black beauties. Will electrification affect the ecology? Will elephants frequenting NMR track have the safe passage under electric traction? Will the electric traction be able to gear up with constant landslides? These are a number of questions, which will have to be addressed before a final decision is made. The Heritage Committee set up by the Railway Board is up in arms against electrification and favours oil-fired locomotives as a long-term perspective.

SLM, the pioneers of locomotive builders for rack-rail system made a comparative study of steam and diesel traction. Their conclusion—steam will be a superior traction than diesel, will also hold good when compared with electric traction.

An essential factor for the selection of the type of traction power is the level of overall costs. Investment costs are in favour of the steam engine at about 70-80% compared to the diesel locomotive's price and will be a fraction when compared to the cost of electric traction. The gap becomes still wider when the costs for personnel training, new workshop facilities and spare parts are included.

For the diesel locomotive the fuel costs are slightly less than for steam. With regard to track loading and hence maintenance, the steam engine is clearly superior because the rack loads are only around one-third of those of the diesel locomotive. As for locomotive maintenance, the steam engine can be overhauled entirely in the railway workshop, without recourse to specialists from outside. While the major overhauls of the diesel locomotive may have to be carried out



jointly with the makers of the principal components, because the diesel power unit and electrical equipment demand special facilities.

Finally, when speaking of a railway with touristic function the attraction of steam must not be forgotten: it is capable of attracting additional passengers. The author talked to a number of rail-enthusiasts and everyone favours steam traction (with oil firing for easy operation). Some believe that Indian Railways have the capacity and capability to design and build their own locomotives for Nilgiri Railway at a cost comparable to the foreign offers. May be, one of the old workshops takes it as a challenge and confirms our faith in Swadeshi (Indian) system.

Centenary Celebrations of Nilgiri Railway

In 1996, a few of the railway enthusiasts with passion for history formed 'Centenary Celebration Committee' under the Convenorship of Dr. G.V.J.A. Harshavardhan. The Committee decided to celebrate centenary for the Coonoor Railway station sometime in 1997. This group of enthusiasts without much support from the organization managed to impress on 'one and all' the necessity of preserving the beautiful Coonoor station. The Committee was able to muster good support. Their voluntary efforts culminated in celebrating 'Coonoor Railway Station Centenary Day' on 18.12.1997.

The Centenary Celebrations of Coonoor station created a favourable atmosphere for the Nilgiri Railway. In June 1999, it was a big affair presided by Mr. Nitish Kumar, Honourable Minister for Railways. The official report of the Centenary Celebrations is reproduced below:

'The Nilgiri Railway completed one hundred years on June 15, 1999 when centenary celebrations were held at the Coonoor Railway station.

Participating at a colourful function to mark the centenary year, Shri Nitish Kumar, Minister of Railways, gave a categorical assurance that the Nilgiri Mountain Railway (NMR) would never be dismantled and the popular hill train would keep chugging on. "Though the operations are not economically viable, the Railways will spare no efforts to keep the system working, taking into account the antique and heritage value of the system and also the interests of tourists, we have to maintain this at any cost", the Minister said. The Minister also disclosed the government's decision to electrify the Coimbatore-Mettupalayam-Udagamandalam route and said the preliminary survey would commence soon. The NMR would be modernized and maintained properly, he added.

The Minister also announced that Coonoor railway station would be computerized to commemorate the centenary celebrations of NMR.

To mark the occasion, Shri Nitish Kumar on a unveiled a plaque and a steam locomotive manufactured by the Swiss Locomotive Works, Winterthur, in 1922 now preserved pedestal. A special postal cover on the NMR was handed over by Shri S. Jayaraman, Chief Post Master General, Tamil Nadu Circle to Shri Nitish Kumar'.

In the Centenary year 1999-2000, an organization of steam enthusiasts in the title of 'Heritage Steam Chariot', Nilgiri Railway organized a couple of steam engine train rides, sight seeing and picnic tours from Udagamandalam to Runneymede and back. The tour tariff included food and beverages and was offered in two classes – in Maharaja Coach costing Rs.500/- per head and in other special coach costing Rs.200/- per head. This was an effort by individuals and very commendable.



Application For Inscription On World Heritage List :

Darjeeling Himalayan Railway was inscribed on the 'World Heritage List' in December'99. This mountain railway is the first such railway line in Asia, being conferred with this prestigious status. The World Heritage Committee inscribed the site under criteria (ii) and (iv). These criteria's read as below:-

Criterion (ii): The Darjeeling Himalayan Railway is an outstanding example of the influence of an innovative transportation system on the social and economic development of a multi-cultural region, which was to serve as a model for similar developments in many parts of the world.

Criterion (iv): The development of railways in the 19th century has a profound influence on social and economic developments in many parts of the world. The Darjeeling Himalayan Railway illustrates this process in an exceptional and seminal fashion.

Taking clue from the Darjeeling Himalayan Railway's inscription, Southern Railway through the Ministry of Railways have made an application for nomination of Nilgiri Railway for inclusion on the World Heritage List.

Southern Railway's justification for such inscription is based on the following:

i) The Nilgiri Mountain Railway is one of the oldest and having steepest rack and pinion technology successfully being operated even after more than 100 years.

ii) Most of the station buildings built during 1897 to 1899 are maintained in the same glorious look and serve the society at large.

iii) Nilgiri Railway is a cultural Diaspora, bringing the English rulers and the local tribes - Todas, Irulas, etc., inhabiting the mountain over the thousands of years. The introduction of the railway system brought out overall development of the region.

iv) The Nilgiri Mountain Railway preserve the heritage of the origin, people, culture, structure and the organisation, though it introduced the technological advancements of the 19th century.

v) Southern Railway in turn Indian Railways, the owners of the Nilgiri Railway are willing to maintain the Nilgiri Railway in its original style.

The Indian Railway's application is under active consideration and God willing, Nilgiri Mountain Railway's name may be inscribed with the 'World Heritage Status' in coming months.

15. Metre Gauge Steam Locomotives

Metre gauge as a second standard gauge for British India was well established in 1872. All but one of the early metre gauge lines were built and operated by the State. This exception was the South Indian Railway. Amongst the metre gauge State Railways, Rajputana Malwa Railway (RMR) was the pioneer, it dominated the Metre Gauge scenario.

By the end of 1879, nearly 400 locomotives had been put into service on Metre Gauge System, RMR owned 136, and other State Railway owned 149 while SIR owned 106. The fleet of SIR consisted of 24 Nos. of 0-4-2 design, 78 Nos. of 0-6-0 design and 4 Nos. of 0-6-0T design.

The expansion of Metre Gauge was very rapid from 1879 to 1899, the mileage went up from 1700 to 10,000, while the metre gauge locomotive fleet increased from 391 to 1472. The details of locomotive fleet (in 1900) for the three metre gauge lines relevant to this book are detailed below:-

Railway	0-4-2	4-4-0	0-6-0	2-6-0	Tank	Total
SIR	44	25	131	-	8	208
SMR	-	26	167	16	9	218
WIPR	-	-	-	-	12	12

The next twenty years saw evolution of British Engineering and Standards Association (BESA) designs. The first super heated metre gauge engine was SIR M-27, a BESA 4-6-0 type, built in 1912 and put into service in 1913. The locomotive holding in 1920 of MSM, SIR, and MSR are tabulated below, WIPR holding shown as a part of MSM :

Railway	0-4-2	4-4-0	0-6-0	2-6-0	4-6-0	4-8-0	0-6-6-0	Tanks	Total
MSM	-	14	157	10	73	27	3	19	303
MSR	-	2	7	14	-	-	-	-	23
SIR	41	39	60	10	99	-	-	66	315

The F-class 0-6-0 type dominated the scene right from the beginning, but the BESA design, 4-6-0 ran the prestigious trains by 1920. MSM had the distinction of employing three Mallet-articulated locomotives of 0-6-6-0 types as well as putting a few 4-8-0 types on their lines.

After the First World War, new metre gauge designs were developed from the broad gauge types. The original scheme envisaged classes YA (9 ton axle load, 4-6-2), YB (10 ton, 4-6-2), YC (12 ton, 4-6-2), YD (10 ton, 2-8-2) and YE (12 ton, 2-8-2). The YB Pacific was a popular and attractive design and similarly, YD freight 2-8-2 proved very useful. The locomotive holding in 1940 for the Railways covered in this book are tabulated :

Railway	4-4-0	0-6-0	0-6-2	4-6-0	4-6-2	4-8-0	2-8-2	Misc.	Tanks	Total
MSM	-	78	2	83	15	78	39	20	5	320
MSR	-	4	2	41	10	6	11	4	8	86
SIR	17	43	12	186	19	10	20	8	85	400

By then SIR had four metre gauge electrical locomotives plying between Madras Beach and Tambaram. MSM's fleet included 6 Mallets 0-6-6-0 type.

The Y classes were designed for India and were commonly known as Indian Railway Standard (IRS) Locomotives. The IRS locomotives built for MSM. SIR and MSR are given below:

Type	MSM	SIR	MSR
YB (4-6-2)	10	19	6
YC (4-6-2)	13	-	-
YD (2-8-2)	44	20	10
YF (0-6-2)	4	12	-

The first standard post war designs for the metre gauge, YP & YG, came out in 1948 and were scaled down versions of the WP & WG, although the Metre Gauge Pacific was not streamlined. During the Second World War a



large number of class WD (originally MAWD) 2-8-2 type were imported mainly from USA. Only a small portion was received for the southern part of the country.

The Southern Railway allocation of the Metre Gauge steam locomotives in September 1975 is tabulated below:

Shed	YP	YG	YL	WD	YD	X	Total
Madras Egmore	-	-	-	10	-	-	10
Chengalpattu	7	8	-	2	-	-	17
Guntakal	19	19	-	-	-	-	38
Pakala	9	7	-	-	-	-	16
Coonoor	-	-	-	-	-	12	12
Bangalore	21	6	-	4	-	-	31
Yeshvantpur	-	14	-	-	5	-	19
Arsikere	9	14	2	-	5	-	30
Mysore	10	10	10	-	1	-	31

Shed	YP	YG	YL	WD	YD	B	HPS	ST	X	Total
Shimoga Town	6	-	-	-	6	-	4	-	-	16
Villupuram	42	22	-	10	-	1	-	1	-	76
Mayiladuturai	-	-	4	-	-	-	-	17	-	21
Tiruchchirappalli	18	2	-	8	-	3	-	-	-	31
Madurai	48	20	11	-	-	-	-	-	-	79
Palani	11	4	4	-	-	-	-	-	-	19
Tirunelveli	-	11	15	-	-	-	-	-	-	26
Quilon	-	41	-	-	-	-	-	-	-	41
Golden Rock Shops	-	-	-	-	-	3	-	-	-	3
Total	200	178	46	34	17	7	4	18	12	516

Alas! In 2003 the steam holding has dwindled to a few X-class locomotives for the Nilgiri Railway, save a few preserved for the posterity.



A Broad Gauge 2-6-4 T locomotive of Madras Railway, built by M/s Kitson & Co. Ltd., Leeds in 1906

16. Broad Gauge Steam Locomotives

Hugh C. Hughes had fascination with steam locomotives on the Indian subcontinent. The Broad Gauge steam locomotives have been covered extensively in his books - 'Indian Locomotives: Part 1 - Broad Gauge 1851-1940'; 'Indian Locomotives: Part 4 - 1941-1990' and 'Steam Locomotives in India: Part 3 Broad Gauge'. Readers interested in knowing details of locomotives may refer these books.

Madras Railway Company was the forerunner in the southern peninsula. Most of the locomotives procured in 1850s were small tank locomotives and the company was quite satisfied with the speed of 20 miles an hour for its passenger trains and of 12 for its goods trains. The next purchases were twelve 0-6-0 locomotives and a few 0-4-2 tender locomotives from M/s. Beyer Peacock, U.K. Simultaneously the Perambur Workshop built 9 locos from duplicate Beyer Peacock parts to replace the old 9 locos. These were 0-6-0 designs, out of these three locos were rebuilt to 0-6-0 ST in 1906. None of these locomotives survived.

Madras Railway Company was pioneer in training Indians (or natives as they were called then) in the very beginning. 'The Statesman' of April 11, 1883 reported thus: -

NATIVES AS ENGINE-DRIVERS :- We learn that a school has been opened at the loco shed at the Royapuram terminus, for instructing native firemen and other natives in reading and writing in order that they may be qualified for employment as engine drivers. Without sufficient knowledge to enable them to read signals and instructions, it would be manifestly unsafe to entrust the driving of engines to natives, but is such knowledge sufficient and could the public feel as safe with a native, for an engine driver, as with a European? The change is of course being introduced on the score of economy, but if, as we are told, an engine only lasts about

half the time with a native-driver as with a European, and is not more than half as useful, where is the economy? And is it not worth something to continue to preserve the confidence of the public? Out of two or three-dozen natives recently engaged on the G.I.P. Railway, we believe more than half have resigned; but the Government and the Railway Companies are still all in favour of employing natives in preference to Europeans. Any native offering himself for employment as a fireman is, we are informed, readily and immediately taken on by the Railway authorities at Madras, but the case, it is said, is quite different should a European or an East Indian offer his services in the same capacity. - Madras Mail".

Great Southern of India Railway (GSIR) took the lead from the port of Nagapattinam and built its broad gauge line to Tiruchchirappalli in 1859. GSIR procured 21 locomotives mostly of 2-4-0 or 0-6-0 design from 1860 to 1870. South Indian Railway (SIR) took over the GSIR and Carnatic Railway along with the rolling stock in 1874. SIR took up the gauge conversion work and by 1879; they became pure metre gauge railway.

From 1st January 1908 as a result of reorganization of SIR, Madras Railway and Southern Mahratta Railway, two entities viz., new South Indian Railway and MSM came up.

The new SIR worked Jolarpettai-Mangalore section on broad gauge. They procured a large number of BG locos, 0-6-0 and 4-4-0 designs were their favorites. Superheating was introduced in 1913. BESA superheated SP class (4-6-0) came in 1921, while IRS class XB and XD were added in 1945. The colour scheme was generally a reddish brown for passenger locomotives and black for goods locomotives. A few express engines carried names e.g. SP6-PEGASUS, SP8 - INDUS, SP10 - AURORA, SP11 CLEOPATRA, XB 5 - MONARCH, XB 5, MAMMOTH.



The Golden Rock Workshop near Tiruchchirappalli maintained all SIR locomotives.

MSM was formed on 1st January 1908 and included the southern part of the East Coast Railway and parts of Southern Mahratta, Madras and SIR railways. MSM had a Central Workshop at Perambur for repairs of their rolling stock. In 1932, the locomotive workshop was separated out, a little farther towards West from the original site. In 1908, L.E.H. Brock, Locomotive Superintendent of the new MSM introduced the black livery with prominent zinc bands. One of the MSM broad gauge locomotives have survived all these years - V700 NARMADA and is preserved at the Loco Works, Perambur.

In June 1970, the holding of standard IRS locomotives on Southern Railway included - 63 WP, 142 WG, 31 WL and 9 WT. Out of these WL 15005 has been preserved.

A few of the broad gauge steam locomotives of Southern Railway origin have been preserved and covered in the chapter of 'Preserving Southern Railway Heritage'.

The Locomotive Works of Perambur near Chennai had the distinction of rejuvenating the 'Fairy Queen' locomotive (originally EIR 22, built 1855 of National Rail Museum recently). This locomotive regularly works tourist specials near Delhi.

The major steam loco sheds of Southern Railway and their holding in 1977 is tabulated below:

Basin Bridge (Madras)	41	Tondiarpet	14
Podanur	5	Arakkonam	46
Shoranur	88	Jolarpettai	18
Tiruchchirappalli	5	Bangalore	17
Quilon	22	Renigunta	2
Erode	87		

Southern Railway had the tradition of having beautiful round houses.

Alas no more working steam engines and no more round houses!

The 1939-45 war saw an enormous increase in traffic on Indian Railways and to cater for the desperate need for additional motive power, over 900 B.G. freight engines mostly of 2-8-2 designs, classed AWD if built in the United States and CWD if built in Canada were procured.

After the war a new 4-6-2 passenger locomotive was designed, class WP, incorporating the results of several years of research on boiler efficiency, valve gear and the lateral reactions of locomotives at speed on different kinds of track. Bar frames were introduced largely as the result of experience with the wartime engines from America.

To commemorate 150 years of Indian Railways, Southern Railway ran two heritage steam trains, one from Madras (Chennai) and another from Bangalore, hauled by 7161 WP in August 2002. The maximum axle load was restricted to 18½ tons.

A lighter 4-6-2 version, class WL with 17-ton axle load was introduced for a few routes. Southern Railway refurbished 15005 WL at its Golden Rock Workshop. This locomotive too ran a few heritage specials in the state of Kerala and Tamilnadu.

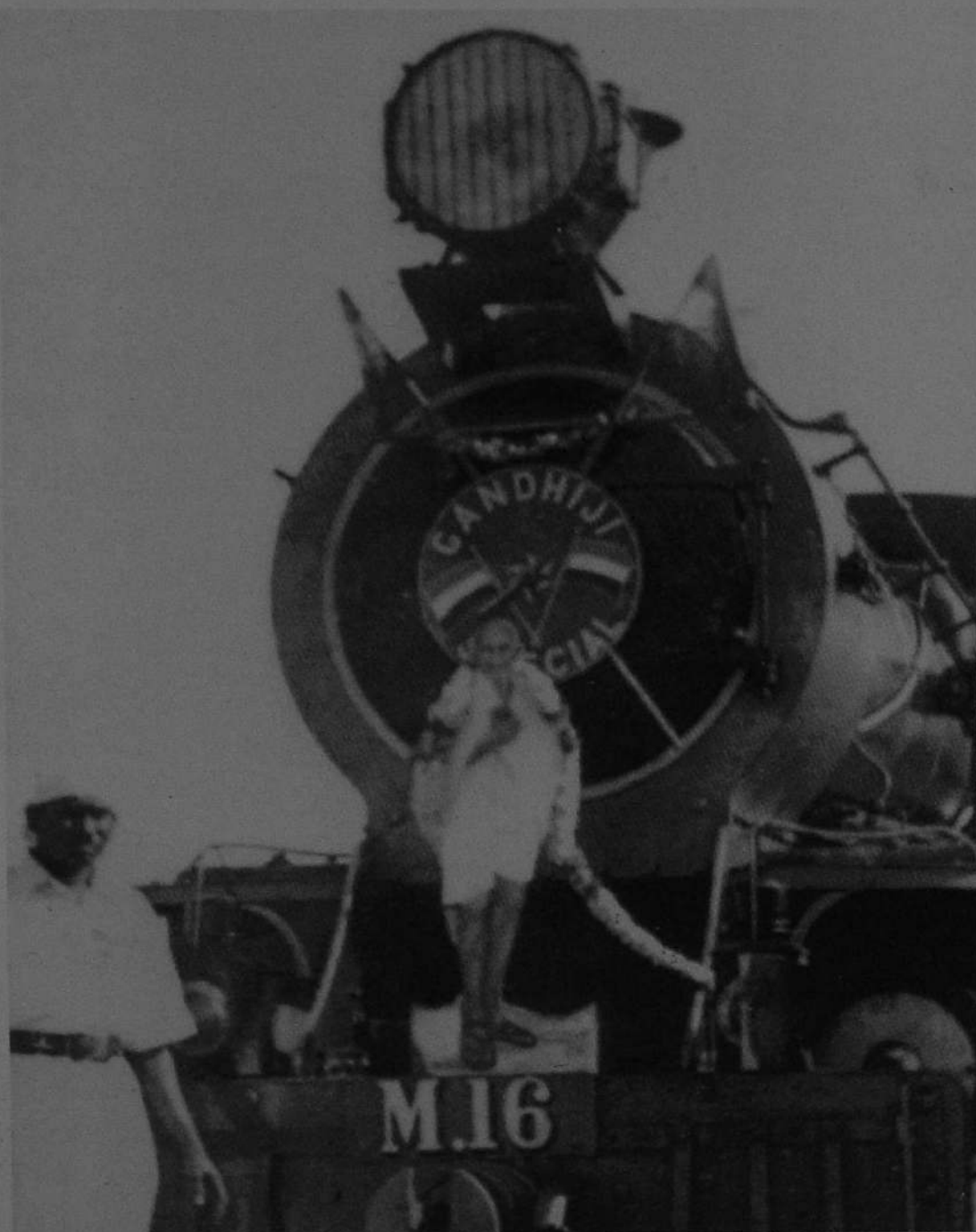
By far the most important post-war design was the class WG - 2-8-2 freight locomotives using the same boiler, motion and other parts as already standardized for the WP engines but with smaller coupled wheels and somewhat larger cylinders. The first 100 WGs were built in Britain in 1950 but many thousands came from our own locomotive factory at Chittaranjan. In service, Southern Railway had developed its own colour scheme, a distinct chocolate brown and black. On the heritage runs, the locomotives were repainted in its original livery and were applauded by all.



A WG locomotive (2-8-2) in steam in early 1970s.



South Indian Railway led in procuring large number of American built locomotives during the Second World War. AWC-22656 of Southern Railway (Originally 6487 of South Indian Railway) was one amongst sixty locomotives, purchased in 1944 from M/s. Baldwin Locomotive Works, Philadelphia, USA.



Mahatma Gandhi Special

A special train carrying the ashes of the Father of the Nation.

This train was hauled by a metre gauge steam locomotive, M-16 of SIR, a 4-6-0 design built by M/s Vulcan Foundry Ltd., Newton-le-Willows. This locomotive was renumbered as M-31277 of Southern Railway in 1957.



West of India Portuguese Railway (WIPR) No. IM-315, an 0-6-6-0 articulated locomotive built by M/s North British Locomotive Co. Ltd., Glasgow in 1911. Three such locomotives were purchased in 1911 followed by three more in 1921 by WIPR. These brought out the success of heavy articulated steam locomotives for mineral traffic, a lesson learnt by Bengal Nagpur Railway, by introduction of Garrat Locomotive.

17. Diesel Traction

The first internal combustion locomotive was equipped with a small petrol engine built by Daimler in 1891 at Stuttgart. In 1894, a standard gauge shunting locomotive equipped with a 30 h.p. Priestman two-cylinder vertical oil engine was built in Britain. In 1896, Richard Hornsby and Sons built a diminutive locomotive for an 18-inch gauge railway in U.K. embodying a number of features found later in diesel locomotives.

The first successful diesel engine was built at Augsburg Works by M.A.N. in 1897.

In 1913, an 8-wheeled non-bogie rail car equipped with a diesel engine developing 75 b.h.p. at 550 r.p.m. commenced regular working on a private railway in Sweden.

The first diesel locomotive was completed in 1912 for the Prussian State Railways, and was provided with four-cylinder V-type two-stroke engine, which drove the wheels direct through cranks and connecting rods. The diesel engine and auxiliary machinery were built by M/s Gebr. Sulzer AG of Winterthur, Switzerland. The chassis and super structure were supplied by M/s Borsig A.G. of Berlin. The locomotive was of the 2-B-2 Type, and weighed 95 tons, the engine being arranged transversely between the coupled wheels, with the disc cranks fixed on both sides of the crankshaft. For starting and operating at low speeds, compressed air was used, supplied from an air compressor driven by auxiliary diesel engine, which developed 250 b.h.p. at 350 r.p.m.

The main engine was rated to develop 1,000 b.h.p. at maximum speed of 304 r.p.m., corresponding to a rail speed of 62 m.p.h., and during tests carried out at the maker's works developed no less than 1,600 b.h.p. at this speed. The road tests carried out with the completed locomotives were, however, extremely disappointing. After fracturing a crankshaft,

which had to be replaced, the locomotive achieved its optimum performance, attaining a speed of 50 m.p.h. on level track with a load of 198 tons.

In 1924, the first high-powered diesel-electric locomotive was completed for service in the Soviet Union. This locomotive was built in Germany by the Esslingen Maschinenfabrik, and was designed so that it would be capable of undertaking the same duties as the standard Russian ten-coupled steam locomotive being built at that period. The well-known Russian locomotive engineer, professor Lomonosoff, who had that time supervised the purchase of Railway material for the Soviet Union, was mainly responsible for its construction.

This 2-Eo-2 type locomotive weighed 122½ tons., and was equipped with a M.A.N. submarine-type engine, with blast air injection, operating on the four-stroke cycle. It drove the main generator, which was independently mounted, through a large flexible coupling and developed 1,200 b.h.p. at 450 r.p.m. The five-axle hung traction motors were self-ventilated. The starting tractive effort was 44,000 lb., and the maximum speed 33 m.p.h., cooling equipment was mounted at one end of the locomotive with fans driven from the main engine, and included sections for cooling both water and engine lubricating oil. In accordance with the usual practice for engines of the type, compressed air supplied from storage bottles was used for starting.

After 1918, interest in the hydraulic speed-transformer received momentum when its possibilities as a hydraulic transmission for diesel locomotives were recognized. In 1926, Föttinger designed a transmission incorporating two torque converters and a fluid coupling operating in sequence and suitable for a 1,600 h.p. diesel



locomotive. Although the locomotive was never actually built, the principle was later taken up and developed by Voith. In Sweden, Lysholm perfected the multi-stage hydraulic torque converter, and, in England, Coats, improved the efficiency of the single-stage torque converter by adopting pivoted guide.

The application of the fluid coupling to automotive vehicles to give a smooth take up of the drive and eliminate clutch wear was first made by Harold Sinclair, who soon realized that it would be a valuable adjunct to Mechanical transmission systems for diesel locomotives and railcars. The first locomotive to be equipped with a fluid coupling was constructed by Hudswell Clarke in 1931. It was provided with a four-speed mechanical transmission, and the engine developed 300 b.h.p.

Prior to the formation of British Railways, the major development work in connection with diesel traction in Britain was carried out by the London, Midland and Scottish Railway Company. Shunting locomotives equipped with different types of mechanical, electric or hydraulic transmission were built, and from the experience gained a standard type of diesel-electric shunter was evolved. In 1938, an experimental three coach articulated diesel train was built at Derby, equipped with six Leyland engines driving separate axles through Lysholm-Smith hydraulic torque converters. The total power output was 750 b.h.p and empty weight was 75 tons.

The culminating point in the development of diesel-electric traction on the L.M.S Railway was reached in 1947, prior to the formation of British Railway, with the completion of the first main line diesel-electric locomotive to enter regular service. This locomotive was produced in association with The English Electric Company who supplied the electrical equipment and

control gear together with the power plant. The engine was rated to develop 1,600 b.h.p. at 750 r.p.m.

In India, Kalka-Simla Railway was the first to introduce internal combustion engines for traction. In 1911, a 17 h.p. petrol four-wheeled railcar was introduced. This rail car built by M/s Lloyd and Plaister Ltd., London served as mail-van. Two years later, two more rail cars with 30 h.p. petrol engine were introduced on Kalka-Simla Railway.

In 1915, South Indian Railway procured 3 rail cars for their MG sections. These were built by M/s Motor Rail Ltd., Bedford, U.K. They were given the class name SIM and were numbered from 1 to 3. No.3 was sent to Aden in 1916 and the other two after few years of service were grounded. In 1962, these were brought back and converted into MG Tower Wagon. In 1925, one more rail car was purchased from the same company.

In 1926, one MG rail car was procured from M/s Wingrove & Rogers Ltd., Liverpool.

It will thus be observed that SIR was leading in use of Internal Combustion Engines for their MG sections.

Diesel Traction in India commenced with the two 350 b.h.p. Bo-Bo locomotives on the broad gauge North Western Railway but did not meet with great success. Gaekwar's Baroda State Railway was the first to introduce 95 b.h.p. Armstrong Whitworth built diesel railcars in early 1933 successfully. Kalka-Simla Railway also acquired a similar railcar in August 1933 for their passenger services.

Two 1,300 b.h.p Armstrong Whitworth diesel locomotives were tried, without success on the broad gauge Karachi-Lahore mail trains.



Madras and Southern Mahratta Railway obtained good results with six 180 b.h.p. Armstrong-Saurer oil-electrical railcars around that time.

The first main line diesel locomotives were introduced in 1954 for the Western Railway's Palanpur-Kandla metre gauge line. These twenty DY Class (later YDM-1) locomotives were built by M/s North British Locomotive Company and later in 1974-76, were rebuilt by Chittaranjan Locomotives Works with Maybac engine.

In 1957, Eastern Railway and in 1958, Eastern and South Eastern Railway procured 100 WDM1 locomotives from M/s American Locomotive Company (ALCO) of USA followed by large numbers of WDM2 from ALCO. In 1964, Diesel Locomotive Works, Varanasi commenced manufacture of WDM-2 locomotive under license from ALCO, USA.

Southern Railway experimented with WDM3 mixed traffic locos imported from Germany in 1969. These locos were powered by 20 cylinders, 4 stroke MTU engines. These were 4 axle locos - 5 such locos were fitted with SUR1 type hydraulic transmission and other 3 locomotives were fitted with MEKYDRO type hydraulic transmission. To quote from Shri V. Anand, General Manager, Southern Railway and a great fan of WDM3 locos,

" These were mixed traffic locomotives having a gross horse power of 2600 but due to higher transmission loss, the horse power at rail was somewhat less than the ALCO built WDM2 diesel-electric locomotives. All these locomotives were based at Gooty. They were examples of German technology at its precise best.

These locomotives had the unique state of the art suspension consisting of helical springs in the primary as well as secondary suspension. The secondary suspension was a flexi-coil

suspension, the springs not only flexed in the vertical mode but in the lateral mode and if I recollect in the longitudinal mode also.

There was no swing bolster and the springs themselves supported swing links. The engines were beautifully matched with the Brown Boveri turbo-supercharges. Were the 11 Dn/12 Up express reared past, the unique whine of the turbo supercharges announced the movement of these superb locomotives.

Oscillation trials conducted upto 136 kmph in the main line track of Guntakal Division (consisting of bull headed rails on cast iron pot sleepers connected by steel tie-bars and held with wooden wedges!) and the riding was acceptable up to the highest test speeds.

After a few years of service, when the engines, were opened for inspection, no measurable wear could be detected in the liners. Thanks to the advanced air filtration system used in these locomotives.

Unfortunately this locomotive was asked to perform duties far beyond its capacity. A " race horse " was asked to perform like a " donkey ". When the transmission elements started failing, the awful track which was really responsible was not improved upon and the blame fell most unfairly on the hydraulic transmission. With the advent of large numbers of Diesel Electric Locomotive, the WDM3 were doomed but not before Audit Department also had a dig at it.

In my first posting on Southern Railway as an Assistant Works Manager/ Loco Works, Perambur, I had personally supervised the manufacture of two models of these locomotives based on the photographs and measurements taken in the Harbour where locomotives were unloaded for onward despatch to Gooty Shed. One Model was presented to the then Genaral Manager and



the other model now adorns the General Manager's Office in Southern Railway.

Though the WDM3 Locomotives were unceremoniously condemned, we learnt a number of lessons.

1. No four axle locomotives will succeed in Indian Railway conditions unless it is for light passenger service. Other four axle locos such as WAM1, WAM2, WAM3, WAG4, WAG2 and WDM6 ultimately fell by the wayside.

2. No self propelled rolling stock whether it is a locomotive or DMU which has a direct transmission element from the prime mover to the track can survive Indian Railway's permanent way.

3. The locomotives designed very precisely will never succeed on Indian Railways. They must be over designed with sufficient reserve power in the prime mover though the WDM3 locomotive is dead and gone, it lives on, in the WAP series of electric locomotives. The elements of bogie design were adopted for the WAP1, WAP2 and WAP4 locomotives with conspicuous success."

The original WDM2 design was upgraded for giving higher horsepower in 1990s. At the turn of the century, Indian Railways procured a few state of the art diesel locomotives from General Motors of USA and also commenced manufacture of these engines at their Diesel Locomotive Works, Varanasi. The first lot of these locomotives - WDP4, passenger version and WDG4 freight version are housed in a state-of-the-art diesel shed at Hubli. These locos do ply on the lines of Southern Railway.

Diesel Locomotives run on all the zones as well as on all the four gauges of Indian Railways and are the workhorses of India's lifeline. Diesel sheds at Erode, Golden Rock, Ernakulam and Tondiarpet serve Southern Railway. The Golden Rock shed also houses the metre gauge locomotives; while the diesel shed at Tondiarpet take care of shunting locomotives. Erode locomotives serve a large number of trains going destinations of North Western Railway almost 2000 km away.

Southern Railway had 5 major Diesel Sheds at Erode, Golden Rock, Ernakulam, Tondiarpet and Krishnarajapuram. The Shed holding as on 31.03.2003 is given below: -

SHEDWISE / TYPEWISE BG DIESEL LOCO HOLDING AS ON 31.03.2003

	WDM2	WDG3A	WDP3A	WDM3A	WDM7	WDS4	WDS6	Total
Erode	73	31	0	27	0	0	0	131
Golden Rock	35	0	15	1	7	0	3	61
Ernakulam	34	0	0	0	8	0	10	52
Tondiarpet	0	0	0	0	0	61	4	65
Krishnarajapuram	53	10	0	13	0	0	4	80
Total	195	41	15	41	15	61	21	389

The MG diesel locos are housed at Golden Rock Shed of Tiruchchirappalli division. The shed holding on 31.03.2003 was 98, comprising of 83 YDM4/4A and 15 YDM2 locos.

18. DC Electrical Traction

People of Madras City were familiar with the Electric Traction. Madras was the first city in East where Electric Tramways were introduced. The Madras Electric Tramway Company Limited was incorporated in 1892 under an order of the Madras Government dated April 6, 1892. The construction of the first track commenced in 1894 and the first tramway section opened for use in May 1895. Its activities were expanded in 1904 covering a track of over 16 miles. The company used to carry 125, 200 passengers; but had to close its operations in April 1953 due to mounting financial losses.

In 1927, M/s. Merz and McLellan, consulting engineers for Indian Railway Board, concluded their investigations on the Madras hydroelectric schemes with special reference to Railway Electrification in South India. 'The consulting engineers agreed that it is essential and desirable to speed up the hydroelectric programme. At the same time, the education of public opinion on the utility and advantage of electricity should be undertaken. M/s. Merz and McLellan do not advise the extension of electrification to Madras as the high cost of transmission system would necessitate the imposition of prohibitive rates.'

By 1929, South Indian Railway (SIR) firmly resolved for the electrification of the Madras suburban services. They awarded a contract in 1929, to M/s. English Electric Company for 17 three coach articulated units, each consisting of one motor coach and two trailer coaches; and 4 Bo-Bo locomotives with 2 battery tenders. On 2nd April 1931, the Governor of Madras opened the metre gauge suburban section from Madras to Tambaram for electrical working, public services commenced in May 1931.

An interesting feature of the 1500V. DC Madras Suburban Electrification, Metre Gauge

Section, was the construction of new double track and stations, instead of the conversion of existing lines on the 18 mile run from Madras to Tambaram. The existing lines were already congested and it was impossible to run the increasing traffic over them. The line runs more or less parallel to the seacoast for half the distance. The new line opened new stations and paved the way for new residential development. The suburban traffic multiplied 3 times in a period of 10 years, from less than 3 million in 1927-28 to over 9 million in 1937-38. To meet additional traffic in 1933, seven three coach units were added to the previous lot from the same supplier.

Basin Bridge Steam Power Station of the Madras Electric Supply Corporation supplied electricity at 5000V, 3 phase, 50 c/s A.C. to the Egmore controlling sub-station of S.I.R. It was stepped down to 1168V, 6 phase current by oil-cooled transformers. This was then changed into 1500 V, D.C. by two steel cylinder water jacketed mercury-arc rectifiers, for electrical multiple units and locomotives. South Indian Railway was the first to use large rectifiers for conversion of electricity in India, BB&CI later followed SIR's example for their Borivli-Virar electrification scheme. Each rectifier was designed for a maximum temperature of 60°C and rated at 500 amperes, continuous and could give 1225 Amperes for 3 minutes and 740 Amperes continuously. Other transformers 5000/400V lowered the incoming high voltage to A.C. 400/230V, for lighting, etc. A motor generator set was also provided at Egmore sub-station for charging the batteries for the Battery Tenders when they came to Egmore.

Another substation was provided at Minambakkam, 7 miles from Egmore. This substation received power at 33 KV, 50 c/s., A.C. 3 phase from Egmore sub-station through a high-



tension transmission line. It is interesting to note that 33 KV Power at Egmore was transformed from the 5 KV input supplied by Madras Electric Supply Corporation. From Minambakkam, a 5000V, 3 phase A.C. line ran to Tambaram where the electric section terminated. The car shed was situated here along with arrangements for reducing the pressure to 400/230 volts A.C. and for charging the batteries. At Minambakkam also transformer and rectifiers were provided to convert A.C. input into 1500V, D.C. for traction. The rectifiers supplied by M/s. Brown Boveri were metal tank type; input 1168 volts, 50 c/s, 6 phase current fed by a 1100 KVA star double fork transformer and with an output of direct current 1500V, D.C, 750 KW from each rectifier.

From Egmore to Beach, a 5000V, 3 phase, 50 c/s cable provided the supply of light and power to stations and for automatic signalling. Between Egmore and Minambakkam a 5000 volt line was also carried on the overhead contact line structure in order to supply electricity for lighting, etc., to the stations. At Beach station provision of intake of 5000-volt power from Madras Electric Supply Corporation made it possible to have duplicate feeders to minimize delays due to faults.

Provision was made for permitting electric trams to cross the railway lines as well as for removing of certain overhead lines at road crossing to allow high Ratha or Tazias to pass at certain festivals of Hindus or Muslims.

Rolling Stock:

The initial suburban service, which started in 1930-31, was provided by 17 three-coach units, which, in several respects, departed from previous practice. Each unit consisted of three articulated coaches with a driving cab at the end. The four axles of the two articulated bogies were motored and the control gear housed at one

end of the centre coach. These equipments embodied features, which, in principle, were adopted subsequently on many other systems. The motor coach units were arranged for multiple units working, so that trains could be formed with three, six or nine coaches, according to traffic conditions. Of the 17 units supplied by M/s. English Electric Company in 1930-31, 10 were composite 1st, 2nd and 3rd class, arranged to suit local customs and conditions, and the remaining 7 were 3rd class units. The seating capacity of a third class unit was 194 and the unit was 151 feet long, weighing 73 tons. The double sliding doors in the passengers' compartment were fitted with hand-operated gear, so arranged that when one door is moved the other also moved in the opposite direction. The coach body was painted with superior aluminium, the interior being light apple green.

The power equipment on a three coach unit consisted of four 120 h.p. motors connected in pairs, in series so as to work on 750 volts D.C. The motors were self-ventilated, but drew their air supply from inside the coach near the roof through ducts and sliding flexible joints. This special provision was made to counter the extremely dusty conditions. The control gear was of the 'English Electric' camshaft type and was mounted on a framework fitted with rollers for easy removal. The control equipment was housed in a high-tension compartment at one end of the centre coach, which also contained a 4 KW motor generator set for supplying the control and lighting circuits and a motor driven rotor exhaustor. The control circuits were supplied from the motor generator set at 60 volts and an emergency battery, which was charged automatically, floated across the terminals of the set. The high tension compartment contained all 1500 volts apparatus, including main isolating switch solenoid operated line breakers, motor driven camshaft control equipment,



reverser, motor cut out switches, main resistances, motor generator set, exhaustor set, accelerating relays, etc. For safety, the door of this compartment was interlocked with an earth switch.

The driving compartment of the trailer coaches was fitted with master controllers, driver's brake valve controller, control switch set and trip, pantograph control switch and switches for remote control of lights. The pantographs on units were vacuum operated and were provided with a bow carrying hard copper contact strips; and a special graphite lubricant was used to reduce the wear of the trolley wires. All the units were fitted with vacuum brakes.

The suburban services started originally with a total of 29 trains per day in each direction and in a decade, the number of trains had trebled. The time taken for each trip was 42 minutes, stopping at all the 14 stations. In rush hours train headway of 6 minutes was maintained. All the cleansing, washing and repairs were undertaken in the car shed at Tambaram. The car shed had three bays - one for inspection, another for heavy repairs and overhaul, and the third bay for painting. The heavy repair bay was equipped with hydraulic jacks simultaneously operated in sets of 4, 8 or 12 at a time, for one, two or three coaches as required. Turntables were provided under the bogies to enable them to be withdrawn to a separate platform, where from they were lowered to the floor by the overhead crane, after the coaches had been lifted.

In addition to the suburban lines, some of the shunting yards were also electrified and were operated by four 42 ton, double bogie, 640 h.p. locomotives.

The locomotives were numbered as YCG-21900 to 21903. The first of these four

locomotives YCG-21900 painted in bright aluminium has since been preserved at National Rail Museum, New Delhi. One more locomotive has been preserved at the car-shed, Tambaram and the other two have since been condemned.

The 1500V, D.C. Madras - Tambaram system has been converted into 25000V, A. C. system from 15th January 1967, and more details are in the next chapter.

These locomotives were capable of hauling 500-ton freight trains or a passenger train having 10 bogie coaches weighing about 250 tons at speeds from 25 to 40 miles per hour, the maximum safe working speed being 45 miles per hour. The engine is 36' 8½" long from buffer to buffer, 8'6" wide and 12'0" high. In raised condition, the pantographs are 19'0" above the rail level. The engine was 42 tons in weight and is Bo-Bo wheel arrangement; the wheels are 43 inches in diameter.

Four motors of 700V, 165-horse power, one hour continuous rating provided the drive to the four axles on two bogies. The two motors on each bogie were joined permanently in series with the input current from overhead traction wires. The two groups of motors on each bogie could be run in series, series parallel combinations. Additional field resistances enabled more economical working speeds. The motors provided a continuous tractive effort of 15,000 lb, at 15 m.p.h., 4,000 lb at 30 m.p.h. and maximum tractive effort of 23,000 lb for five minutes.

The locomotive was provided with compressed air brakes, arrangements for rotary vacuum exhaustor for train brakes are also provided. A motor generator set of 4 KW capacity provided power at 60 volts, which operated the various control equipment. Two compressed air activated pantographs were



provided on each locomotive. The pantographs were so inter-locked that they could only be raised when the high-tension compartments are closed.

One of the chief difficulties encountered in laying out this electrification was the fact that there were a number of small yards at some distance from the main line which could not conveniently be provided with overhead construction and at the same time it was extremely undesirable to have to provide a steam locomotive whenever movements had to be

carried out at these yards. For this purpose South Indian Railway acquired two Battery tenders equipped with heavy-duty batteries, capable of supplying power to the locomotives at 440 volts. These tenders supplied by English Electric Co. weighed 21 tons, had a capacity of 158 KW hours at the five hour rate of discharge of the battery. A complete charging switchboard and auxiliary air brake compressor, operating at the lower voltage were carried on the tender. Arrangement of charging these tenders was made at Egmore and Tambaram.



EG 1 (later YCG 21900), B+B design Metre Gauge Electric Locomotive of South Indian Railway along with battery tender ET 1. These were built by M/s R & W Hawthorn, Leslie & Co. Ltd., Newcastle-upon-Tyne and M/s The English Electric Company, Preston & Rugby respectively in 1930.

19. AC Electric Traction

Metre Gauge

SIR electrified its metre gauge section from Madras Beach to Villupuram in 1930s. In early 1960s, it was felt that it should be converted to 25 KV, single phase, 50 c/s. This was the first electrification scheme that had been completed by a zonal railway, with the technical guidance of the Railway Electrification Organization. It was also the first scheme where the Railway constructed its own grid sub-stations, where the 110 KV, 3 phase supply from the State Electricity Grid is converted to 25 KV single phase, the catenary voltage in the new system. This project also used for the first time in India, the indigenously manufactured transformers and remote control equipment.

The scheme was approved in 1961, and in 1962 the section Tambaram to Vandalur was electrified for operation on 25 KV, AC single phase, but was temporarily kept energized on 1500 volt DC to facilitate the extension of the suburban services up to Vandalur, where an automobile factory had been set up. The foundation for the electrification work between Tambaram and Villupuram was laid at Guduvancherry in May 1963, and the entire work was completed and energized as indicated below :

Third line Madras Egmore and Tambaram	15.01.1965
Tambaram (inclusive) — Chengalpattu	09.01.1965
Chengalpattu (inclusive) — Vikravandi	31.01.1965
Acharapakkam (inclusive) — Vikravandi	20.03.1965
Vikravandi-Villupuram	26.03.1965

The first electrically hauled through goods train was run from Villupuram to Tambaram on the night of March 26, 1965, signifying the completion of the electrification work on the section Tambaram-Villupuram.

All the goods services in the section Tambaram-Villupuram were taken over by AC traction; and from April 1965 the passenger

trains were progressively changed over to AC traction over the section Tambaram - Villupuram, as and when the AC locomotives were received from Japan and commissioned. The first express train hauled by AC electric locomotive on this section was inaugurated by Shri O.V. Alagesan on 14.08.1965 at a special function presided over by the Chief Minister of Madras. By April, 1966 all the passenger and goods trains in the section Tambaram - Villupuram were taken over to AC traction, excepting for the locals to Kanchipuram which meant a change of traction at Chengalpattu.

On the night of Pongal (Makara Sankranti) on 14th January 1967, the modern system of AC Electric traction on 25,000 volts, single phase, 50 cycles, for suburban services was ushered in Madras replacing the old system of electric traction on 1500 Volts DC which had helped in the growth and development of the suburbs of Madras City towards Tambaram. What is remarkable about this change over is that it has been accomplished overnight without curtailing even a single suburban train service, even though the change over involved tremendous amount of work. The regular suburban service was maintained on the night of 14th January 1967 and after the passage of the last train, the DC Section was switched-off finally at 00-21 hours on 15th January 1967, and then modifications of the overhead net work on the section between Madras Beach and Tambaram (111km. of track) was taken up to make it suitable for operation of 25,000 volts AC. The entire work was completed in 46 minutes and AC power was switched on at 01.07 hours. The trains on the new system were started at 4 A.M. on 15th January 1967, as usual. The changeover was smooth, efficient and without any accident or untoward incident.



Difficulties in changing traction system from 1500 Volts DC to 25000 Volts AC arose out of:

- a) the need to provide greater clearances of the live wires from adjoining structures and improving the insulation level at each support to suit the operation on 25000 volts AC;
- b) the necessity to maintain the commuter services on the suburban section uninterrupted and un-mitigated during the construction period which meant that the modifications to OHE etc., have to be carried out between midnight and 4 a.m. when the suburban services were normally suspended; and
- c) the necessity to ensure safety of the personnel working at night, during the most inconvenient hours, on the high voltage wires and also to ensure safety of the costly equipment.

Southern Railway successfully got over these difficulties.

Rolling Stock: AC Electric Locomotives:

20 AC electric locomotives (YAM1 series 21904 to 212923) were imported from Japan to cater for the needs of both goods and passenger services on the section. These locomotives are of Mitsubishi make. Each locomotive, weighing 52 tons, is of B-B design with 1200 KW or 1600 HP and is capable of hauling 1450 tonnes at 60 kmph on level track and at 35 kmph on 1 in 200 gradient, which is the ruling gradient on this section. It can haul 16 passenger coaches at a speed of 80 kmph on level track. The locomotive is of the mixed traffic type, suitable for both passenger and goods services, with single motor per bogie, using silicon rectifiers and can exert a tractive effort of 19.5 tonnes at start and 12.5 tonnes at 35 kmph. This is the most powerful metre gauge locomotive on the Indian Railways.

A.C. Electric multiple unit stock:

The EMU stock, manufactured by the Integral Coach Factory, Perambur with the electrical equipment initially imported from Japan, consists of a motor coach, two non-driving trailers and a driving trailer. Each motor coach is powered by four motors, each capable of exerting 172 HP at continuous rating or 195 HP at one hour rating, with 'F' class insulation for the armature and 'H' class insulation for the field. A bridge connected silicon rectifier is used in conjunction with an air-cooled smoothing reactor, with 'H' class insulation, to smoothen the ripple of the DC current.

19 AC electric multiple units, each consisting of four coaches, were obtained from Integral Coach Factory, Perambur.

Metre Gauge Tower Wagon:

The prototype MG Rail Tower Wagon did not exist. The BG Tower Wagon did not lend itself to be easily copied. The design had to be started from the beginning. The simple expedient of mounting a diesel engine on a coach body, presented innumerable problems, not all of them easy to overcome. No easy solution could be found for the drive from the diesel engine to the wheel. It was while these seemingly impossible conditions were being sorted out that the unused diesel rail cars stabled in the Golden Rock workshops were first heard of:-

There were two diesel rail cars of 13.6 tonnes with capacity for 70 passengers in use in the Tiruchchirappalli Division of Southern Railway since October 1915. These vehicles had open sides and lacked amenities to the normal scale. They had to be withdrawn and stabled in the shops in August 1962 as a result of persistent public complaints. When the problem of drive for Tower Wagon was being worked out, the



existence of these rail cars without any apparent future use came up and the idea of modifying them as Tower Wagons was born. It was a case of ingenuity and it paid.

Broad Gauge

After the success of 25 KV, 50 c/s on Eastern sector, electrification on the BG sections of Southern Railway was taken up. The first BG section was from Madras to Gummidipoondi energized on 13.04.1979. This was followed by the electrification of Madras Beach - Korrukupet - Madras Central on 09.08.1979. Electrification of Madras - Tiruvallur section was completed on 29.01.1979. With these sections electrified, it became possible to run Electric Multiple Units in the areas nearby Chennai.

The main line electrification began with the energization of Tiruvallur - Arakkonam section on 03.09.1982 and an extension to Katpadi on 11.08.1984. It took eight more years to electrify the complete Madras - Bangalore section in March 1992. Jolarpettai - Erode, Erode - Palghat, Shoranur - Trichur were electrified from 1994 to 2002. The electric traction between Trichur - Ernakulam was inaugurated on 23.07.2002. The inauguration of railway electrification work between Ernakulam - Trivandrum was done on 11.08.2001. With this, the Chennai division and the Palghat division are having extensive electrification while Trivandrum and Tiruchchirappalli divisions have small portions electrified. The electric locos are maintained at Electric Loco Shed at Arakkonam and Erode.

Electric Loco Shed, Arakkonam

Arakkonam shed commissioned in 1982, homes a total of 115 locomotives comprising of 63 WAM4 51 WAG5HA and one WAG5A. To improve the reliability of the WAM4 locomotives all 63 WAM4 locomotives have

been converted to 6-P arrangement. At the same time 27 number of locomotives have been provided with high speed gears which allows the locomotives to attain higher balancing speeds while working coaching trains, 34 numbers of locos have also been made fit to work air brake trains.

All the goods locomotives based at Arakkonam are fitted with rheostat braking equipment.

✓ Electric Loco Shed, Erode

Erode loco shed was commissioned in 1998 to home 50 electric locomotives. The work of expanding the capacity of the shed to 100 locomotives is underway. The shed holds the latest generation of high horse power indigenous WAP4 and WAG7 locomotives, which can deliver 5000 HP motive power. The present holding of the shed is 82 locos comprising of 47 WAP4 and 35 WAG7.

WAP4 locomotives of Erode locomotives shed work Kerala Express all the way from Ernakulam to New Delhi, which is the longest run by a single loco on the Indian Railways.

BG EMU services

BG Suburban services were commissioned during 1979.

BG AC EMUs are being maintained at EMU workshop, Avadi. The present holding is 122 motor coaches and 295 trailer coaches.

The newly inducted BG AC Main line EMUs (MEMU) are also maintained at EMU workshop, Avadi, running in Arakkonam-Katpadi-Jolarpettai sections. The present holding is 7 motor coaches and 21 Trailer coaches.

Avadi Car Shed under takes all schedules as well as Periodical Overhaul (POH) of these coaches.



BG EMU services were introduced between Chennai Beach and Park Town stations in the Mass Rapid Transit System (MRTS) from 16th September 1991, between Chennai Park Town and Chepauk on 16th November 1995 and between Chepauk and Thirumailai on 19th October 1997. The EMU rakes for MRTS service are now been provided with 'PARKING BRAKES' for holding the train in graded section in case of necessity. 3 Car EMU services were introduced in MRTS section. This has evoked good response. From 28th January 2002, services were increased to 118, each rake constituting only 3 cars.

Ongoing Electrification

There are two projects being actively pursued presently.

The first project is the electrification of Tambaram-Chengalpattu-Villupuram and Chengalpattu-Arakkonam sections spread over a length of 197 km. The estimated cost is Rs.38.44 Crores and the project is likely to be completed in 2003-04.

The second project is the electrification of Ernakulam-Trivandrum section, 320 km in length. The estimated cost is Rs.162.03 Crores. So far about 40% work is complete and the project may take another year for completion.

Mass Rapid Transit system (MRTS) has been covered in Chapter No. 21.



A 4-car Electric multiple unit suburban train heading for Madras Egmore.



Satya Sai Prasanthi Nilayam, a new station building to serve Dharmavaram



Indian Railway Catering and Tourism Corporation (IRCTC)'s first foray – a food mall at Chennai Central Station. This food mall, leased to a few of the most popular hotel chains, became an instant hit.



Chennai Egmore Station (built 1906 – 08) of the erstwhile South Indian Railway is an ornate structure in brick, rimmed with granite and sandstone. Towers are capped by domes in typical Mughal style while intricate stone carving on the arcades gives a majestic look



Southern Railway Headquarters, Chennai



Sri. Nitish Kumar, Hon'ble Union Minister for Railways, opened a rail museum near ICF, Perambur for preserving rich heritage of Southern Region.



Fowler Ploughing Engine, the prize exhibit of Rail Museum, Chennai sports a steam engine on fours for ploughing in the track formation.



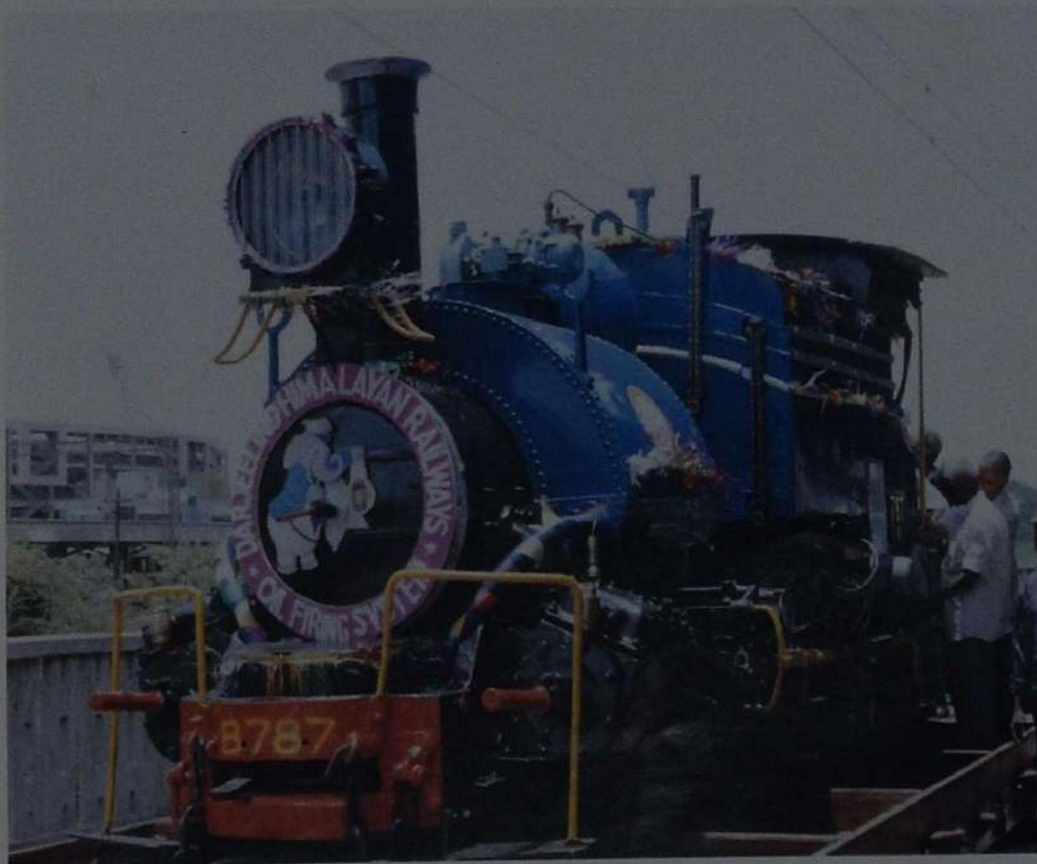
New Carriage Repair Shops at Perambur. Note the height of the overhead crane enabling it to lift one coach above the other thereby improving flexibility.



Fairy Queen (EIR 22, 1855 built) is the oldest working locomotive anywhere in the world as certified by Guinness World Records. Though an East Indian Railway Locomotive, it is regularly maintained by Loco Works, Perambur. Note the locomotive in its original livery outside Perambur.



"Southern Beauty", a driving trailer unit of Diesel Electric Multiple Unit (DEMU), given aerodynamic look and added with many crew friendly features by the Loco Works, Perambur won the All India Competition in Delhi in 2003



B 787 of Darjeeling Himalayan Railway rebuilt with oil firing features and fitted with air compressors for air brakes on new coaching stock of DHR. Central Workshops, Golden Rock did all R & D and re-building work.



A Nilgiri train being hauled by X-37395 before its retrofit with oil firing system.

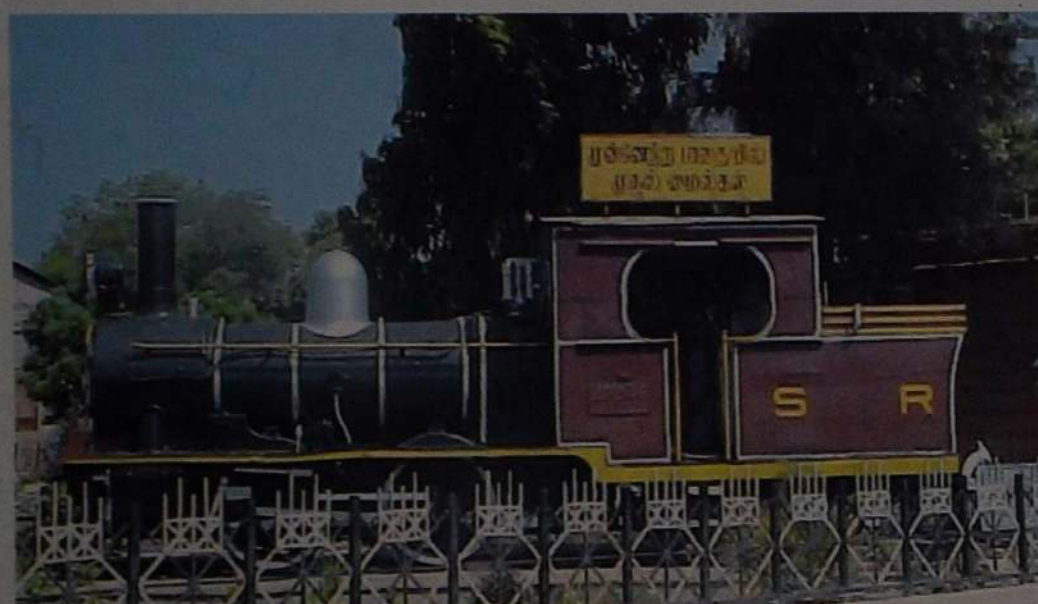


X-37395 after its retrofitment with oil firing system in 2003. It has been named NILGIRI QUEEN and works from Mettupalayam to Coonoor.



The Temple Bell at Rockfort Temple, Tiruchchirappalli was presented by Mr. G. Crighton, Loco & Carriage Superintendent, South Indian Railway. This bell was cast at Railway Workshop, Nagapatanam in 1918.

The Temple Bell at Chidambaram, Tamil Nadu cast by the South Indian Railway Workshop, Nagapatanam in 1889, still in use.



A 37346, a metre gauge locomotive built by M/s. Yorkshire Engineering Co. Ltd., Sheffield, UK, in 1920 is now preserved in Central Workshops, Golden Rock, Tiruchchirappalli.

A hand crane built by M/s. Cowans' Sheldon & Co. Ltd. in 1887 is preserved in Central Workshops, Golden Rock, Tiruchchirappalli.



20. Southern Railway (1951-1966)

Grouping of Indian Railways

Extracts from the Railway Gazette of September 17, 1923 are reproduced below:

"The question of Indian Railway grouping is at present receiving considerable attention in India. Over a year ago certain tentative suggestions on the subject were made by Sir Ernest Bell of the Railway Board for the consideration of the Government, and more recently public attention was drawn to the question in the report of the Retrenchment Committee of which Lord Inchcape was the Chairman. In the report of this Committee the following recommendation is made: -

'We are convinced that, in a country like India with her vast territory and differing people and circumstances, it is an impossibility to control the details of all the railways from Delhi and Simla as at present. Decentralization is in our opinion essential if the railways are to be developed on economic lines. It is generally agreed that large economies could be affected by grouping the railways on the lines recently adopted by Great Britain, and we recommend that the preparation of a scheme be taken up forthwith. We consider the existing systems could well be amalgamated into say five groups, but although certain lines would appear to fall naturally into the same group, some time and study may be necessary to evolve the most suitable and economic scheme.'

The Five Groups:

The Inchcape Committee had given no indication as to the constitution of the five groups into which the then existing systems could be amalgamated, but it would appear possible that they had in mind some such grouping as follows:-

- | | |
|------------------------|--|
| a) Southern Group | Madras & Southern Mahratta Railway; South Indian Railway |
| b) Western Group | Great Indian Peninsular Railway; Bombay, Baroda & Central India Railway. |
| c) Eastern Group | East India Railway; Bengal Nagpur Railway; Oudh & Rohilkhand Railway; Eastern Bengal Railway (broad gauge section) |
| d) North Western Group | North Western State Railway |
| e) Trans-Ganges Group | Bengal & North Western Railway, including Tirhoot State Railway; Eastern Bengal Railway (metre gauge section); Assam Bengal Railway; Rohilkhand & Kumaon Railway |

The proposed Southern Group of Indian Railways included Madras and Southern Mahratta Railway and South Indian Railway covering route mileage of 4891. Mysore State Railway was not made a part of it, as it was owned and operated by the Mysore Durbar.

Regrouping or reorganization took place only after Independence of India in 1947. The process was set after the partition and thus an unnatural division of railways forced on our system. After partition, Indian Railways in 1947 comprised of 13 class I and 35 other class railways ranging from a few miles in length in old Kahtiawar to an extensive route mileage in others.

The chief architect of reorganization was Shri N. Gopalaswamy Ayyangar, the then Minister of Railways and Transport. The main principles of the reorganization were:



1) that each railway should be so formed as to serve as far as possible a compact region,

(2) that the system should be large enough to provide headquarters organization of the highest caliber capable of adopting and assimilating up-to-date improvements in railway technique and equipped with adequate workshop facilities, statistical, training and research institutions, and

(3) that the regrouping should cause minimum disturbance to existing arrangements and should be so phased as to prevent any dislocation or even temporary diminution of the quantity or efficiency of rail transport facilities to the public.

To quote Shri Ayyangar, "The effect of the regrouping scheme on internal administration and operation will itself be of no small importance. The strength of a chain is determined by its weakest link. The reorganization of administration, the tightening up of control, the application of the increased resources of enlarged system to the maximum advantage, the elimination of duplication and waste, the economies in the procurement, utilization and stocking of equipment and materials—all these, to mention only a few items, should help to reduce the overall cost of transportation both to the nation and to the individual. When it is realized that daily we in India carry only $1/5^{\text{th}}$ of a ton mile per head of the population which is only $1/6^{\text{th}}$ of the corresponding figure for Great Britain and as low as $1/50^{\text{th}}$ of that for the United States, it will be appreciated how backward we are."

The Inaugural Function:

On the auspicious occasion of the Tamil New Year Day (April 14, 1951), the integrated Southern Railway system was inaugurated.

The stately Headquarter Building was tastefully decorated. Coloured lights cast a

magical glow on the proceedings. Adding their own glow, were the many luminaries who graced the occasion. There was His Excellency, the Governor of Madras who had been invited to preside over the function. Shri N. Gopalaswamy Ayyangar, the then Minister for Railway and Transport, was the special invitee who was called upon to inaugurate the system. Then there were hundreds of other distinguished guests: Ministers, Judges of the High Court, Railway Officers and other prominent officials. As the function began, a quiet hush fell over the gathering. Shri K.R. Ramanujam, the first General Manager stood up and with quiet dignity welcomed the distinguished guests.

Referring to the integration of the Madras and Southern Mahratta Railway, South Indian Railway and the Mysore State Railway as a rational development, His Excellency, the Governor of Madras said the "new grouping of Railways marks an important milestone in the history of our Railway Administration." It is our hope and trust that this unified administration will lead to greater efficiency and smoothness of working both in the transport of goods and the conveyance of passengers".

In his inaugural address, Shri N. Gopalaswamy Ayyangar stressed the need for amalgamation: "A unification of this nature has been long over due. It was demanded in the interests of the public almost 50 years ago... This integration into one system is of profound significance in the south... The amalgamation of the three Railways into a unified system will immediately release to better utilization, equipment and resources which had been partly immobilized in the individualized working of separate units", he said.

Shri K. Santhanam, the then Minister of State for Transport and Railways, also hailed the formation of Southern Railway as a proud



His excellency, the Governor of Madras Maharaja Shri Sir Krishna Kumar Sinhiji Bhuvasinhi delivering his address at the inauguration ceremony of formation of Southern Railway on 14th April 1951.

Others seen in the picture are from left to right Shri. K. R. Ramanujam, General Manager of Southern Railway, Hon'ble Chief Minister of Madras Shri P. S. N. Kumarasamy Raja, Hon'ble Union Minister Shri N. Gopalasamy Iyengar, Hon'ble Dy. Minister Shri K. Santhanam and Chairman, Railway Board Shri F. C. Budhwar



PT 37156 (earlier PT 11 of SIR) in Southern Railway livery. This locomotive of 2-6-4T design was built by M/s Robert Stephenson & Co. Ltd., New Castle & Darlington in 1936.



WD 430 (American Locomotive Company Ltd., Schenectady, 1943 built) of Madras and Southern Mahratta Railway represents one of the most successful War Department locomotives in India.



record of achievement. "I have no doubt whatsoever that the new Southern Railway will bring advantages to the country as a whole and to South India in particular... Already, the Madras and Southern Mahratta Railway, South Indian and Mysore Railways have a fair record of efficiency. I am sure this record will be bettered by their amalgamation".

Amidst cheers from an august gathering on that solemn evening, an electrically illuminated chart of the newly created Southern Railway System was unveiled. And thus began the long and gloriously successful career of Southern Railway, journey that witnessed some of the most remarkable achievements in India's rail history. A journey, that took millions of passengers to their destination. A journey, that served many industries and enterprises. A journey that helped to augment the socio-economic development of the regions it touched.

Two years later, on April 16, 1953, Indian Railways celebrated its centenary with great fanfare. By now two years have lapsed since the process of reorganization began.

A quick review of the reorganization as reported in the Central Railway Magazine of April 1953 is reproduced below:

The principal advantages expected from regrouping could be broadly classed under three heads, namely, (1) Economics in Administrative costs, (2) Operating economics, and (3) Financial and other advantages. Economy in administrative costs is considered one of the important consequences of railway reorganization. Reduction in the number of administrative units should lead to saving in overhead expenses. Fewer freight tariff areas and fewer railways to account with, in regard to inter-railway transactions lead to corresponding economies in the clerical, operating and accounting departments.

In the field of operation, reorganization of the railways conduces to more effective use of plant and better utilization of locomotives and rolling stock. Reduction in the number of interchange points means greater ease of flow of traffic.

As regards the financial advantages, the finances of a large system would be more stable as the earnings would be more balanced. Secondly, amalgamation should promote better utilization of shop facilities, yards, etc. offering scope for specialization and economics of large-scale production. It is too premature, of course, to assess the results of regrouping in India under these heads. The most direct effects of regrouping that are perceptible today are in the field of railway operation. There has been a rationalization of passenger train services on most of the sections and there have been considerable improvements in the pattern of goods movements. The myth that the scheme of regrouping would result in the major industries of the country suffering on account of lack of sufficient transport has been exploded, as there has been no diminution in the number of wagons supplied to the various industries for carrying their goods. Efforts to introduce a rational system of working in matters of rates and claims have been undertaken on all the Indian Railways and they are showing definite signs of improvement. If the experiences of other countries like U.K., U.S.A., and France in the matter of railway regrouping is any guide, we can expect, in the course of time, the other advantages also to accrue.

The re grouping of Indian Railways can be claimed to have been achieved in a peaceful and orderly manner, without causing the least hardship to the public or to the vast army of railway personnel.



The Southern Railway zone (9,654 route km) was the first zone to be formed. Created on April 14, 1951 by the merger of the Madras and Southern Mahratta, the South Indian and the Mysore State Railways the economic and geographical factors of this zone facilitated an early-integrated network. This amalgamation was a major step towards streamlining and organizing the working pattern of the Railway system.

Shri K.R. Ramanujam was the first General Manager of the newly formed Southern Railway.

Major events on Southern Railway between 1952 and 1965 are listed below:-

1. Ernakulam - Quilon Metre Gauge Line - turning of first sod by Shri Jawaharlal Nehru, Prime Minister of India on 24.12.1952.
2. Formation of Divisions in Southern Railway on 16.05.1956.
3. Opening of Renigunta - Gudur Broad Gauge Section on 23.08.1957.
4. Opening of Ernakulam - Quilon Metre Gauge Line on January 1958
5. Establishment of S&T Workshop, Podanur on 1958.
6. Conversion of DC 1500 V Electrified System to 25 KV AC System from Madras Beach to Tambaram in January 1965

The divisionalisation came to Southern Railway in 1956. The divisions formed were: Royapuram, Olavakkot, Mysore, Tiruchchirappalli, Madurai, Guntakal, Vijayawada and Hubli.

On 2nd October 1966, South Central Railway was carved out of Central Railway and the Southern Railway. Southern Railway lost three of its prominent divisions viz. Vijayawada, Guntakal and Hubli.

Prior to Divisionalisation in 1956, the Southern Railway and earlier its constituent units were managed on District System. The three major branches viz., Engineering, Traffic and Mechanical managed their affairs from a number of districts. Most often the districts were at common places. Royapuram, Vijayawada and Podanur were important districts of Madras Railway Company and later of Madras and Southern Mahratta Railway Company while Tiruchchirappalli and Madurai were the important districts of South Indian Railway. Mysore was managed on the principle of one district-one railway system.

After formation of Southern Railway and introduction of Divisional System, there was a demand to have a divisional office in the State of Kerala. The offices at Podanur were therefore shifted to Olavakkot (now Palghat). Other centres viz., Royapuram, Mysore, Tiruchchirappalli and Madurai acquired the status of divisional headquarters.

21. Southern Railway (1966–2003)

South Central Railway was formed on 02.10.1966. Vijayawada, Guntakal and Hubli divisions were parted from Southern Railway. The Southern Railway was now left with 5 Divisions viz., Madras (Royapuram), Mysore, Olavakkot (Palghat), Tiruchchirappalli and Madurai.

Three major projects undertaken by Southern Railway after 1966 need special mention:

Mangalore-Hassan Line:

Mangalore, a port on the west coast is geographically the nearest to Bangalore and Mysore and could command an area of about 90,000 square km. The necessity for a direct rail-link to connect Mysore was felt as early as in 1880. Madras Government in collaboration with Mysore Durbar ordered reconnaissance of various routes in 1892, the surveys were conducted from 1893 to 1899, and the project was however shelved for better times. For next fifty years, the subject kept on coming up for discussions, but without any results.

A project report and estimate was submitted to the Railway Board in 1957, recommending the project for construction as a Broad Gauge line. More details of this report are given below in a tabulated form :

Section	Metre Gauge			Broad Gauge		
	Length (in km)	Ruling Gradient	Sharpest curve	Length (in km)	Ruling Gradient	Sharpest Curve
1. Plateau Section	45.02	1:100	4°	45.06	1:100	4°
2. Ghat section	48.70	1:50	10°	74.03	1:50	10°
3. Plains section	103.51	1:100	4°	99.78	1:100	4°
Total	197.23 km			218.87 km		
Cost	Rs.9.39 crore			Rs.13.88 crore		
Rate of return	About 1%			About 1%		

In 1963, the Railway Board sanctioned construction of a mixed gauge (BG and MG) line connecting Mangalore station and the proposed port site at Panambur. This 14.67 mile long line was to cost about Rs.1.55 crore. This line was opened on 14.10.1972.

In August 1964, the Railway Board approved construction of Hassan-Mangalore rail-link as a metre gauge single line with BG substructure for bridges and BG profile for tunnels. Work began in February 1965. The plateau section from Hassan to Sakleshpur (42 km) was opened for traffic on 26th May 1976 the section from Mangalore to Subrahmanya Road (92 km) was opened for traffic on 27th February 1977. The Ghat section from Sakleshpur to Subrahmanya Road (55 km) was completed and opened for traffic on 20th May 1979. The project was completed at a total cost of Rs.51.88 crore. The line is of extreme scenic beauty with 57 tunnels and highest point at 967 m. above mean sea level.

After a lapse of only 15 years, the Railway Board in October 1994, sanctioned surveys for gauge conversion of Arsikere-Hassan-Mangalore section. The project was now estimated to cost about Rs.200 crore - about Rs.35 crore for conversion of Arsikere-Hassan section of 47 km and about Rs.165 crore for conversion of Hassan-Mangalore section of 189 km. The present status of the project is -

- Arsikere-Hassan line converted and opened on 23.08.1996.
- Hassan-Sakleshpur line converted and opened on 26.01.1998.
- Work is in full swing on i) Sakleshpur - Subrahmanya Road and on
ii) Subrahmanya Road - Kabakaputtur -Kankanadi line.



Tirunelveli-Nagercoil-Trivandrum and Nagercoil - Kanniyakumari.

In 1955, the Railway Board sanctioned a survey for a MG line between Tirunelveli and Trivandrum and a branch from Nagercoil to Kanniyakumari. It was estimated that this 114.3-mile line will cost about Rs.4.6 crore and may give a return of about 5%. In 1961, the cost of the project was revised to Rs.6.3 crore. The Railway Board again asked to update the survey report in 1969. This time, Southern Railway submitted estimates for MG and BG routes as Rs.12.99 crore and Rs.14.54 crore with rate of returns at 6.5% and 8.0% respectively. In April 1972, the Railway Board sanctioned construction of a BG line from Tirunelveli to Trivandrum via Nagercoil and a branch line to Kanniyakumari at a cost of Rs.14.54 crore.

The construction of the line was inaugurated by the Honourable Prime Minister of India at Kanniyakumari on 6.9.1972. Both these sections were opened in April 1979. A beautiful plaque reads as below:

CONSTRUCTION OF TIRUNELVELI - KANNIYAKUMARI - TRIVANDRUM

BROAD GAUGE RAILWAY LINE
This Inaugural Stone was unveiled by

Shrimati INDIRA GANDHI
Prime Minister Of India

On 6th September 1972

in the Presence of

Shri T. A. PAI
Minister Of Railways

Shri M. KARUNANIDHI
Chief Minister Of Tamil Nadu

Shri C. ACHUTHA MENON
Chief Minister Of Kerala

This was followed by inauguration of gauge conversion of Trivandrum - Ernakulam section by Prime Minister of India. Another plaque kept at Trivandrum station reads as below: -

TRIVANDRUM - ERNAKULAM CONVERSION

INAUGURATION

OF BROAD GAUGE LINE

By

Smt. INDIRA GANDHI
Prime Minister Of India

ON 13TH SEPTEMBER 1976

Three years later in 1979, The Kanniyakumari - Trivandrum Section was also opened again by the then Prime Minister of India. The plaque kept at Kanniyakumari station reads as below: -

KANNIYAKUMARI - TRIVANDRUM RAILWAY

BROAD GAUGE LINE

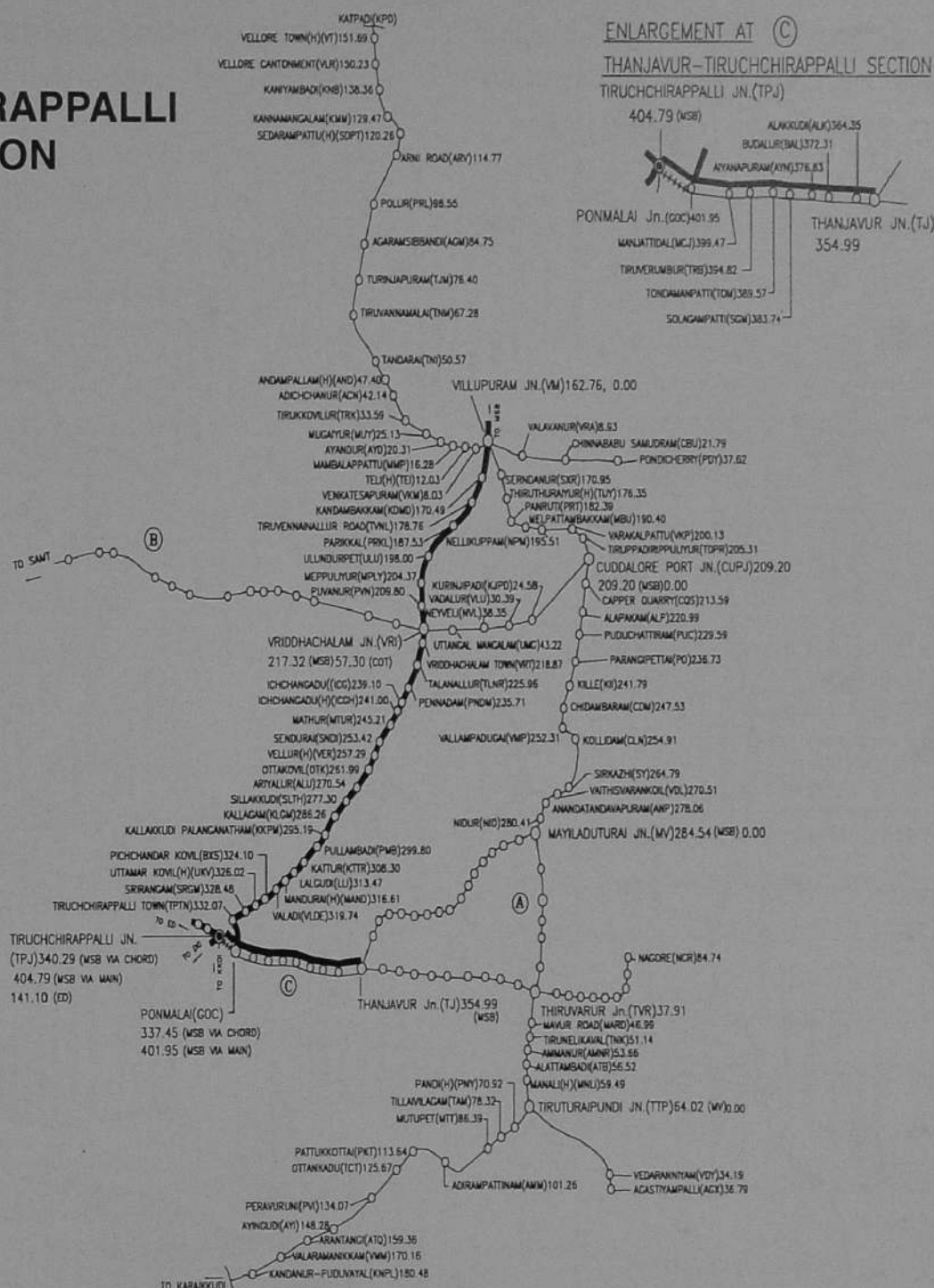
INAUGURATED BY

Shri MORARJI R. DESAI
Prime Minister Of India

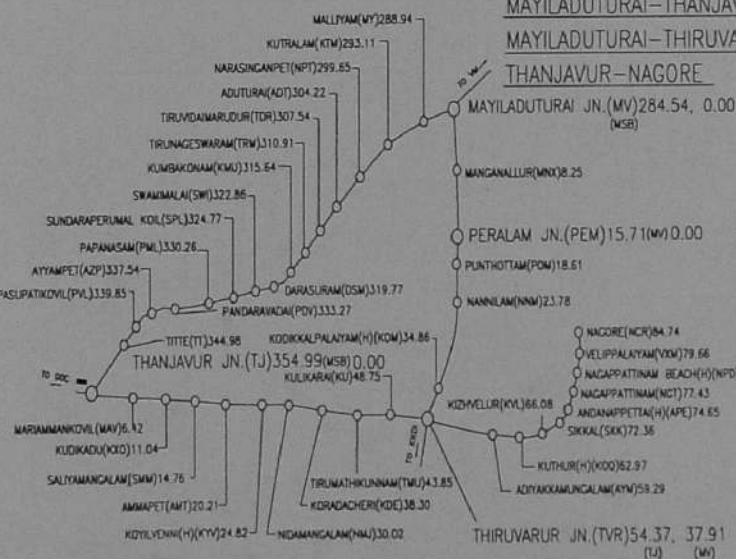
ON 15TH APRIL 1979

Three major inaugurations, all by the Honourable Prime Ministers!

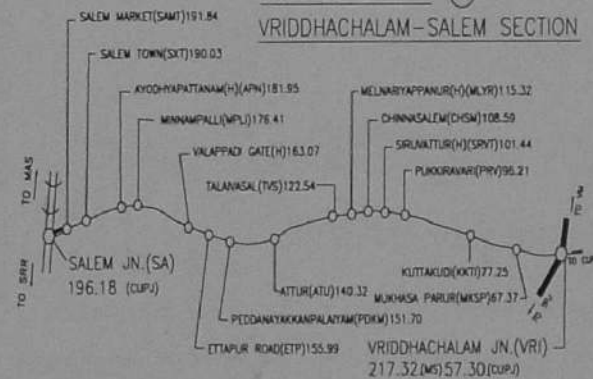
ENLARGEMENT AT (C)
THANJAVUR-TIRUCHCHIRAPPALLI SECTION
TIRUCHCHIRAPPALLI JN.(TPJ)



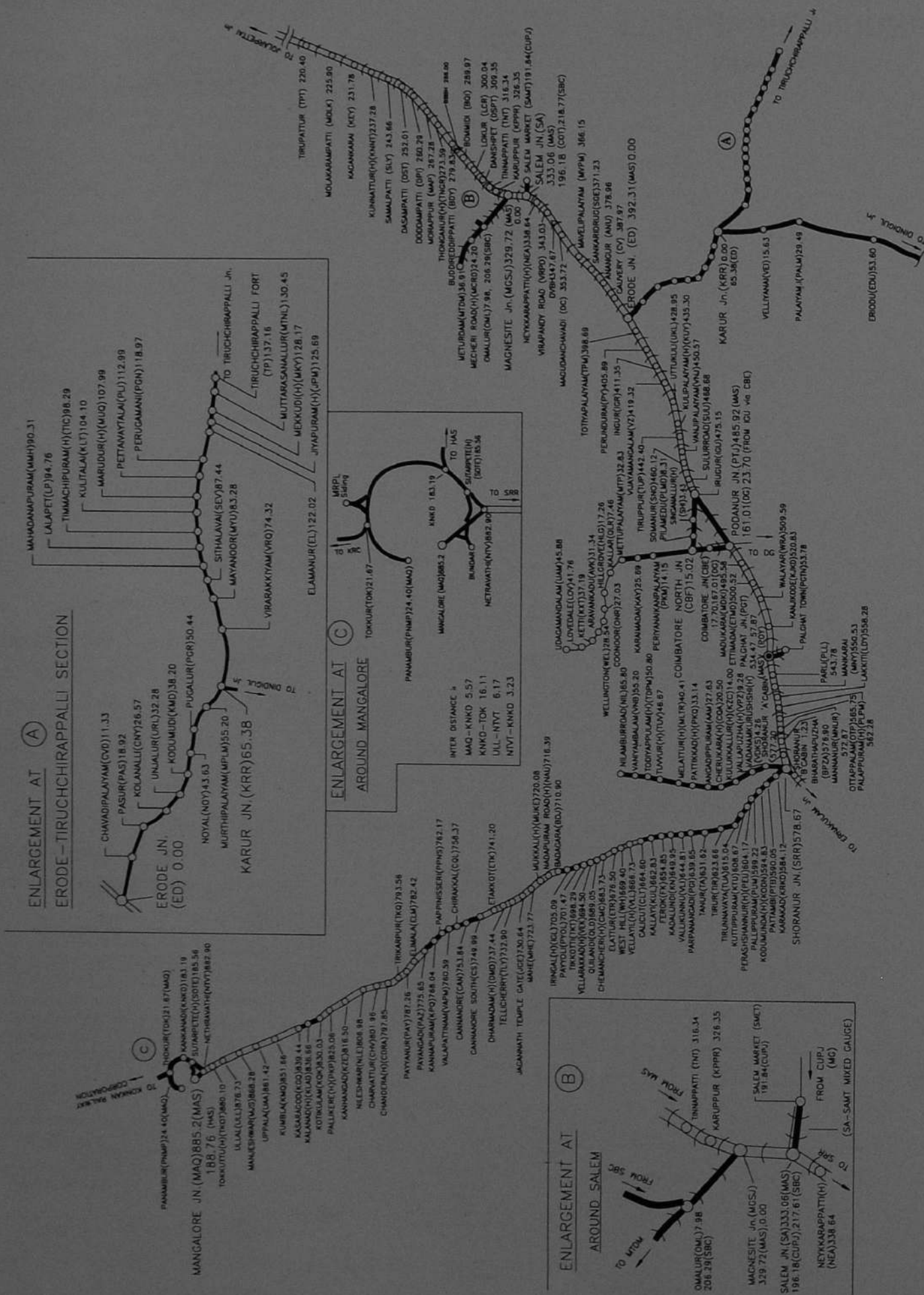
ENLARGEMENT AT (A)
MAYILADUTURAI - THANJAVUR
MAYILADUTURAI - THIRUVARUR,
THANJAVUR - NAGORE



ENLARGEMENT AT (B)
VRIDDHACHALAM-SALEM SECTION



PALGHAT DIVISION





Ernakulam-Kayankulam coastal line via Alleppey:

A traffic survey was conducted for 97 km long Ernakulam-Kayankulam coastal line via Alleppey in 1971. It was estimated that this line on BG alignment would cost about Rs.10.0 crore and may not be remunerative. Fresh surveys were conducted in 1975-76 and in August 1979, the Railway Board sanctioned a new BG line from Ernakulam to Alleppey. In 1982, the estimate was sanctioned at a cost of Rs.15.1 crore to be revised to Rs.38.62 crore in 1986. The line Ernakulam to Alleppey was opened for traffic on 15.10.1989, the cost escalating to Rs.59.16 crore.

Alleppey-Kayankulam extension on BG alignment was sanctioned in April 1982. The estimate was for Rs.11.11 crore in June 1984 to be revised to Rs.36.80 crore in September 1989. Three years later, the cost further escalated to Rs.53.6 crore. The line between Alleppey and Kayankulam was opened for traffic on 21.11.1992.

With the divisionalisation of railways in 1956, Southern Railway began its score with eight divisions with headquarters at Madras (Royapuram), Hubli, Bezwada, Guntakal, Olavakkot (Palghat), Madurai, Tiruchchirappalli and Mysore. South Central Railway on its formation in 1966 knocked out three of the eight divisions viz., Hubli, Bezwada and Guntakal. In 1979, Trivandrum Division was formed from the then Olavakkot and Madurai Divisions. Two years later in 1981, Bangalore Division was carved out mostly from the then Mysore Division. For next two decades, there were no major administrative changes. Southern Railway operated with its seven divisions. Come 2003 and two divisions viz., Mysore and Bangalore became the parts of the newly formed railway,

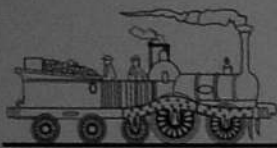
these divisions are covered in the chapter 'South Western Railway'. More details of the other five divisions are given below:

Palghat Division:

The Palghat division has the largest spread on Southern Railway. It is in the form of 'U', one arm extending up to Mangalore and another arm extending up to Jolarpettai. Palghat division serves 16 districts and 3 states viz. Kerala, Karnataka and Tamil Nadu. There are 126 stations and the route km is 11,032.

The division was formed on 31.08.1956 in the title of Olavakkot. The divisional office in its present location was opened in August 1962. It is now known as Palghat division. Some of the important milestones of the Olavakkot / Palghat division is listed below: -

YEAR	EVENT
1956	Olavakkot Division opened.
1958	Control Office shifted from Podanur to Olavakkot.
1962	Divisional Office opened.
1972	Jolarpettai-Salem and Salem-Erode doubling work completed.
1973	Podanur-Palghat doubling work completed.
1975	Erode-Tiruppur doubling work completed.
1976	Tiruppur-Irugar doubling work completed.
1979	Shoranur-Cochin Harbour Terminus section handed over to the newly formed Trivandrum Division.
1984	Palghat-Shoranur doubling work completed.
1988	Karur-Dindigul-BG line opened.



- 1991 Tiruppur-Salem line electrified.
- 1992 Salem Erode line electrified.
- 1994 Twin single line between Podanur-Palghat opened.
- 1995 Palghat-Shoranur line electrified.
- 1996 Erode-Palghat line electrified.
- 1997 Palghat-Palghat Town line electrified.
- 1999 Ullal-Kasargod doubling completed.
- 2000 'X' class locos were re-built and successfully run on Nilgiri Mountain Railway.
- 2000 Calicut-Tikkotti and Chruvattur-Pazhangadi double line completed.
- 2002 Main line Electrical Multiple Unit service started.
- 2002 Oil fired locomotives test fired and made operational in Nilgiri Mountain Railway.

Trivandrum Division:

Trivandrum division was formed on 2nd October 1979 carving out the Shoranur - Cochin Harbour Terminus Section from the erstwhile Olavakkot Division and Ernakulam - Trivandrum - Kanniyakumari Section from Madurai division. The new lines in Nagercoil - Tirunelveli section, the Ernakulam - Alleppey - Kayankulam section and the Trichur - Guruvayur section were completed and opened to passenger traffic after the formation of this Division.

The doubling of track between Kayankulam and Quilon Junction has been completed in 1996. The doubling of track between Quilon Junction and Trivandrum Central has been completed in 2000. The Railway Electrification works between Shoranur and Ernakulam Junction has been completed in 2000. The electrification is on hand between

Ernakulam Junction to Trivandrum both via Kottayam and Alleppey. These works are targeted for completion by March 2004.

Some of the important events are listed below: -

YEAR	EVENT
1979	Trivandrum-Nagercoil Kanniyakumari - New line opened.
1981	Nagercoil - Tirunelveli - New line opened.
1986	Shoranur - Ernakulam - Doubling completed
1989	Opening of Ernakulam - Alleppey Broad Gauge Line
1992	Inauguration of Alleppey-Kayankulam Broad Gauge Line
1994	Trichur - Guruvayur - New line opened.
1994	Kayankulam - Karunagapan - Doubling completed.
1995	Karunagapan - Quilon - Doubling completed.
2000	Quilon - Trivandrum - Doubling completed.
2000	Inauguration of Electric Traction between Trichur and Ernakulam

Madurai Division:

Madurai division was formed on 16.05.1956 and this is the largest on Southern Railway with 1448 route kilometers (BG 258 and MG 1190). It extends over 11 districts of Tamilnadu and 2 districts of Kerala, covering 45% of the area of Tamilnadu and 18% of Kerala. It serves 40% of the population of Tamilnadu and 16% of Kerala. The area served by Madurai division represents the traditional centres of Tamil language, art and culture. It

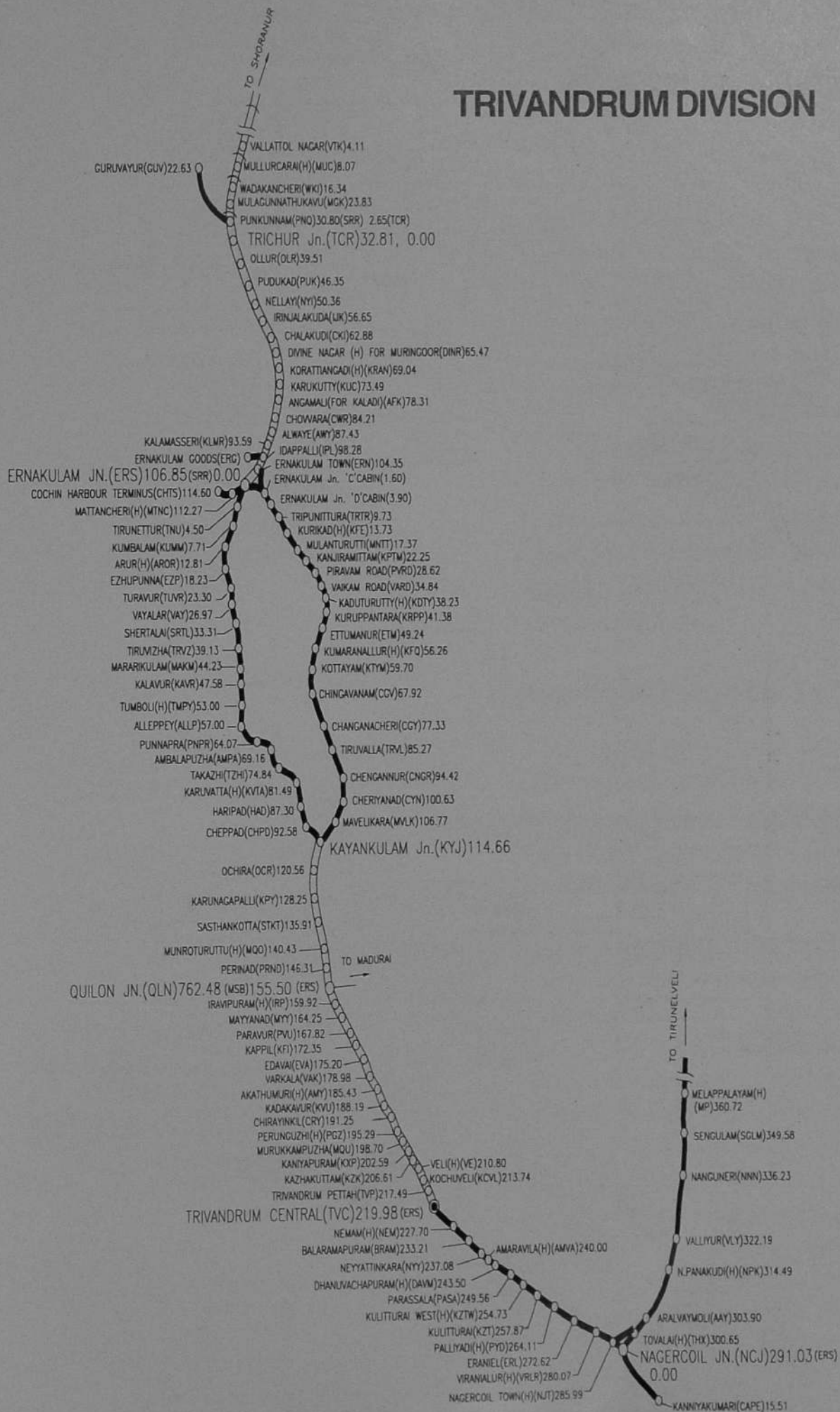


Shri Jawaharlal Nehru, Prime Minister of India turning the first sod for laying Ernakulam-Quilon
MG line on 24th December 1952.

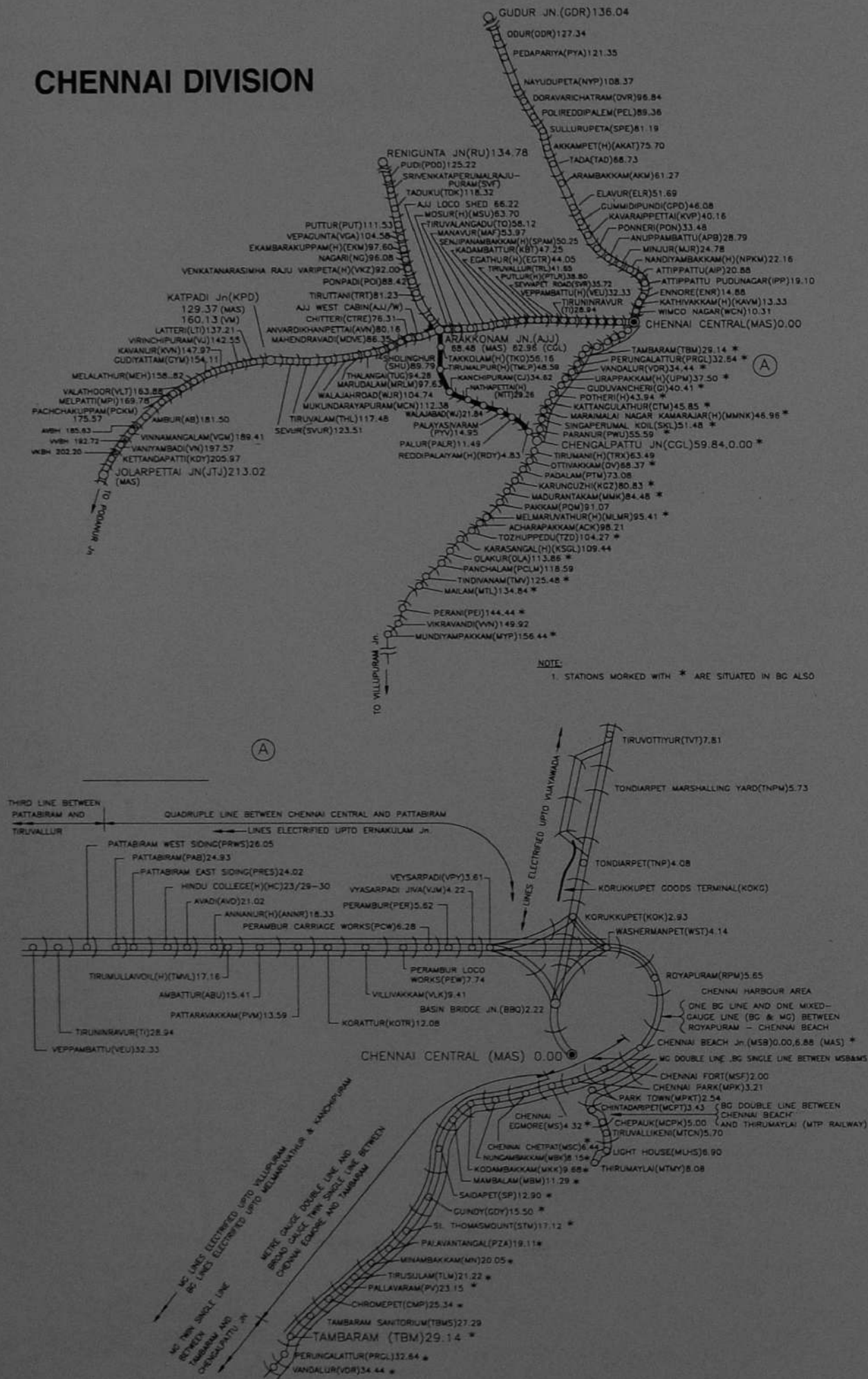


Shri Jawaharlal Nehru, Prime Minister of India discussing with the Maharaja of Cochin after turning the first sod for laying Ernakulam-Quilon MG line on 24th December 1952.

TRIVANDRUM DIVISION



CHENNAI DIVISION





has a very large number of pilgrimage centers and other places of tourist interests.

The city, situated on the banks of the River Vaigai, is the second largest in Tamilnadu. It is also a burgeoning industrial center with its famous textile mills, engineering industries and vast university campus. Hot and humid, Madurai has the typical climate of the rest of the Deccan plateau. In summer, May is the hottest month. The winters are not worth the name - December, January and February - for they are only slightly less hot than the summers. Monsoons - September, October, and November - are wet with intermittent showers.

Important events after 1966 are tabulated below:

YEAR	EVENT
1992	Dindigul-Madurai MG line was converted into BG
1993	Inauguration of Karur-Dindigul-Madurai-Tuticorin Broad Gauge Project
1993	Madurai-Tuticorin MG line was converted into BG
1975	Broad Gauge conversion of Ernakulam - Quilon Metre Gauge Section
1976	Inauguration of Trivandrum - Ernakulam Broad Gauge Section
1999	Tiruchchirappalli-Dindigul MG line was converted into BG
2003	Virudunagar-Rajapalayam MG line converted to BG and opened for traffic

Chennai Division:

Chennai Division was formed on 31.08.1956 as Madras Division with its offices at Royapuram. At present it serves the Northern parts of Tamil Nadu and a small portion of

Southern Andhra Pradesh. This division has a route kilometrage of 844 and track kilometrage of 2133 of both MG and BG put together. All the sections except a very small BG line between Arakkonam and Kanchipuram are electrified with 25 KV AC. The double line metre gauge suburban section was electrified with DC during 1931 and subsequently converted into 25 KV AC during 1967. The MG EMU services are now run between Madras Beach-Tambaram-Chengalpattu. This is the only MG EMU service in operation in the country.

Chennai Port Trust, an Indian Railway Conference Association or IRCA member, has its own Railway viz. Port Trust Railway which plays a key role in the day to day operations of Chennai division. This port handles mainly coal, ore and container traffic.

Mass Rapid Transit System:

The Metropolitan Transport Project, Chennai established in 1971 conducted a detailed survey and recommended an elevated Mass Rapid Transit System (MRTS) in the space available along the Buckingham Canal.

MRTS, Phase I from Chennai Beach to Tirumylai was completed in two parts: between Chennai Beach and Chepauk inaugurated on 16.11.1995 and between Chepauk and Tirumylai inaugurated on 19.10.1997. The Chennai Beach - Tirumylai section covers a length of 8.97 km of which 6.22 km is on elevated structure and the balance on the surface. Of the total eight stations, five are on the elevated stretch. Designed as a BG double line system, the MRTS have 25 KV AC traction. The first such elevated city railway system, the Chennai MRTS is the single largest pre-stressed concrete construction work in India involving casting and launching of 602 PSC cylinders of span 10m to 20m, weighing 150t to 280t each.



MRTS Phase II from Tirumylai to Velachery (presently under progress) covers a length of 10.8 km of which 7.5 km is on elevated structure. Of the nine stations, seven are on the elevated stretch. Work on phase II project is proceeding at a brisk pace and is likely to be completed shortly.

Important events that took place in Chennai Division in last three decades are listed below:-

YEAR	EVENT
1979	Electrification of Madras - Gummidipundi Section
1979	Electrification of Madras Beach - Korukkupet - Madras Central Section
1979	Electrification of Madras - Tiruvallur Section
1982	Electrification of Tiruvallur - Arakkonam Section
1984	Electrified train services between Madras and Katpadi.
1987	Inauguration of EMU services : Madras - Avadi
1991	Inauguration of MRTS Project between Madras Beach - Park Town
1994	Introduction of first Shatabdi Express between Madras and Mysore
1995	Inauguration of Madras Beach-Tambaram Broad Gauge Line
1997	Inauguration of MRTS Project between Chennai Beach and Tirumylai

Tiruchchirappalli Division:

Tiruchchirappalli Division formed in 1956, encompasses Tiruchchirappalli, Thanjavur, Nagappattinam, Vellore, Tiruvannamalai, Salem, South Arcot, Villupuram, Pudukkottai and Ariyalur Districts of Tamil Nadu and the Union Territory of Pondicherry.

The area served by the division is a veritable land of Temples, many of these dates back to the period of Chola, Pallava and Vijayanagar dynasties and the Naik chieftains. This division also serves a major Christian pilgrimage centre - Velankanni Church and a major Muslim shrine at Nagore. Some of the important centers of Tourist and Pilgrim interest in the division are: Tiruchchirappalli, Srirangam, Tiruvannamalai, Thanjavur, Mayiladuturai, Tiruvarur, Chidambaram, Nagore and Nagappattinam.

The division has a route kilometrage of 1176 km, of which 939 km is on MG and 237 km is on BG. Part of the yard at Villupuram is with MG Electric traction, track kilometer of which is 2.13 km

The division has 159 Stations, 126 on MG and 33 on BG. Out of the 159 stations, 100 are block stations, 22 are flag stations and the remaining 37 are train halts. The Division has single line working except for a small stretch of 2.8 km of double line working between Tiruchchirappalli and Ponmalai. The section between Tiruchchirappalli and Thanjavur has both BG and MG running in parallel.

Some of the important events of in last 20 years are listed below:

YEAR	EVENT
1987	First solid state interlocking in Indian Railways at Srirangam Station
1988	Inauguration of Karur-Dindigul Broad Gauge Line
1998	Inauguration of Tambaram - Tiruchchirappalli Broad Gauge Line
1999	Opening of Tiruchchirappalli - Dindigul Broad Gauge Line



2000 Commissioning of optical fibre communication link between Villupuram and Tiruchchirappalli.



Southern Railway: Salient Features

(as on 31.03.2003)

Route and Track (km)

State/UT	BG	MG	Total Route km	Total Track km
Tamilnadu	2071	2109	4180	4981
Pondicherry	0	11	11	11
Andhrapradesh	301	0	301	445
Kerala933	117	1050	1502	
Karnataka	1349	305	1654	1731
Total	4654	2542	7196	8669

Finance

(Figures in crore of Rs.)

	99-2000	2000-01	2001-02	2002-03
Capital at charge	2965.63	3311.28	3773.92	3773.92
Traffic Earnings	2338.27	2600.25	2606.97	2852.51
Working Expenses	2174.74	2425.18	2507.69	2618.96
Contribution to Pension Fund & DRF	508.27	715.91	750.60	763.13
Surplus	166.99	175.61	106.47	237.90
Operating Ratio	114.74%	120.80%	124.98%	118.57%

Freight Traffic

(in million tonnes)

	1999-2000	2000-2001	2001-2002	2002-2003
Originating Freight Traffic	29.508	30.090	24.880	24.069

Passenger Traffic

(in millions)

No. of Passengers Originating	1999-2000	2000-2001	2001-2002	2002-2003
Suburban	219.62	231.89	241.87	223.60
Non-Suburban	203.75	235.00	250.44	241.51
Total	423.37	466.89	492.31	465.11

Rolling Stock Holding

	BG	MG
Passenger coaches	3625	761
Wagons Owned (in 4-Wheeler units)	11713	1369

Locomotives

	BG	MG	Total
Diesel	309	96	405
Electrical	206	18	224
Steam	-	8	8
Total	515	122	637

Electrification

	Completed	In Progress
Track km	3649	520
Route km	1460	313

No. of stations

Block Stations	505
Flag Stations	87
Halt Stations	142
Total	734

Average no. of trains/day

	BG	MG
Suburban	316	213
Mail/Express	152	18
Passenger	227	119
MRTS	118	-
Total	813	350

Staff Strength

	Sanctioned	Actuals
Group A	663	663
Group B	477	456
Group C	75789	67193
Group D	36830	33976
Total	113759	102288

Staff Welfare Activities

Schools Run	3 Higher Secondary, 8 High and 4 Primary Schools
Student strength	8528
Teachers strength	298
Subsidised Hostel	1
Railway Institutes	36
Officers Club	8
Holiday Homes	8
Co-operative Credit Society	2
Canteen	21
Handicrafts Centres	29
Homeopathy Dispensaries	8
Co-operative Stores	20

22. Project Uni-Gauge

Lord Dalhousie's dictum of 'One and Only One Gauge' had a short life. In 1872, only after twenty years from the date of the dictum, the Metre Gauge was established as second standard gauge for the British India. The growth of MG was commendable in all respects. A late runner by 20 years, in next 30 years, it surpassed the BG track in route Kilometres. It was more widely spread and was serving the hinterland in most economic manner. A number of unprofitable BG lines were converted into MG without any ceremony or celebration. On the Southern peninsula, the major conversions from BG to MG were through the agency of the South India Railway Company. The earliest sections converted were from Nagappattinam to Tiruchchirappalli and right through to Erode. It was an era of proving that MG lines could be as efficiently managed as the celebrated BG lines.

This scenario continued till 1970s. Come 1980s and a serious debate took place and once again Lord Dalhousie's dictum 'One and Only One Gauge' was reestablished. Initially it was felt that conversion would be done at very marginal costs, only to realize the fallacy later.

Southern Railway took lead in gauge conversion and the decades of 1980s and 1990s virtually marginalized the metre gauge lines to non-entities. With the march to the new millennium, the left out portions are also being converted to BG. A few of the historical conversion projects need special mention.

a) Ernakulam - Quilon - Trivandrum gauge conversion:

In February 1964, the Chief Minister of Kerala stressed the need for converting the MG line from Ernakulam to Trivandrum on the ground of the break of gauge at Ernakulam involving transshipment of through traffic. In May 1969,

the Railway Board sanctioned traffic survey for gauge conversion. In December 1971, the Railway Board sanctioned the conversion estimate for this 220 km long line at a cost of Rs.13.6 Crore. The Ernakulam - Quilon section was opened on BG alignment on 24.11.1975 and the Quilon - Trivandrum section on 14.09.1976.

b) Karur-Madurai new BG line (135.6 km) and conversion of Madurai-Tuticorin/Tirunelveli (188.3 km)

In 1966, it was felt that the traffic needs at the end of Fourth five-year plan and during Fifth plan period could be met by providing a new BG line from Salem to Madurai via Karur and Dindigul and by concurrent conversion of Madurai-Tuticorin/Tirunelveli section to BG. The portion from Dindigul and Madurai was to be retained to enable the connectivity of MG line. In 1981, this project got the approval excepting for the new line from Salem to Karur.

The new BG line (73.97 km) from Karur to Dindigul was opened for traffic on 6.8.1988. The parallel BG line (64.32 km) from Dindigul to Madurai was opened for traffic on 14.4.1993.

The conversion from MG to BG of Madurai -Maniyachchi-Milavittan-Tuticorin and of Maniyachchi-Tirunelveli (Total 188.29 km) was completed and opened for traffic on 21.10.1983.

c) Guntakal-Dharmavaram-Bangalore City

This project for providing a separate BG line by the side of the existing MG line from Guntakal to Dharmavaram (101.76 km) and conversion of the existing MG line between Dharmavaram and Bangalore City (178.53 km) was sanctioned in 1971. The Railway Minister



formally inaugurated the work on 5th February 1972. The conversion with minimum facilities was commissioned on 26th January 1983.

d) Salem - Bangalore

Salem-Bangalore section connects two important business centres and was served by MG line 232 km in length. The conversion project envisaged making use of BG line from Salem to Omalur, forming part of the Salem-Mettur Dam branch line. At the Bangalore end, instead of following the circuitous route via Banaswadi and Yeshvantpur, the newly converted BG line joins at Baiyyappanahalli. By this method, the route length between Bangalore City and Salem along the BG alignment came out to 213.3 km, about 18 km shorter than the MG alignment.

Conversion between Salem and Baiyyappanahalli was completed and the section was opened for traffic on 12.1.1997.

e) Bangalore City - Mysore

In 1971, Southern Railway proposed Bangalore City - Mysore section (138 km) for conversion to BG. The Railway Board sanctioned the project in April 1979 and the work started in May 1979. The conversion work was completed and commissioned for traffic on 19.2.1993.

f) Chennai Beach - Chengalpattu - Villupuram conversion.

Under the uni-gauge policy, no survey was sanctioned and the work was included in the supplementary budget of Works Programme of 1992-93.

Chennai Beach - Tambaram section was converted and opened for traffic on 2.4.1998, while the extension to Villupuram was opened on 1.9.1998.

The gauge conversion of the branch line between Chengalpattu and Arakkonam was taken up as material modification. This section was opened for traffic on 15.12.1999.

g) Villupuram - Tiruchchirappalli - Dindigul

In 1992, the MG line from Madras to Dindigul was identified for conversion. As part of this, conversion between Madras Beach and Tiruchchirappalli was approved and was included in the Budget of 1992-93 at a cost of Rs.200 crore.

The converted section from Villupuram to Tiruchchirappalli was opened for traffic on 1.9.1998 along with Tambaram- Villupuram section.

Tiruchchirappalli - Dindigul section was opened for passenger traffic on 6.1.1999.

23. South Western Railway

Formation of additional zones including the South Western Zone (SWR) was announced in the Railway Budget of 1996-97. Establishing the headquarters of SWR at Bangalore followed this.

A plaque laid at Bangalore reads as below:

Indian Railways

New South Western Railway

Head Office

Inauguration On 01.11.1996

by Shri H.D. DEVEGOWDA

Hon'ble Prime Minister of India

Presided by

Shri RAM VILAS PASWAN

Hon'ble Minister of Railways

Chief Guest

Shri J.H. PATEL

Chief Minister of Karnataka

Regional imbalances and strong lobbying resulted in a decision to shift the headquarters of SWR from Bangalore to Hubli. The Railway Board sanctioned an estimate for setting up the Zone at Hubli at a cost of Rs.70.34 Crore and work began in full earnest.

In a colourful function on 14th February 2003, Shri Atal Bihari Vajpayee, Hon'ble Prime Minister of India laid the foundation stone for SWR at Hubli. The function was witnessed by a galaxy of dignitaries including Shri T.N. Chaturvedi, Governor of Karnataka,

Shri S.M. Krishna, the Chief Ministers of Karnataka Shri Nitish Kumar, Minister for Railways, Shri Ananth Kumar, Minister for Urban Development and Poverty Alleviation.

While addressing the mammoth gathering, the Prime Minister said, "There should not be any discrimination in regard to the development of any region in the country and the centre had taken every step to ensure overall development of all regions."

Minister for Railways, Shri Nitish Kumar issued the modified notification for including the Hospet-Bellary (including the Bellary-Rayadurg section, 65 km) and Tornagallu-Ranjitpura (23 km) in Hubli Division of the newly formed SWR Zone; and the 328 km long Pune-Miraj-Kolhapur section to go to the Pune Division and the 49 km long Guntakal-Bellary (MG) section to go to the Guntakal Division.

With this, the boundaries of SWR were specified. SWR became operational from 01.04.2003. The publicity brochure brought out by SWR on this occasion gives more details:

Operationalisation Of South Western Railway:

South Western Railway is constituted with headquarters at Hubli amalgamating three Divisions viz. Hubli Division of South Central Railway, Bangalore and Mysore Divisions of Southern Railway. The new zone comprises of 3074 route km and 3181 km of track length carved out from Southern and South Central Railway Zones. The new Zone encompasses Railway routes passing through Karnataka and part of Tamil Nadu, Andhra Pradesh, Goa and Maharashtra. The end points of the new zone are Miraj & Hotgi (border of Maharashtra) in Northern part, while Bellary (Karnataka) and Dharmavaram (Andhra Pradesh) in Western part,



Chamrajanagar (Karnataka), Jolarpettai and Salem (Tamil Nadu) in Southern part and Talguppa and Kankanadi (Karnataka) and Vasco-da-gama (Goa) in Eastern part. The new zone has 395 major and minor stations including halt stations. The important freight centres in the Zone are: Hospet, Tornagallu, Ranjitpura, Bannihatti, Vysanakere and Swamihalli on Hubli Division, Krishnarajapuram, Bangalore, Whitefield, Mandya, Kolar and Malur on Bangalore Division, Mysore, Bhadravati, Sasalu, Davanagere and Ranibennur on Mysore Division. Owing to this location advantage, the zone is all set to become a focal point of rail operations in the future ahead. The flow of traffic is also expected to show a remarkable increase due to the fact that the areas falling under the new zone are known to be very popular tourism destinations.

Hubli Division - The hub of business activity:

Hubli Division came into existence on 31st October 1956 as a part of the Southern Railway. On 2nd October 1966, Hubli Division was merged with the newly formed South Central Railway with transfer of Hubli-Harihar section to Southern Railway and attaching Guntakal Dronachellam section of Southern Railway to Hubli Division. The earlier history of Railways in the region dates back to the period between 1887 and 1890 when the Southern Mahratta Railway Company completed a Metre Gauge Railway line from Pune to Mysore and Vijayawada to Mormugoa. In 1908 the company was amalgamated with Madras Railway Company to form the Madras and Southern Mahratta Railway Company. With the regrouping of Indian Railways, MSM was included in Southern Railway. On further re-organization, Guntakal - Dronachellam section was handed over to Guntakal Division during 1976.

Hubli, located in the Northern Karnataka region, is also known to be a hub of economic activity. With its strategic location as the central node for several areas of Karnataka and Goa, the City is poised to become a major center of operations for the Railways too. The Division serves four States viz., Karnataka, Goa, Maharashtra and Andhra Pradesh with its Headquarters at Hubli. Before reorganization of Zone, it had a total of 1143 km on broad gauge and 239 km on metre gauge, route and 165 Railway stations on its system. Now Hubli Division comprises 1105 km of Broad Gauge and 190 km of Metre Gauge route and 170 stations on its system.

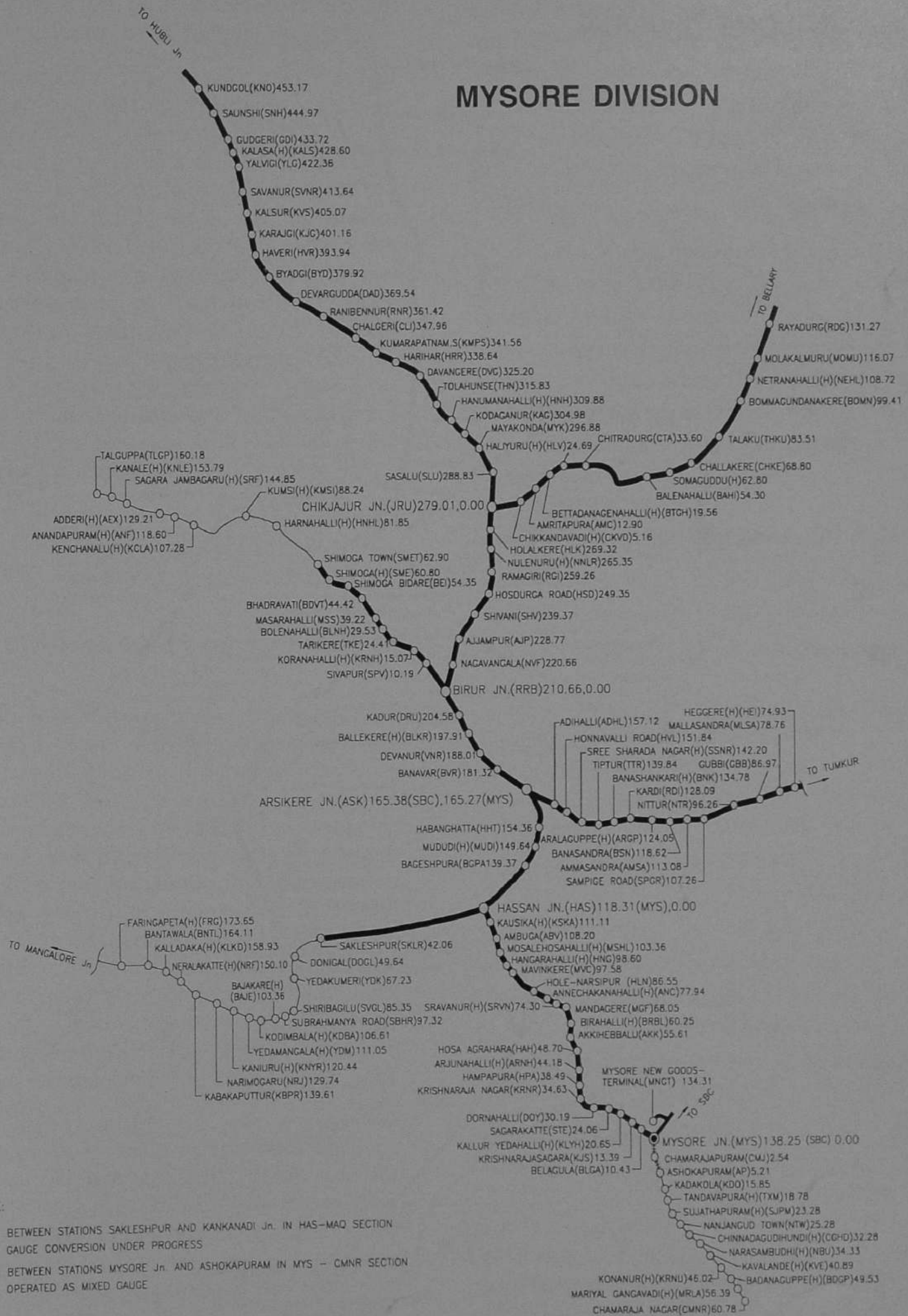
The Division is contributing to the development of this region by transporting essential commodities such as sugar, cement, fertilizer, food grain etc. Pune-Miraj-Kolhapur section (328 km) of the Division in the rich sugar belt is being handed over to Pune Division of Central Railway. The Division serves Mormugoa Port and transports Iron and Manganese Ore from Hospet-Swamihalli section for export.

The geographical boundary is up to Miraj & Hotgi (Maharashtra) on Northern side, Bellary (Karnataka) on Western side, Vasco-da-gama (Goa) on eastern side and Hubli on Southern side. The important freight centres in the Division are Hospet, Tornagallu, Ranjitpura, Bannihatti, Vysanakere and Swamihalli.

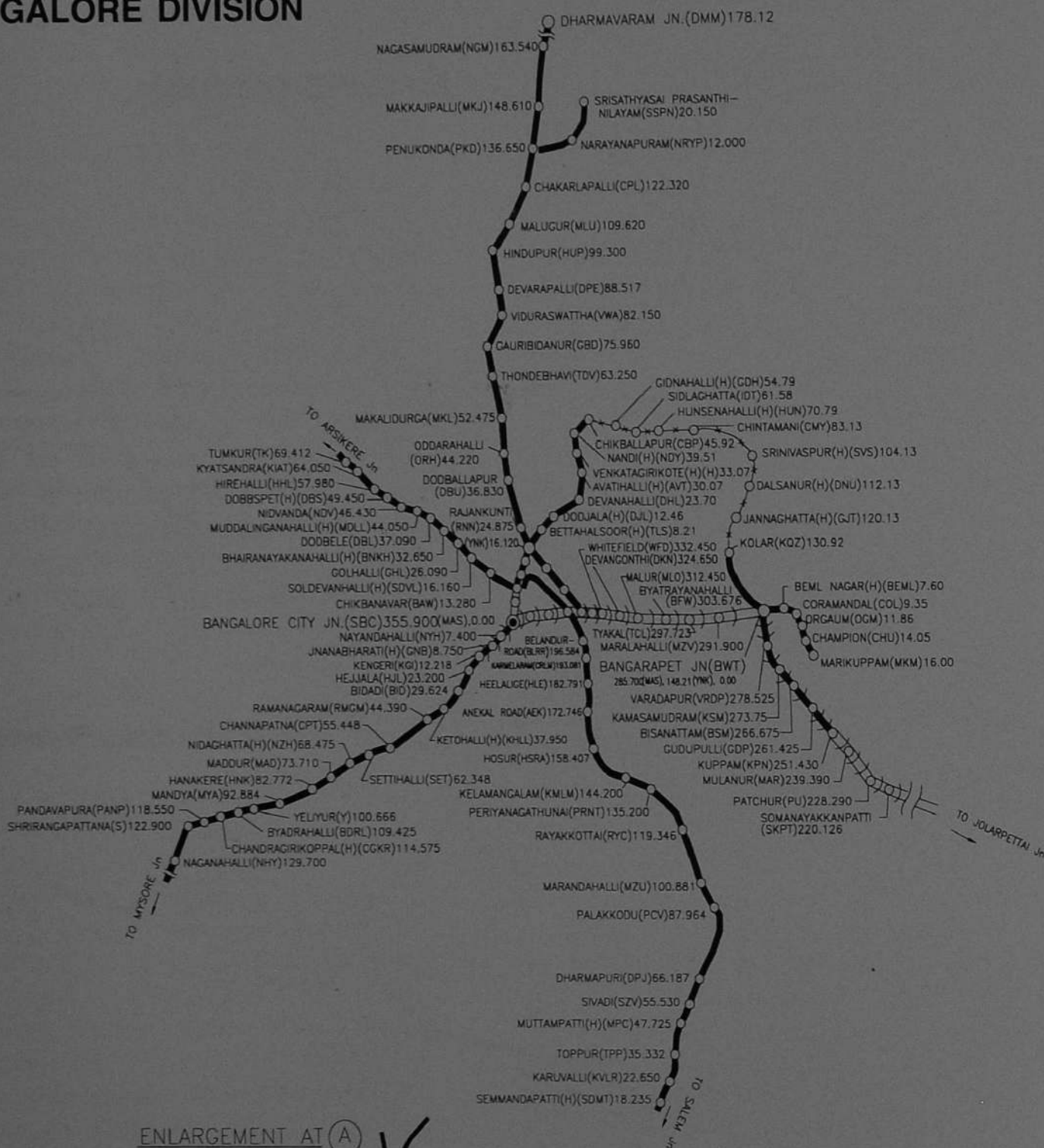
Bangalore Division - The core of rail services:

Bangalore Division was inaugurated on 27th July 1981 to form a part of Southern Railway after bifurcating from the existing Mysore Division. With a length of about 890 route km and 108 Railway stations, the Division handles one-lakh passengers per day. The uni-gauge policy of the Railways led to conversion of the MG and NG lines into Broad Gauge thereby

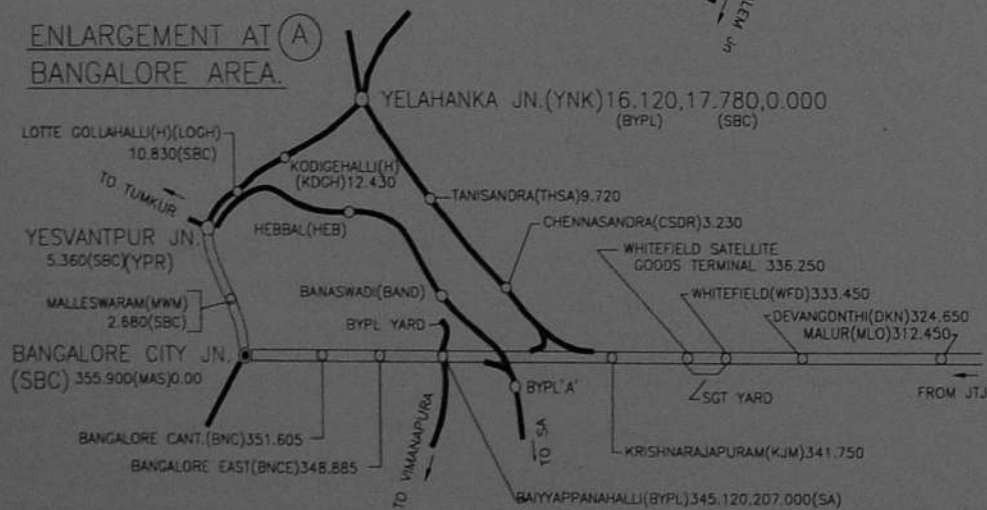
MYSORE DIVISION



BANGALORE DIVISION



ENLARGEMENT AT (A) BANGALORE AREA.





getting the area well connected to all important places by direct train links.

Bangalore City is the major passenger originating terminus fetching well over 70% of the total revenue of the Division. 66 pairs of trains are operated from and to Bangalore City including Rajdhani, Shatabdi and Jan Shatabdi Expresses. With Bangalore City Station getting saturated, a second terminal has been developed at Yeshvantpur. The geographical boundary is up to Tumkur (Karnataka) and Dharmavaram (Andhra Pradesh) on Northern side, Jolarpettai (Tamil Nadu) on Western side, Mysore (exclusive) Eastern side and Salem (Tamil Nadu) on Southern side.

The important freight traffic centres in the Division are Krishnarajapuram, Bangalore, Whitefield, Mandya, Kolar and Malur.

Mysore Division - Land mark for history on track:

The first Railway line constructed in old Mysore State was the Broad Gauge line between Madras and Bangalore in 1864 by the Madras Railway Company. A total distance of 88 km between Bangalore and Bisanatham was in Mysore State. This was subsequently followed up by a Metre Gauge railway line between Bangalore and Mysore which was taken up in 1877 by the then Mysore State Durbar as famine relief work and completed jointly with the Southern Mahratta Railway Company in 1882. In 1919, the State Railways department took over the operations.

Mysore was the headquarters of the erstwhile Mysore State Railway. After Independence, the Railway was taken over by the Central Government in April 1951 and was integrated in Southern Railway along with the Madras and Southern Mahratta Railway and South Indian Railway; Mysore Division came into existence on 31st October 1956.

The Division has a length of 1106 route km with 117 stations including flag and halt stations. Out of these, a length of 800.66 km is Broad Gauge, 152.85 km is Metre Gauge and 5.21 km of Mixed Gauge track. A total of 34 pairs of passenger carrying trains run on the Division.

The important Express Trains originating from the Division are Mysore-Chennai Shatabdi Express, Mysore-Thanjavur Express, Mysore-Chennai Kaveri Express and Mysore-New Delhi Swarnajayanthi Express. The important Freight Centres in Mysore Division are Mysore, Bhadravati, Sasalu, Davanagere and Ranibennur.

South Western Railway Zone - At a Glance

1. Route km	BG: 2,587; MG: 487
2. Running Track km	BG: 2,694; MG: 487
3. No. of Divisions	3; Hubli, Bangalore, Mysore
4. No. of Stations (including Halt Stations)	Hubli-170, Bangalore-108, Mysore-117
5. No. of trains run daily	
a) Mail/Express Trains	BG: 99 - MG: 2
b) Passenger Trains	BG: 137 - MG: 24
6. No. of Officers & Staff	30,300
7. Freight Traffic	11.639 Million Tonnes
8. Passenger Traffic	649 lakhs
9. Freight & Other earnings	Rs.456 Crore
10. Passenger earnings	Rs.421 Crore
11. No. of Workshops	2 (Mysore & Hubli)
12. No. of Diesel Sheds	2 (Hubli & Krishnarajapuram)

Statewise Route km

S.No.	State	BG	MG	Total
1.	Karnataka	2075	487	2562
2.	Andhra Pradesh	227	-	227
3.	Tamil Nadu	173	-	173
4.	Maharashtra	33	-	33
5.	Goa	79	-	79
	Total	2,587	487	3,074



*Traverser 'A' - showing 3 1/2 ton overhead electric travelling crane
at Central Workshops, Golden Rock*



*Erecting Shop - general view of erecting bay taken from over head crane
at Central Workshops, Golden Rock*

24. Railway Workshops

Southern Railway has 8 major workshops. Their location and activities are tabulated below:-

Workshop and Location	Activity
Central Workshop, Golden Rock.	Periodic overhauling (POH) of BG & MG diesel locos, manufacture of BG wagons, cylinder liners & brake blocks, engine block rehabilitation, POH of BG & MG coaches.
Engineering Workshop, Arakkonam	Manufacture of track fittings, brake blocks, cast iron sleepers, bridge girders (riveted & welded), passenger shelters, foot over bridges, points & crossings, glued joints, switch expansion joints, trolleys, lifting barriers for level crossings, dip lorries & other works.
Loco Works, Perambur.	POH of BG Diesel and Electric locos, BG DEMUs, coaches and manufacture of brake blocks.
Carriage Works, Perambur.	POH of BG coaches, wagons, corrosion repairs, manufacture of springs & repair of wheel sets.
S&T Workshop, Podanur.	Manufacture of signaulling relays, point machines, token less block instruments, axle counters, signal machines, colour light signals and signal control panels.
EMU Workshop, Avadi.	POH of BG AC EMUs and MEMUs.
Mysore Workshop	Maintenance of rolling stock belonging to Bangalore and Mysore Divisions.
Loco & EMU Workshop, Tambaram.	POH of MG AC locos and MG AC EMUs.

1) Central Workshop, Golden Rock:

Golden Rock Workshop (GOC) has a unique and important status among the repair workshops of Indian Railways. Constructed in 1926, this shop is spread in an area of 200 acres, has a workforce of 6800 and has an

annual output of Rs.135 Crore. This shop has facilities for overhauling and repairing BG / MG Coaches, Wagons, Diesel Locos, Steam Locos, Steam Cranes and Construction of Wagons. GOC is the only repair workshop in Indian Railways having unique facility of cylinder liner plating and cylinder block reclamation. ISO 9002 Quality certification has been awarded for the entire workshop since 1998. Golden Rock Workshop has the unique distinction of being the only workshop in Indian Railways manufacturing new steam locomotives.

In 2002, GOC bagged prestigious order for manufacture of 320 Container Flat Wagons worth Rs.43 Crore from M/s Container Corporation of India and Manufacturing of 3 Heritage Steam Locos for Darjeeling Himalayan Railway for Rs.5.7 crore

This workshop has also diversified in manufacturing of Civil Engineering items like Curved Switch Rail.

This workshop overhauls locomotives for Public & Private sector units like NTPC, Steel Plants, IRCON, RITES, etc. This Workshop is celebrating its Platinum Jubilee this year.

Railway Board had entrusted the work of developing Relational Data Base Management System (RDBMS) Application Software to Goldenrock Workshop for covering entire gamut of activities related to overhauling of Rolling Stock.

This Software is planned for implementation at 16 Railway Workshops in the first phase and 15 more in next phase in Indian Railways. Important features of Workshop Information System (WISE) are:

1. In-house development.
2. User friendly.



3. Easy installation and customization.
4. Customization reports.
5. Designed both for graphical user Interface and character interface.
6. Basic design is one and common so as to accommodate any type of rolling stock viz., coach, wagon, Loco, EMU etc.
7. In built data integrity and security.

2. Engineering Workshop, Arakkonam

The present Engineering Workshop at Arakkonam had its roots in the Points and Crossings Repair Shop at Royapuram in the year 1885 as a part of the then Madras Railway Company. In 1919, this workshop was shifted to the present location in Arakkonam. The office building of the Deputy Chief Engineer, in charge of the workshops was built in 1959. This workshop caters to the needs of Civil Engineering Department of Southern Railway in manufacturing Points & Crossings, Steel Bridge Girders, Foot Over Bridges, Passenger Platform Shelters, Lifting Barriers, Motor Trolleys, Push Trolleys, Glued Insulated Rail Joints, Flash Butt Welded Rail Panels and other track components. This workshop was awarded with ISO 9002 quality system in July 2002.

This workshop is spread over in 20.43 hectares with a covered area of 3.24 hectares. Over 1400 staff works here in producing an annual turn over worth Rs.25 crore

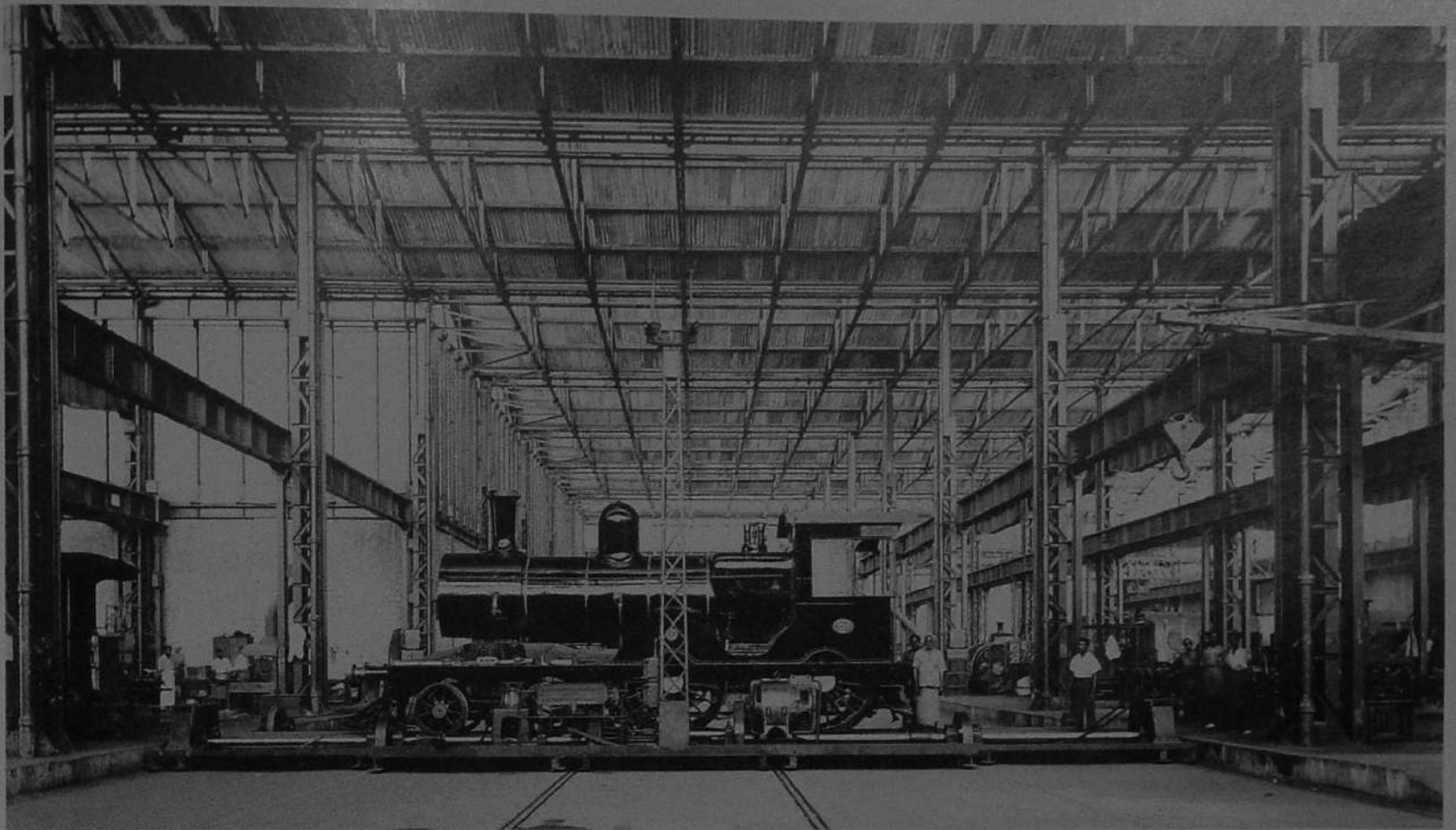
3. Loco Works, Perambur

Till 1932, the Loco Works, Perambur was a part of Central Workshops at Perambur. Due to the increase in the fleet strength of locomotives, coaches and wagons, a separate Loco Works was established in the year 1932 exclusively for overhauling Steam Locomotives and Travelling Steam Cranes of Madras and

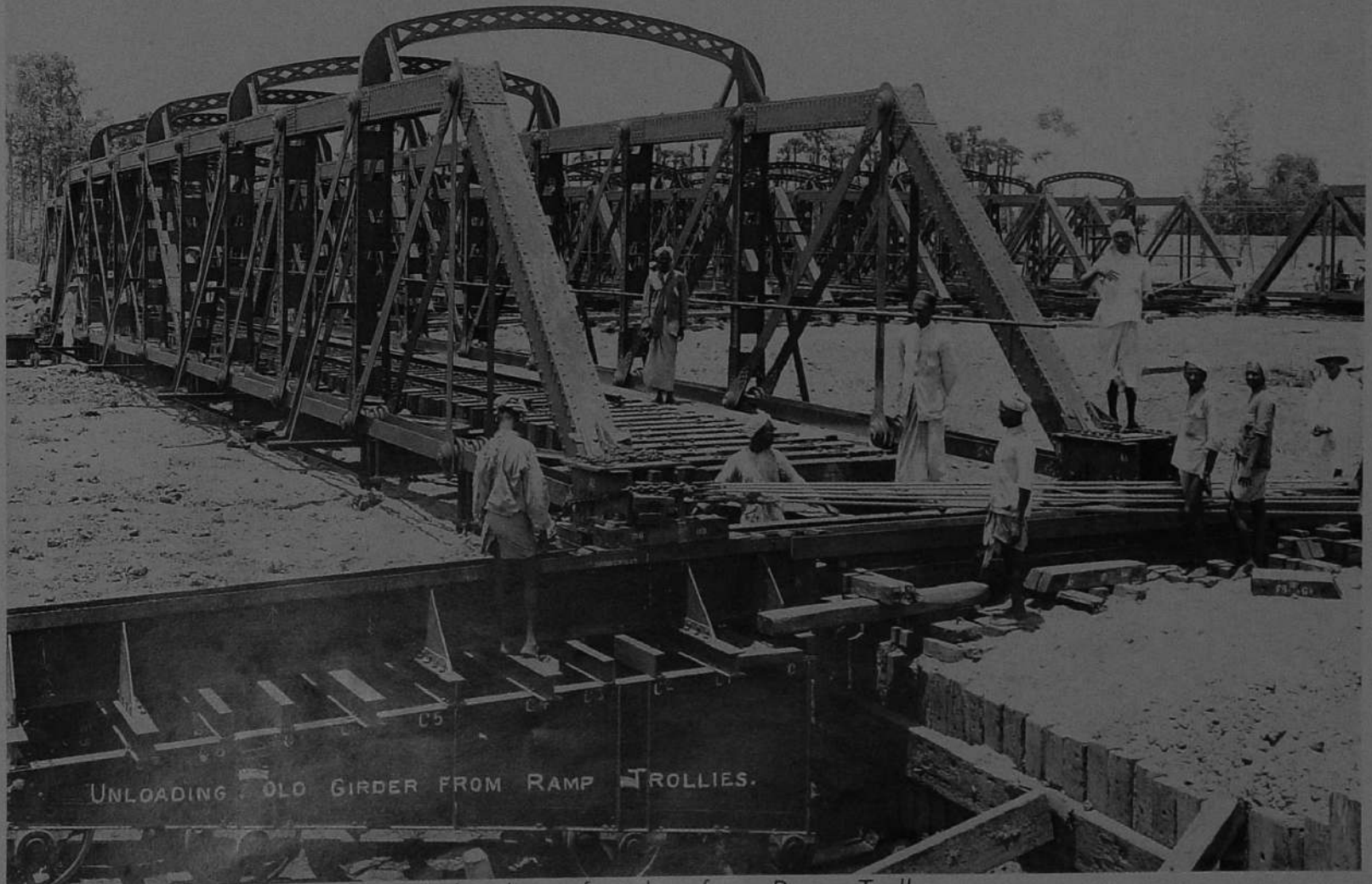
Southern Mahratta Railway. In the heydays of steam traction, this workshop was the premier and most modern workshop among the Indian Railway Workshops overhauling steam locomotives. Consequent upon the phasing out of steam locomotives in the early 80's, this workshop was chosen for undertaking POH of Electric Locomotives of various classes, Diesel Hydraulic Locomotives (shunters) and heavy corrosion repair cum POH of coaches. The workshop also caters to the need of EMU Car Shed, Avadi. Today this workshop has blossomed into an ISO 9002 certified workshop with total commitment to customers. The 'Fairy Queen' the oldest working locomotive anywhere in the world was overhauled by this workshop, in 1998. The total area of this workshop is 22 acres, with covered area of 4 acres and staff strength of 2500.

4. Carriage Works, Perambur

The Carriage and Wagon Workshops, Perambur is the oldest Mechanical Workshops in the Southern Railway system. The erstwhile Madras Railway Company established the workshop in the year 1856 almost simultaneously with the opening of their first line from Royapuram to Walajah Road. Up to 1932, this was the Central Workshop of the then Madras and Southern Mahratta Railway Company. The loco maintenance work was later transferred to Loco Works, Perambur in 1932 about 2 km from the present location. Since then this workshop has been dealing with carriage and wagon POH only. With the creation of Southern Railway in 1951, Carriage works, Perambur became an important part of the system, it is the only BG wagon POH shop in the Southern Railway. In 1956, the Integral Coach Factory came with their shell section and for the next 7 years, till 1963, the Carriage Works was rendering assistance to ICF by furnishing the newly manufactured shells.



Erecting Shop at Golden Rock showing 60 feet wide traverser.
 Note : T 23, a 4-4-0 locomotive built by M/s North British Locomotive Co.,
 Glasgow in 1909 on the traverser



Unloading of girders from Ramp Trolleys



Being close to the mega-coaching depot at Basin Bridge, this workshop provides periodic overhaul to coaches of most of the prestigious trains of Southern India. This workshop has got ISO 9002 certification; it undertakes POH of 175 coaches and POH of 500 wagon units per month with about 6000 employees. The total area of the workshop is 129 acres with a covered area of 22 acres.

5) S&T Workshops, Podanur

South Indian Railway had a small workshop unit set up at Podanur in the beginning of twentieth century. In 1958, the S&T Workshop activities were taken out from Golden Rock Workshops and established at Podanur. This workshop is leader in equipment manufacture for Indian Railways.

Major manufacturing activities are listed below:-

- i) 'Q' series relays
- ii) Token less block instruments
- iii) High thrust point machines
- iv) Double line block instruments.

This workshop situated on a plot of 12 acres, has covered area of 2.6 acres and staff strength of 1000. The annual outturn is about Rs. 25 Crore.

Major events of the workshop are listed below:-

- | | |
|------------|---|
| April 1958 | Mechanical Signalling Repair Shop shifted to Podanur from Tiruchchirappalli. |
| 1963-64 | Manufacture of Signal Control Panels started. |
| 1969-71 | Development of Point Machine and Token-less Block Instrument. |
| 1972 | Manufacture of Shelf Type Relays, technology being transferred from M/s I.T.I. Bangalore. |
| 1973 | Agreement with M/s Westinghouse, London for manufacture of 'Q' Series Relays. |

- | | |
|---------|--|
| 1973-74 | Complete Re-organization and Re-orientation of workshop as a Manufacturing Unit for Modern Electrical Signalling Equipments. |
| 1978 | Axle Counter of Mark I Production Started. |
| 1995-96 | First Production of IRS Type Rotary Lock Point Machine.; First Production and Supplies of Universal Type Axle Counters ; Development of Token less Block Instrument with Q Relays. |
| 1996-97 | Bulk production of Token less Block Instrument with Q series Relays started. |

6. EMU Workshop, Avadi

Broad Gauge EMU (Electric Multiple Units) services were introduced on Southern Railway during 1979. These EMU coaches are being maintained at EMU Workshops, Avadi. The present holding (2002) is 122 Motor Coaches and 295 Trailer Coaches. EMU workshop at Avadi is little different than other car sheds. It also undertakes POH of EMU coaches with the help from the Loco Workshop at Perambur.

7. Mysore, Workshop

The Mysore State Railway was managed for a long time by the erstwhile Southern Mahratta Railway and afterwards by the Madras and Southern Mahratta Railway. These two Railways were maintaining the rolling stock of Mysore State Railways. However, from 1920 onwards, slowly and slowly, Mysore State Railway withdrew from the Madras and Southern Mahratta Railway and started maintenance of its own rolling stock. On the backdrop of these, in 1924, the Mysore Durbar established a Central Workshop at Mysore. Consequent to the transfer of Bangalore-Harihar and Yeshvantpur-Hindupur Sections to the Mysore State Railway, the workshop was expanded to the present form in 1938 with the task of maintaining the MG and NG Rolling stock. With the formation of



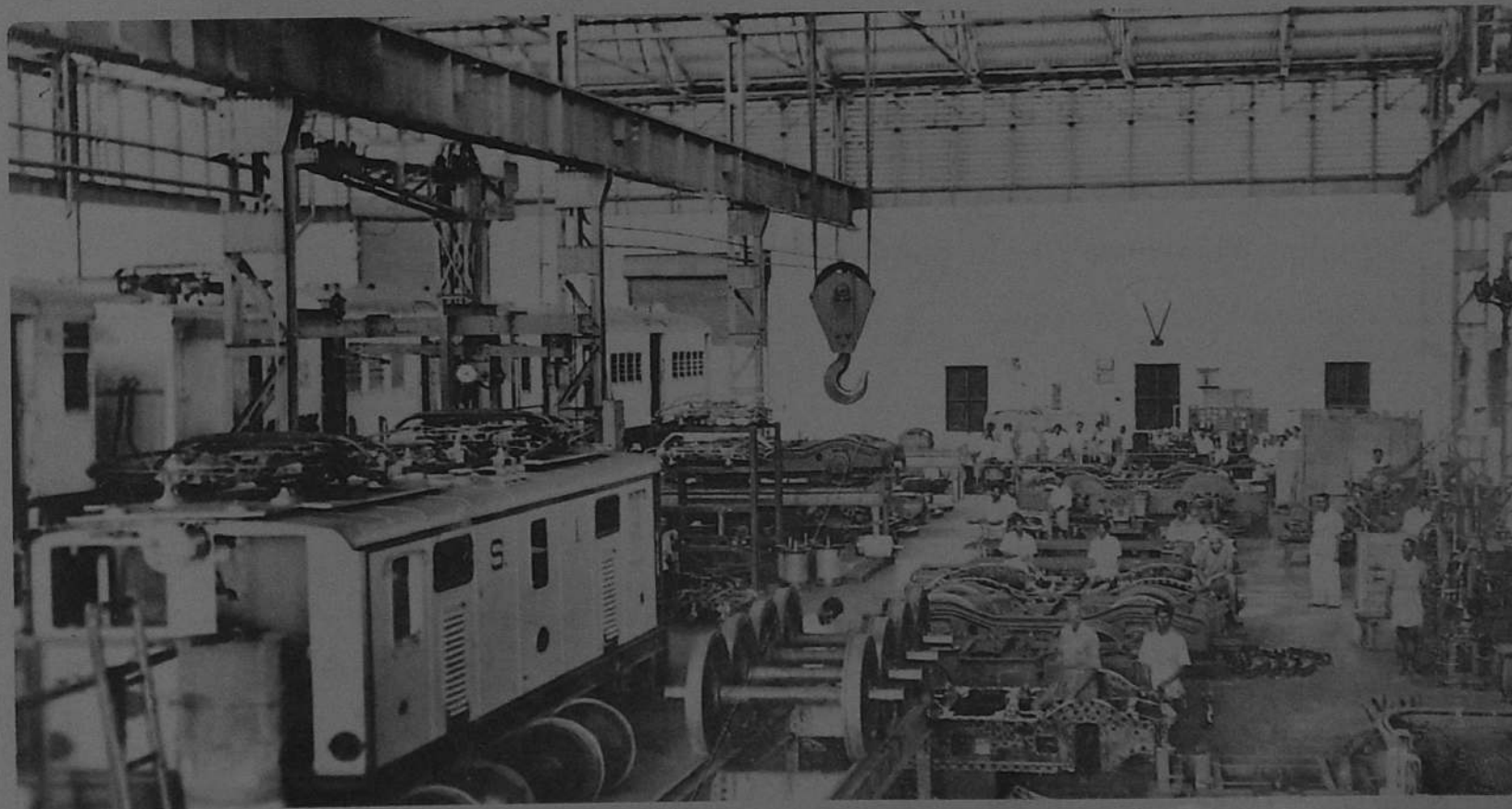
integrated Southern Railway in 1951, this workshop became part of Southern Railway. This workshop used to undertake POH of 8 MG steam locos, 62 MG coaches and 257 MG wagons per month employing 2800 staff. This workshop has the distinction of undertaking MG carriage construction from its very inception. Subsequently in later years construction of NG coaches and NG rail cars was also taken up.

After the conversion of Bangalore-Mysore section into Broad Gauge and progressive dieselisation of the MG sections, MG load declined. A proposal for converting this workshop into BG at a cost of Rs.721.12 lakhs was sanctioned in 1992-93. By July 1994 most of the BG conversion work was completed and the BG coach POH was started inside the workshop from August 1994. The workshop is equipped to undertake POH of BG coaches and meet the requirements of Mysore and Bangalore Divisions. Mysore Shops has got ISO 9002 certification in the year 2000 and in the year 2003, this workshop obtained the coveted ISO

14001 certificate for environment management. During April 2002, this workshop turned out a coach with 'crash worthy and passenger friendly features'. The Hon'ble Minister for Railways adjudged this coach and named as 'Dakshin Ki Rani' as the best coach. From 1st April 2003, this workshop has been transferred to South Western Railway.

8. Loco & EMU Workshop, Tambaram

With the introduction of electric traction on the Metre Gauge section from Chennai Egmore to Tambaram, a workshop was established at Tambaram to undertake maintenance of Metre Gauge EMU stock in 1930. In later years, when Metre Gauge electric traction was extended to Villupuram, a couple of MG locos were also homed at Tambaram. Presently, this workshop undertakes maintenance of 18 MG electric locos; 67 MG EMU motor coaches and 157 MG EMU trailer coaches. One of the earlier MG DC Electric Loco No. YCG-21903 has been preserved at Tambaram.



25. On Going Projects

Railway projects have been a subject of discussion at various levels from the very beginning. Each railway used to publish a document giving history of various projects from time to time. To quote a typical example, the

railway projects actively pursued by South Indian Railway in 1934, as mentioned in their book "Brief History of Railway Projects in the South Indian Railway Area - 1934" are summarized in a tabular form thus:

Sl. No.	Particulars	Gauge & Length in miles	Estimated cost (Rupees in lakhs)
1	Karaikkudi-Melur-Madurai Railway	MG - 51.25	48.5
2	Theni-Periyakulam Railway	MG - 9.92	8.25
3	Theni-Gudalur Railway	MG - 28.53	25.7
4	Bodinayakanur-Gudalur Railway	MG - 28.03	24.1
5	Pollachi-Vannanthurai Railway	MG - 15	10.35
6	Thanjavur-Pattukottai Railway	MG - 28.16	17.3
7	Satyamangalam-Palani Railway	MG - 100	96.0
8	Kollengode - Trichur Railway	MG - 45.58	60.75
9	Tirunelveli - Nagercoil Railway	MG - 31.5	22.8
10	Salem - Tiruchchirappalli Railway	MG - 85	81.5
11	Satyamangalam-Mettupalayam Railway	BG/MG-29.32	35.4 for BG 29.9 for MG
12	Virudunagar-Aruppukottai Railway	MG - 11.87	7.5
13	Arantangi- Karaikkudi Railway	MG - 15.88	16.4
14	Manamadurai-Tuticorin Railway	MG - 69.5	68.6
15	Ariyalur-Jayankondacholapuram Railway	MG - 30	30.0
16	Cuddalore-Pondicherry Light Railway	2 feet gauge- 14.65	12.7
17	Mangalore-Udupi Railway	BG Coastal Route - 40.15 BG Interior Route - 62.45	130.7 149.0
18	Peravur-Makut Railway	MG - 20.12	25.1
19	Satyamangalam-Hardanahalli Railway	MG - 45.37	163.0
20.	Karaikkudi - Devakottai Railway	MG - 9.21	7.6

It was the fashion to call a project of new construction as railway. It is interesting to note that some of the projects have yet to commence

or complete even after 70 years. Things have not changed much.



Southern Railway has a good system of monitoring various projects. The on-going

projects for the year 2003-2004 are described (state wise):

PROJECTS IN TAMIL NADU

Sl. No.	Particulars	Length in km	Cost in crore
NEW LINES			
1	Karur – Salem	85	229.88
	Total		229.88
GAUGE CONVERSION			
2	Cuddalore – Salem	191	198.68
3	Tiruchchirappalli – Nagore – Karaikkal	200	171.61
4	Thanjavur – Villupuram	192	223.00
5	Chennai Beach – Tiruchchirappalli	340	730.02
6	Dindigul – Tiruchchirappalli (93 km)	93	133.93
7	Quilon – Tirunelveli – Tiruchendur & Tenkasi – Virudunagar	357	577.61
8	Villupuram – Katpadi	161	240.00
9	Villupuram – Pondicherry	37	43.83
10	Madurai – Rameswaram	161	240.00
11	Tiruchchirappalli – Manamadurai	150	187.81
	Total		2746.49
DOUBLING			
12	Irugur – Coimbatore	17.70	38.66
13	Attipattu – Korukkupet - 3 rd Line	18	70.56
14	Pattabiram – Tiruvallur fourth line & Tiruvallur-Arakkonam (3 rd line)	15.08	71.94
	Total		181.16
NEW DOUBLING WORKS			
15	Ambatturai – Kodai Road	14.56	22.95
16	Chennai Beach – Korukkupet	4.1	59.58
	Total		
METROPOLITAN TRANSPORT PROJECT			
17	Chennai Beach – Luz (Phase I)	8.97	268.87
18	Tirumylai – Velacherry (Phase II)	11.16	691.85
19	Chennai Beach – Tambaram – Chengalpattu – Gauge Conversion	116	455.24
	Total		1415.96
ELECTRIFICATION			
20	Tambaram – Chengalpattu – Villupuram & Chengalpattu – Arakkonam	197	38.44



PROJECTS IN KERALA

Sl. No.	Particulars	Length in km	Cost in crore
NEW LINES			
1	Angamali – Sabarimala	116	550.00
2	Kottayam – Erumeli	43	200.00
3	Tanur (Kuttipuram) – Guruvayur	36	137.71
	Total		887.71
GAUGE CONVERSION			
4	Quilon – Tirunelveli – Tiruchendur & Tenkasi – Virudhunagar	357	577.61
DOUBLING			
5	Calicut – Mangalore	221	563.08
6	Shoranur – Kuttipuram – Calicut	178.24	178.23
7	Quilon – Trivandrum Central	65	156.63
8	Ernakulam Jn. – Ernakulam yard	3	6.38
9	Ernakulam – Mulanturutti	17.37	35.00
	Total		939.32
NEW DOUBLING WORKS			
10	Mavelikara – Kayankulam	7.89	21.48
11	Cheppad – Kayankulam	7.76	21.48
	Total		42.96
ELECTRIFICATION			
12	Ernakulam – Trivandrum	320	162.03

PROJECTS IN KARNATAKA

Sl. No.	Particulars	Length in km	Cost in crore
NEW LINES			
1	Kottur-Harihar (Via) Harpanahalli	65	124.13
2	Kadur-Chikmagalur-Sakleshpur (Hassan)	93	283.34
3	Hassan-Bangalore (Via) Shravanabelagola	166	412.91
4	Dharmavaram-Penukonda (via) Puttaparthi	53.10	111.26
5	Bangalore-Satyamangalam	260	225.00
	Total	637.1	1156.64
GAUGE CONVERSION			
6	Arsikere-Hassan-Mangalore	236.00	326.00
7	Mysore-Hassan	119.00	186.93
8	Yelahanka-Chikballapur & Kolar-Bangarapet	45.2316.67	57.54
9	Yeshvantpur-Salem	197.00	186.19
10	Bangalore-Hubli/Birur-Shimoga Town/Shimoga Town - Talguppa	469.0063.0098.00	451.92
11	Mysore-Chamarajanagar with extension to Mettupalayam	148.00	175.00
	Total	1391.9	1383.58
DOUBLING			
12	Whitefield-Bangarapet-Kuppam	81.21	137.49
13	Bangalore-Whitefield-Bangalore-Krishnarajapuram (Quadrupling)	13.76	85.00
14	Kengeri-Ramanagaram	32.43	64.53
15	Yeshvantpur-Tumkur	64.00	91.82
	Total	191.4	378.84
ELECTRIFICATION			
16	Bangalore-Kengeri patch doubling with 25 KV Electrification	12.45	28.30

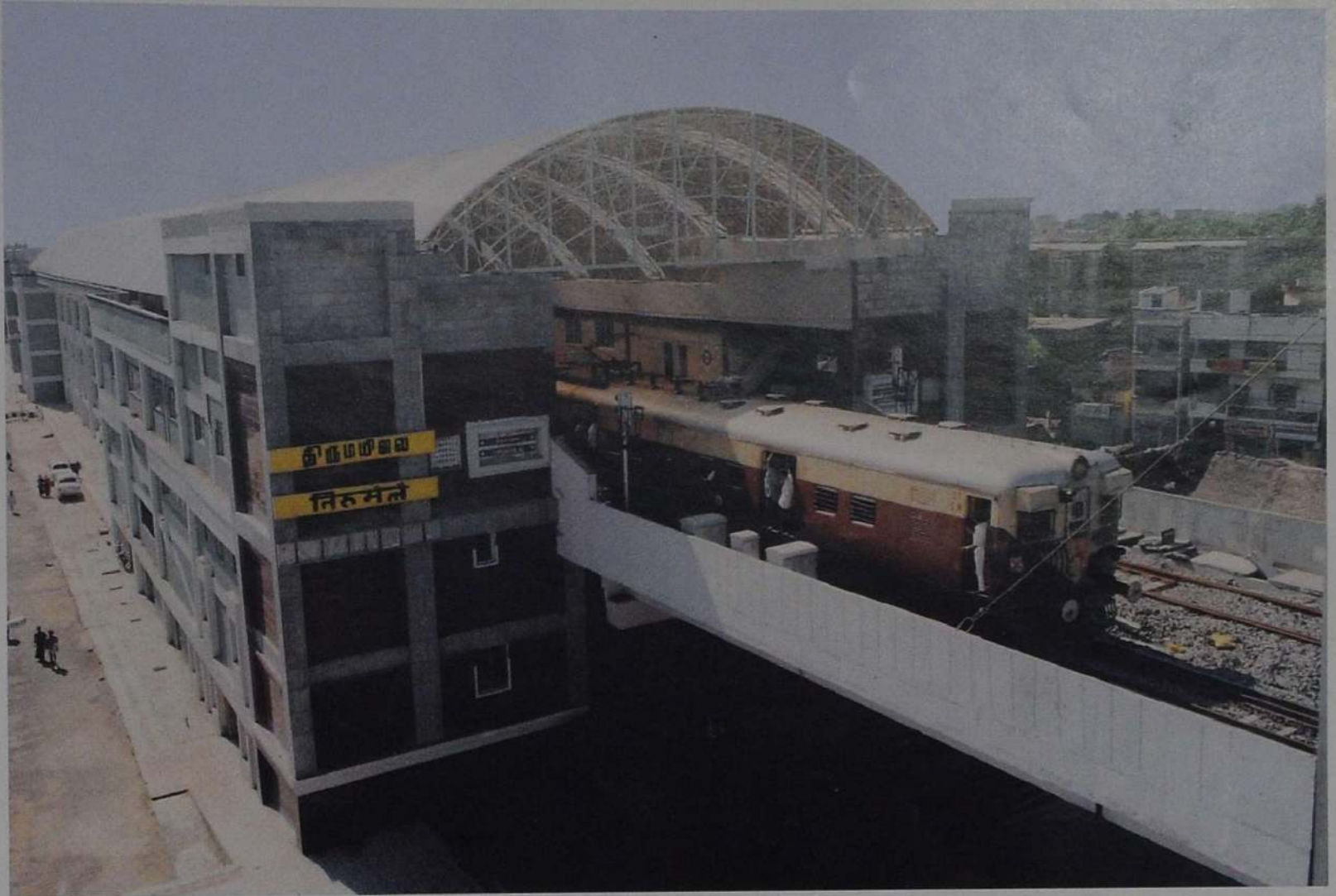


Southern Railway celebrated 150th year of Indian Railways on 16th April 2003. The landmarks of Southern Railway viz., the Chennai Central Station, the Chennai Egmore Station and the Headquarters Office were tastefully decorated and illuminated as photographed above.



The Golden Jubilee of Southern Railway was celebrated with great fanfare. Note the emblem created for the Golden Jubilee by amalgamating the emblems of its constituents viz., Madras & Southern Mahratta Railway depicting the famous Bijapur Tomb, South Indian Railway depicting the elephant and Mysore State Railway depicting the double headed eagle flanked by the prancing yalis (mythical animal with the body of lion and face of an elephant).





Mass Rapid Transit System (MRTS) built beautiful railway stations adopting new building techniques and state of art designs. Note two of its stations, Tirumayilai and Chintadripet in Chennai.



134C



Mangalore Railway Station



Erode Railway Station

134 D



Tiruchchirappalli Railway Station



Trivandrum Railway Station built by the Maharaja of Travancore in 1948.



Rameswaram, the present terminus station. Earlier trains, used to go upto Dhanushkodi



Scherezer Rolling Lift Bridge



Udagamandalam (Ooty) Station and the beautiful garden in the front



Coonoor Railway Station maintains its 1897 look even after 100 years



Mysore Station built by Mysore State Railway



Madurai Railway Station

26. Preserving Southern Railway Heritage

Southern Railway's history dates back to 1852 the year in which Madras Railway Company was registered. During the process of its varied growth, this Railway has passed through many phases, to mention a few; from the era to Company Railway and back to State Management, from steam locomotives to diesel and electric locomotives, from semaphore signals to colour light signals and from conventional track maintenance to mechanized track maintenance. The time-honoured systems are steadily giving way to newer and more expedient ones unwary of the beauty and charm of the old. The change is welcome but the memories of the past do have values and posterity demands not to discard the past that was glorious in its own time and in its own ways.

One often hears the question, "What is the use of preserving it. It belongs to the past". But can there be any future without a past? Our teachings of today are based on the learning from the past and past cannot just be ignored.

Southern Railway, on its formation in 1951 comprised of three major railway systems viz.,

- 1) Madras and Southern Mahratta Railway with its headquarters at Madras. This system was formed by merging Madras Railway Company based at Royapuram, Madras and Southern Mahratta Railway based at Hubli Dharwar.
- 2) South Indian Railway headquartered at Tiruchchirappalli and
- 3) Mysore State Railway headquartered at Mysore.

It was but natural that the heritage items of the erstwhile railways were to be centered on four places viz., Madras (Chennai), Hubli Dharwar, Tiruchchirappalli and Mysore.

Madras (Chennai) the focal point of Madras Railway, Madras and Southern Mahratta Railway and later Southern Railway housed some

of the best edifices of the Railway heritage. The architecture of Madras Egmore station building and of Madras Central station building stand out even after a century's extensive use. In 2002, in the 150th year of Indian Railways, a regional museum has been set up at Perambur near the Integral Coach Factory's furnishing division. This regional museum houses small artefacts as well as full size real life rolling stock exhibits. Hon'ble Minister of Railways, Shri Nitish Kumar, opened this regional museum.

Tiruchchirappalli, the centre of Southern India, played an important role in the development of railways. It was but natural to make it the headquarters of South Indian railway. In 1928, the Central Workshops were shifted from Nagappattinam to Ponmalai (Golden Rock) near Tiruchchirappalli; Golden Rock Workshop's contribution to railway heritage can be seen in various exhibits nurtured by it. These have been tabulated in the later portion of this chapter.

Mysore State Railway had an independent identity and continued to remain so even after its merger into Indian Railways. In 1982, a museum came up there mainly through the efforts of Mr. P.M. Joseph, the Divisional Railway Manager and liberal donations of exhibits from the Maharaja of Mysore. This museum now has a rich collection of smaller artefacts as well as real life rolling stock. The important exhibits have been tabulated in this chapter.

Hubli-Dharwar, the twin cities were the focal point of development of railways in the so-called Deccan. Southern Mahratta Railway chose Hubli-Dharwar as its focal point and built a magnificent building to house its central offices. This building now houses the Arts College at Dharwar. The author of this book was fascinated to see this building, over hundred years old, maintained in its pristine glory. The then Agent's house is now the residence of the Principal. The



new Zonal set-up at Hubli may decide a proper place for keeping historic artefacts of Southern Mahratta Railway and its successors.

Southern Railway is concerned about preserving its rich heritage of the last 150 years. A high level committee has been formed to identify heritage items, to preserve them and also to increase the general awareness of railway persons and their families about the rich heritage. Following steps have been taken to preserve different groups of items:

(i) Photographs and Glass Negatives

The photograph of the bygone era was on glass negative and contact prints would give excellent positive. Such glass negatives (mostly of 7"x9" or 10"x12" size) are rare and form personal collection of individuals. Fresh positive prints taken out from these glass negatives can give excellent photographs and also give authenticity to our heritage. The process of photography is commonly known as "The Wet Plate Process".

Unfortunately, most of the glass negatives of Southern Railway have been lost. We are in the process of collecting available glass negatives

and then preserving it for posterity. A few period photographic albums are with the Public Relations department.

ii) Smaller Exhibits

Smaller exhibits of Southern Railway's heritage are on display at Railway Regional Museum, at Chennai and Mysore. Two working models - one of Nilgiri Mountain Railway and another of 'Scherzer' Bridge are displayed at National Rail Museum, New Delhi.

iii) Railway Records and Archival material

Railway Records and Archival material are stored at three places namely - Perambur, Tiruchchirappalli and Mysore. Steps are being taken to weed out unwanted records and display a few items for appreciation of many a visitors. A new 'heritage room' at the headquarters office at Chennai is on anvil. It will show Madras Railway Company's original records from the earliest times.

iv) Southern Railway Rolling Stock

A number of locomotives of Southern Railway have been preserved at various places. The list of locomotives and other details are tabulated below :

Table 1

LOCOMOTIVES ON DISPLAY (as on 31.03.2003)(Also see tables 4 & 7)

SINo.	Station	Premises where displayed	Loco No.	Class	Type	Maker	Yearbuilt
1.	Coonoor	Station Building	37390	X	0-8-2	SLM	1922
2.	Chennai	General Manager's Office	691	PL	2-6-4T	RS	1903
3.	Chennai	General Manager's Office	4	ZP	4-6-2	Nipp	1954
4.	Delhi	National Rail Museum	11	PT	2-6-4T	RS	1936
5.	Delhi	National Rail Museum	21900	YCG	Bo-Bo	EE	1930
6.	Delhi	National Rail Museum	37302	FMA	0-6-0	Dubs	1888
7.	Golden Rock	Central Workshops	37346	A	0-4-4T	YE	1918
8.	Perambur	Carriage Workshop	700	V	4-4-0	NB	1909
9.	Bangalore	Station Building	698	PL	0-6-4T	KS	1924
10.	Tiruchchirappalli	Divisional Office	NE 4310	YG	2-8-2	Nipp	1956
11.	Tambaram	Car Shed	21903	YCG	Bo-Bo	EE	1930

SLM - Schweizerische Locomotiv-und Maschinenfabrick, Winterthur
 RS - Robert Stephenson & Co. Ltd., Newcastle & Darlington
 Nipp - Nippon Sharyo Seizo Kaisha Ltd., Japan.
 EE - English Electric Co. Ltd. UK

YE - Yorkshire Engine Co., Ltd., Sheffield.
 NB - North British Locomotive Co. Ltd., Glasgow.
 KS - Kerr, Stuart & Co. Ltd., Stoke-on-Trent.
 Dubs - Dubs & Co., Glasgow



WL-15005, a Southern Railway locomotive built by M/s Vulcan Foundry in 1955 is preserved in working order and is used for heritage runs.

A Nilgiri Railway coach for 8 First and 44 Third class passengers, built by M/s Gloucester Railway Carriage and Wagon Company in 1914 is preserved at National Railway Museum, New Delhi.

Table 2

CONDEMNED STEAM LOCOMOTIVES AVAILABLE IN SOUTHERN RAILWAY FOR POSSIBLE FUTURE RENOVATION
(as on 31-3-2003)

S.No.	Individual No.	Class	Type	Year built	Maker
1.	2613	YP	4-6-2	1965	Telco
2.	2723	YP	4-6-2	1967	Telco
3.	4046	YG	2-8-2	1955	Nipp
4.	4126	YG	2-8-2	1956	Lenin
5.	4136	YG	2-8-2	1956	Lenin
6.	4323	YG	2-8-2	1956	Mits
7.	4332	YG	2-8-2	1956	Mits

Telco – Tata Engineering and Locomotive Co. Ltd. Jamshedpur Lenin – Lenin Werke, Pilsen
Nipp – Nippon Sharyo Seizo Kaisha Ltd., Japan Mits – Mitsubishi Heavy Industries Ltd., Japan

V) Southern Railway Architecture

A comprehensive list of Southern Railway Architecture for the purpose of preservation is under preparation. A list of important architecture items proposed for preservation is given below:

Table 3

1	Chennai Egmore Station Building
2	Scherzer Bridge on Pamban Viaduct near Rameswaram
3	NGO Office at Chennai Central (GM's Office)
4	Chennai Central Station Building
5	Tiruchchirappalli Station Building
6	Tiruchchirappalli Divisional Office Building
7	Mysore Station Building
8	Mysore Divisional Office Building
9	Coonoor Railway Station Building
10	Armoury Gate of Golden Rock Workshop
11	Cochin Harbour Terminus Station Building
12	Quilon MG Station Building
13	Divisional Stores Office Building, Quilon
14	Royapuram Station Building
15	Old water tank built on stone masonry at Arakkonam
16	Old loco round house near new Carriage Shed, Madurai



Table 4

EXHIBITS AVAILABLE AT RAIL MUSEUM / MYSORE

Sl. No	Type & Number	Year Built	Tare Weight	Maker	Other details
1.	Brake Van – SR VH 38163	1923	18.5 t	Stable Ford & Co. Ltd., England	Not on wheels
2.	NWR 119, E (2-4-2T) class	1900		W.G. Bagnall Ltd., Stafford, England	Original Name Plaque, Builders No.1625
3.	NG Engine ES – 506 (4-6-2)	1922	56.1 t	Kerr Stuart & Co. Ltd., London	Wooden body, 4 wheels, verandah on one side.
4.	Inspection Car 07330	-	-	-	-
5.	Mysore State Railway NG Coach	1927		Under-frame: Hurst Nelson & Co.,	Body built by Mysore Workshop Last worked between: SBC-BWT in 1958
6.	Inspection Car – MG SR ECS-07327	1901	9 t	Mysore Workshop	Cost: Rs.11.414/-
7.	Hand Crane – MG	1937	3.5 t	Cowans Sheldon & Co. Ltd., Engineers, Carlisle, England.	Wooden beams. Match Truck. Hand operated Cost: Rs.13,274/-
8.	MG Steam Loco YP- 2511(4-6-2)	1952	57 t	North British Loco, U.K.	Roller bearings on Bissell truck and tender
9.	BKH 3402 SCR – MG	1913	-	-	Diamond Bogies. Centre & side discharging wagon.
10.	E Class MG Engine No.37244. (4-4-4 T)	1920	37 t	M/s North British Locomotive Co. Ltd., Atlas Works, Glasgow.	Presented by Visweshwariah Steel Plant, Bhadravati.
11.	MG Locomotive. TS 37338(2-6-2T)	1932	36.2 t	W.G. Bagnall Ltd., U.K.	-
12.	Rail Motor Car.	-	-	Austin Car Co.	-
13.	Steam Fire Engine.	1922	-	Merry Weather, London.	Road vehicle. Copper Vertical Boiler.
14.	Steam Engine Pump			Saxby Farmer.	

Table 5

EXHIBITS KEPT IN SRIRANGA PAVILION, RAIL MUSEUM, MYSORE

Sl. No	Type & Number	Year Built	Tare Weight	Make	Other details
1.	Mysore Maharani's Saloon MG. CR 7342.	1899	22.5 t	Hurst Nelson	Cost:Rs.29,500/-
2.	Working Model of Steam Engine (Double Stroke)	1979	-	Mysore Workshop	-
3.	Dining Car – 7345	1914	-	Burn & Co.	

**Table 6****EXHIBITS PRESERVED AT TIRUCHCHIRAPPALLI**

Sl. No	Item	Year Built	Maker	Other details
1	Armoury Gate Tower Clock	1928	Gillett & Johnston	Bell sound audible for 2 Km
2	Temple Bell at Rockfort	1918	Nagappattinam Workshop, SIR	Donated by SIR to Rockfort temple
3	Hand Rails at Rockfort	1873	HR & Co.	40½ lb. per yard
4	Mercury Barometer	1923	W.H.Bailey & Co. Ltd., Albion Works, Manchester.	Used as Master Gauge
5	Pendulum Wall Clock	1928	W.A. Perry & Co., Birmingham	In working condition
6	Punching / Bending Machine	1900	M/s Henry Berry & Co. Ltd., England	1900-1927 at Nagappattinam. Now at Golden Rock.
7	Wood Planing & Moulding Machine	1923	M/s Thomas Robinson & Sons, England	-
8	Hand travelling crane with match truck	1887	M/s Cowan Sheldon & Co Ltd., Carlisle, England	-
9	Pattern for British Crown	?	Pattern Shop, GOC shops	-
10	Service Book of First Employee of GOC shops	1927	Name - Anugraham	Appointed 21.07.1927. Retd, on 31.5.1967
11	Steam Loco A 37346	1920	Yorkshire Engineering Co. Ltd, Sheffield, England	Withdrawn- 30.04.1965. Available near Armoury Gate.
12	4 Wheeler MG Explosive wagon - C 30178	?	?	Withdrawn - 1931.
13	Temple Bell at Chidambaram	1889	Nagappattinam Workshop.	The bell is in good condition. Occasionally used in the temple.

Table 7**FULL SIZE EXHIBITS PRESERVED AT RAIL MUSEUM, PERAMBUR**

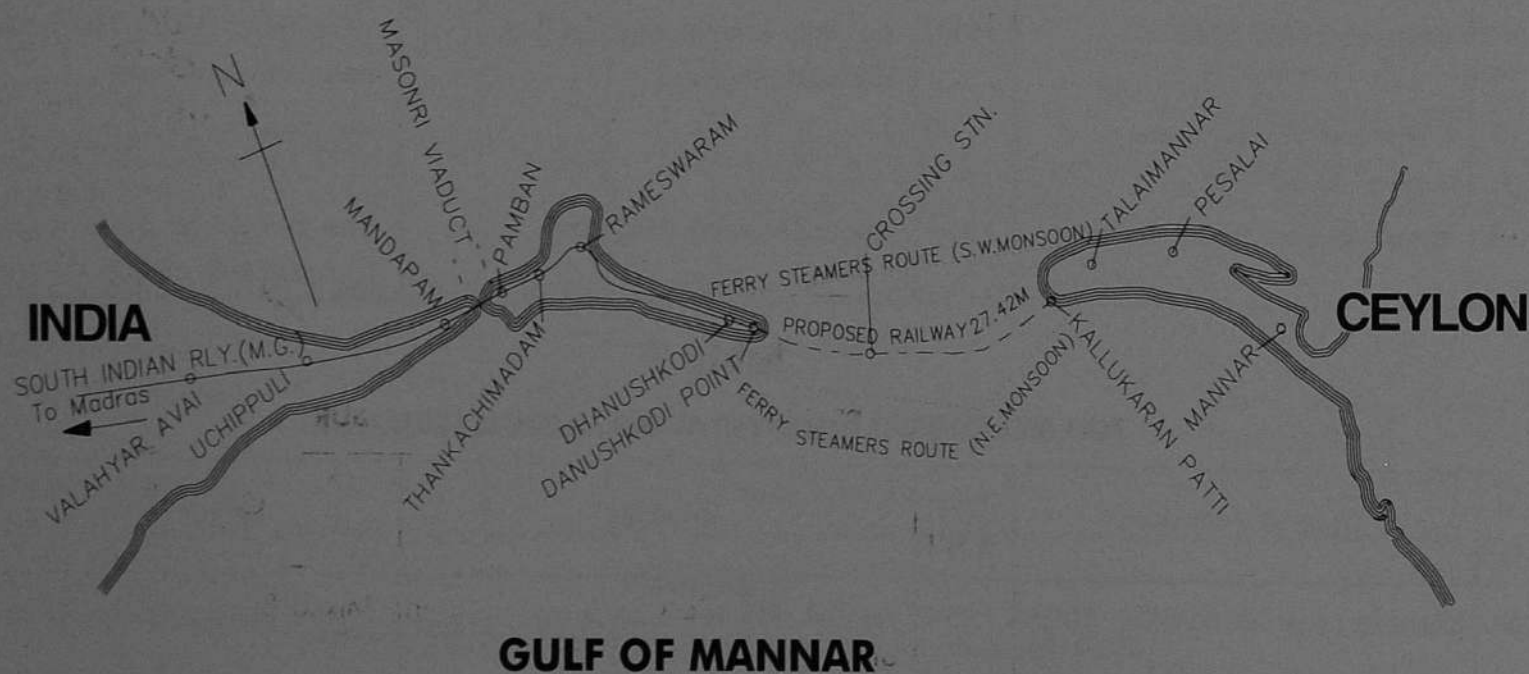
Sl. No.	Type & Number	Year Built	Maker	Other details
1.	Electric Loco No.WCM1 20068	1954	English Electric Company, London and Vulcan Foundry Ltd.	Mixed Service Loco; 2750 KW
2.	Inspection Car RA 30 WR	1921	The Metropolitan Carriage, Wagon and Finance Co. Ltd., Saltley Works, England.	IRS wooden body with steel underframe.
3.	Inspection Car RA 2	1929	Body: Perambur Works.Underframe: Burn & Co., Howrah-	Wooden body with steel underframe.
4.	Fowler ploughing machine	1895	John Fowler & Co., Ltd., Leeds England	Used for agriculture



Table 8

DETAILS OF MODELS AT RAIL MUSEUM, PERAMBUR

Model	Year Built	Model	Year Built
1 Vietnam - Railways Coach-MG	1995	7 Tanzania Rail Coach-MG	1999
2 Executive - Chair Car - BG	1987	8 Palace on Wheels - MG	1996
3 Rajdhani - Chair Car- BG	1982	9 Equipment Inspection Car - BG	1997
4 Air Spring Bogie-BG1998		10 Philippines National Railways Coach	1974
5 Diesel Rail Car -YRD- BG	1973	11 Double Decker Coaches - BG	1977
6 Shatabdi Express Chair Car - BG	1989	12 Shell Model - BG	1991
		13 Rajdhani Express Pantry Car - BG	1982



INDO - CEYLON CONNECTION

27. INDO-CEYLON CONNECTION

According to mythology, Rama when he wished to invade Ceylon to recover his consort Sita, who had been carried away by Ravan, the Demon King of Ceylon, crossed the Pamban Pass from Mandapam on the mainland to the large island on the Indian side and got as far as Dhanushkodi only to find his further progress barred, and—so the story goes—a causeway known as Adam's Bridge came into being, and Rama crossed the sea by this on to Mannar Island and thence to Ceylon, where he recovered his queen.

The possibility of connecting India and Ceylon by a Railway across the bank of sand extending the whole way from Rameswaram to Mannar had been reported on from time to time in the nineteenth century. It picked up momentum later and since 1895 various schemes had been suggested. At the turn of the nineteen-century the scenario could be described thus:

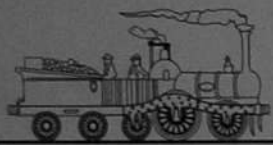
In 1907 Sir Henry Kimber, the Chairman of the South Indian Railway, on one of his visits of inspection to India, received an important deputation from Ceylon planters, who urged that improved means of communication should be provided. On Sir Henry's return to London he secured interviews with Lord Morley, the Secretary of State for India; and Lord Elgin, the Colonial Secretary. As a result of these efforts, the Ceylon Government agreed to construct a railway, of the standard 5 ft. 6 in. gauge, from Madavachi on its main line to Talaimannar on the western side of the island of Mannar, a distance of 67 miles. On Indian side, Madurai-Mandapam Railway was extended across the Pamban Pass by a bridge to the island of Rameswaram and thence to Dhanushkodi.

The South Indian Railway having been extended to Dhanushkodi, the southernmost

point of Rameswaram Island, and the Ceylon Government Railway to Talaimannar, on Mannar Island, two points distant from each other about 21 miles across a narrow and shallow strait, the project was again investigated with the idea of connecting these two terminal stations by a Railway constructed on a solid embankment raised on the sand bank known as "Adam's Bridge," to supersede the ferry steamer service which had been established between these two points.

In 1913, the South Indian Railway Company made a detailed survey and a project was prepared. This project contemplated the construction of a causeway from Dhanushkodi Point on the Indian side to Talaimannar Point on the Ceylon side, a length of 20.05 miles of which 7.19 miles would be on the dry land of the various islands, and 12.86 miles in water. The sections on dry land consisted of low banks of sand pitched with coral and presented no difficulty. The section through the sea was to be carried on a causeway constructed in the following way: A double row of reinforced concrete piles, pitched at 10 feet centre and having their inner faces 14 feet apart, were to be driven into the sand. These piles were to be then braced together longitudinally with light concrete arches and chains and transversely with concrete ties, struts and chains. Behind the piles, slabs of reinforced concrete were to be slipped into position, the bottom slabs being sunk well into the sand of the sea bottom. Lastly, the space enclosed by the slabs was to be filled in with sand.

The top of the concrete work was to be carried to six feet above high water level, and the rails to be laid at that level. The sinking of the piles and slabs was to be done by means of water jets. This causeway was, to cause the suspended sand brought up by the currents, to



settle on either side bringing about rapid accretion and eventually making one big island of Rameswaram island and Mannar Island.

The total cost of the causeway and works at the two terminal points, viz., Dhanushkodi and Talaimannar was estimated to be about Rs. 111 lakhs.

This scheme was given up in favour of a simple one:

At Dhanushkodi and at Talaimannar, two piers were built one on the north side for use during the south-west monsoon, and one on the south side for use during the north-east monsoon. Between these two points a steamer service was provided. This latter, it was originally intended, was to be a train-ferry, whereby the trains were to be conveyed bodily, without transshipment, from Rameswaram to Mannar, and so provide through carriages between India and Ceylon. A modified scheme was, however, agreed upon whereby the sea passage was carried by a new fleet of steamers of the ordinary class.

On 24th February 1914, Indo-Ceylon connection was opened. The opening ceremony was attended by three Governors - of Madras, Ceylon and Pondicherry and a galaxy of dignitaries.

Of all the work on the Indo-Ceylon connection probably the most interesting is the spanning of the Pamban Pass. Commencing from Mandapam, the extension follows for about 2 miles the narrow sandy promontory, on which this place is situated, to its end at Toniturai point, and then across the sea on a viaduct, about $1\frac{1}{4}$ miles long, constructed on the sandstone reef connecting the mainland with the island of Rameswaram. Although a portion of the reef is a wash, yet there is an average 6 or 7 ft. of

water over it. The Pamban Channel is an artificial channel, used by coasting vessels having a draught not exceeding 12 ft. The mean range of the greatest ordinary springs is 2-6 ft. but sea level is affected more by the winds than the tides, and with a high wind in the same direction as a tide there is a 6 to 7 knot current across the reef.

The viaduct is 6,776 ft. long and consists of 145 openings, 143 of 40 ft. span, one of 43 ft. and one of 44 ft. There are 113 spans on the west side and 32 spans on the east side of the Pamban Channel, and the latter is spanned with a two-leaf Scherzer rolling lift bridge. This bridge is 289 ft. between the piers and leaves for vessels a clear way 200 ft. wide and 14 ft. deep. The bridge was designed by the Scherzer Rolling Lift Bridge Company, of Chicago, and has been constructed by Head, Wrightson & Co., Ltd., of Thornaby-on-Tees.

The piers of the viaduct are of granite masonry in cement, with cement concrete foundations enclosed in steel cribs or caissons, the tops of the cribs being fixed at mean sea level. The chief difficulty of the work has been in founding these cribs. Cofferdams, consisting of a double row of sheet piling with clay puddle between, to enclose an area around each foundation, were first tried, were afterwards superseded by a single row of sheet piling, which was merely utilized as a protection to the workmen, and no attempt was made to lower the water outside the steel crib.

These cribs were set by skin divers, who first cleared the loose rock and stone covering the reef within the wooden cofferdams, and made approximately level sufficient of the surface of the reef. The lower edges of the cribs were then packed with concrete outside, the cribs pumped as dry as possible, and any inside



fissures caulked; the bottom was then examined, all loose or soft material excavated, and the crib finally filled with concrete.

Having established this method of carrying out the work and trained the workmen to it, no further difficulty was experienced, but rough seas from time to time caused damage to the cofferdams and subjected the work to interruptions.

With regard to the Scherzer bridge, the abutments each consist of four cylinders, two 12 ft. and two 9 ft. in diameter of steel plate, bolted together in sections and filled with cement concrete. The cylinders have been sunk through the sandstone reef and founded on hard clay about 45 ft. below mean sea level. Sand islands surrounded with piling and coral were formed on the site of each abutment, and the cylinders erected on and sunk through them. The cylinders were sunk partly by dredgers worked by cranes, partly by dress divers, and partly under compressed air. No particular difficulties were experienced.

The piers at Dhanushkodi, which were constructed of screw piles with steel girder superstructure and timber decking, were each 710 ft. long, 26 ft. wide on the approaches, and 34 ft. wide for a length of 300 ft. at the heads. There were two tracks on each pier connecting with the main line, provided with two traversers for traversing carriages or vehicles from one track to the other. The rail and deck level of the piers were 7 ft. 8 in. above mean sea level.

The piles were screwed in by means of steam winches, the sinking being assisted by powerful water jets played round them while being driven. As the piles of each bay were screwed in the girder superstructure, timber decking and tracks were completed, and a crane following up behind on the pier as it is completed lifts and places in position the piles and girders.

For the sea service between Dhanushkodi and Talaimannar three fine steamers, sister ships, had been specially designed. They were built on the Clyde by Messrs. A & J. Inglis from the designs of the late Sir William White, K.C.B, and are named the Curzon, the Elgin and the Hardinge, after the three late Viceroys of India.

The Indo-Ceylon connection was completed in 1914. This gave rise to competition between the South Indian Railway Company and the British India Steam Navigation Company. The main features of an earlier agreement (of 1912 between these two companies) were:

- i) All traffic from stations south of Madurai to Colombo and vice versa would be continued to be routed via Tuticorin. The new route via Dhanushkodi and Talaimannar was to get the traffic from all other stations of the South Indian Railway to Colombo and vice versa.
- ii) Through rates and fares shall be quoted from all stations by both routes.

For facilitating a rail-link to Colombo, the Ceylon Government Railway extended their line to Mannar. This broad gauge extension was known as Mannar Railway. Prior to this connection, most of the traffic was dealt from the port of Tuticorin.

Shri S.C. Ghose in his monograph on India Railway Rates, published by the Government of India in 1918 made an interesting study on the 'War of Rates' amongst South Indian Railway, Ceylon Government Railway and the British India Steam Navigation Company.

Extracts from Shri Ghose's monograph are reproduced below:

"Having made the connection and the Ceylon Government Railway having been



brought into it on the belief that there would be sufficient traffic to pay for the money spent on the portion of the Railway they provided, it is now the question of making the Railways pay having regard to the interests of the public at the same time.

The two Railways are interested in the development of traffic and this being so their interests are allied with the interests of the public.

One Railway holds that the rates are capable of being enhanced whereas the other thinks that this is not so.

The whole question therefore hinges on the issue "what rates the traffic will bear."

It is true that the public had the advantage of low rates via Tuticorin route for a number of years and naturally they would clamour against an enhancement.

The British India Steam Navigation Company have since enhanced their rates from Tuticorin to Colombo and this would show that the rates are capable of enhancement unless of course the position is that the British India Steam Navigation Company do not think it worthwhile to continue this service. A Steamer Company when it finds that a certain service does not pay it, it can take its fleet elsewhere where it will pay, but the Railways are not in the same position.

There are country boats, besides the British India Steam Navigation Company's Steamers, but the inconvenience and risks attendant on transport by such means are great, and generally a more convenient, expeditious and safe route providing regular service can afford to charge a higher rate.

Unless the intention is to shut the Talaimannar route one of the means of settling

the point in dispute would appear to be as follows: -

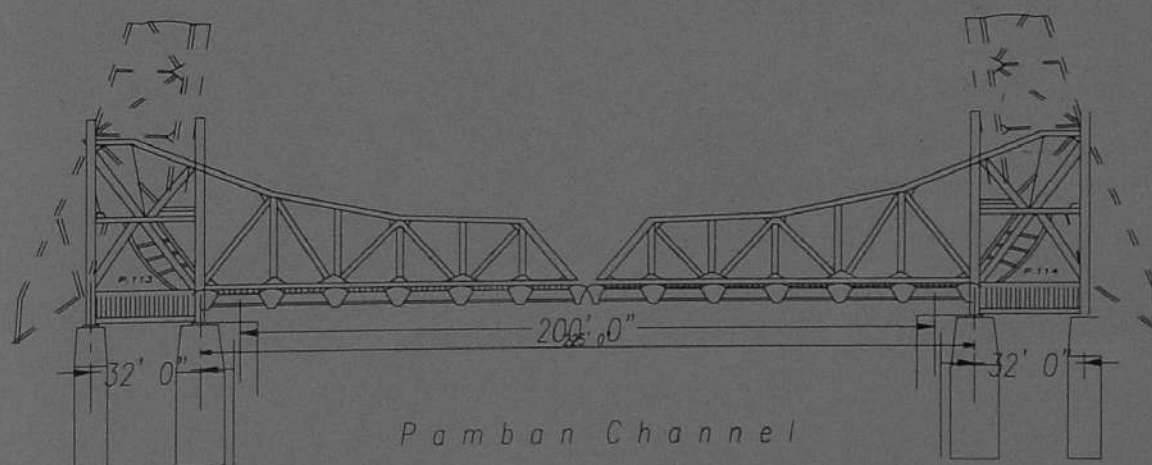
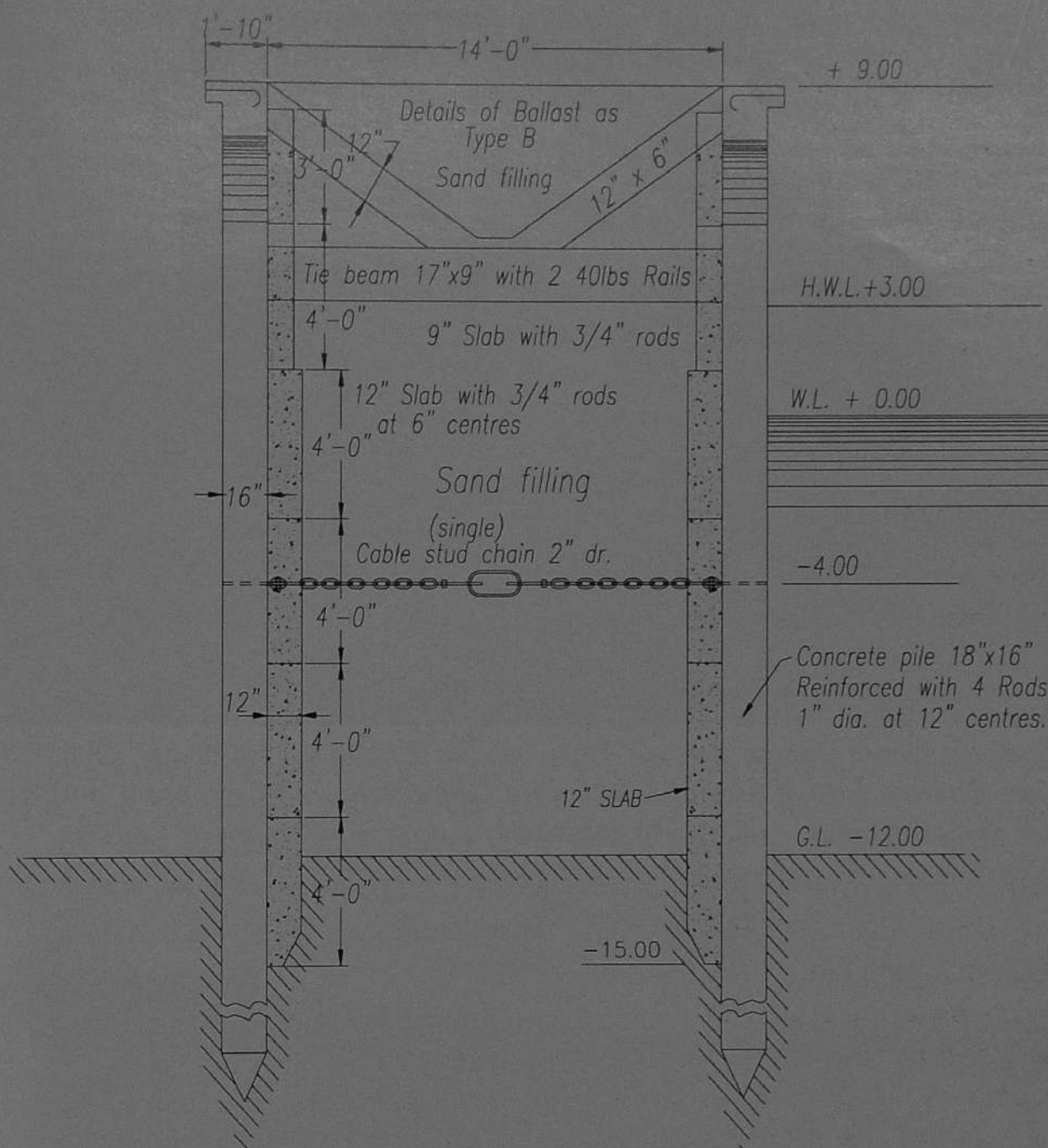
Let the Tuticorin route remain open at the present rates.

Let the Talaimannar route rates (except for traffic from the coasts, for which there is competition and for which low rates must be charged) be fixed on the basis of sum of local rates of the two railways up to Talaimannar.

If it be found, after experience, that this procedure means steady diversion of traffic to the Tuticorin route with a falling off in the traffic via Talaimannar then it can be claimed that the rates by the latter route are such as the traffic cannot bear and then a reduction in the rates must follow, although it is certain that the advantages of the Talaimannar route would command a higher rate than the Tuticorin route, but how much higher only experiment or local enquiries on the spot can prove.

So long as the Tuticorin route remains open at the present rates there cannot be any ground for complaint from the public, except in the matter of rates from stations that are allotted to the Talaimannar route. In fairness to the public if the rates by the Talaimannar route are to be enhanced the rate by the Tuticorin route in respect of such stations, so far as the Railway portion of the journey is concerned, should be the same as they were before the opening of the Talaimannar route".

The Indo-Ceylon connection was open for quite a number of years. The Dhanushkodi station, yard and other facilities were operative all these years. People who travelled to Ceylon on the rail route had many sweet memories. South Indian Railway and later Southern Railway





The Southern Pier at Dhanuskodi, ss 'Elgin' on the left and ss 'Hardinge' on the Right. South Indian Railway had a sizeable 'Marine Department' to maintain and operate its shipping fleet. Alas! no more ships now with Southern Railway



Group photo taken after the Formal Opening of the Indo Ceylon connection, February 24, 1914. The Governor of Madras Presidency flanked by the Governors of Ceylon and Pondicherry.



continued operating 1Up/2Dn Ceylon Boat Mail from Madras to Dhanushkodi Pier, where passengers were transshipped to a turbine ferry steamer for crossing Adam's Bridge for Talaimannar and thence to Colombo. The crossing used to take 1½ hour.

Alas! This rail route is no more now. The author visited Dhanushkodi only to see the telltale signs of the rail-system and abandoned buildings of the then South Indian Railway.

Shri Amit Garg in his article "Journey to Death" published in Southern Railway Women's Welfare Organization in 2002 gave a vivid description of the 1964 tragedy. The same is reproduced below:-

"The six-coach Pamban Dhanushkodi Passenger (No.653) left Pamban at 11.55 p.m. on December 22, 1964 with 110 on board, including a party of school students and five members of the railway staff. The signal at Dhanushkodi Outer went dead and the train stopped for a while. The driver then gave a long whistle and decided to take the risk. A giant 20-foot wave rose from the turbulent sea and smashed the train. Though the initial reports put the casualty figure at 115, based on the number of tickets issued at Pamban, it was suspected that the toll would be around 200 as more passengers were said to have travelled ticket-less on that night.

The tragedy came to light only on December 25 when the Southern Railway issued a bulletin based on the information received from the Marine Superintendent, Mandapam. It said: "The train was caught in the cyclonic storm and was presumably hit by high tidal waves as a result of which the whole train got submerged in water

while entering Dhanushkodi station. Information has been received that a portion of the engine is visible six inches above water." There were reports that huge pieces of the train's wooden carriages had been washed ashore on the Sri Lankan coast.

Another major victim of the cyclone was the Pamban Bridge, built by an Irish engineer exactly 50 years before it was washed away by the tidal waves. The only link between Rameswaram and the mainland, it was 2 km long and had 146 spans. One of the spans had a lifting mechanism to give way to passing ships. As many as 126 girders collapsed. Only 19 girders and the lift span, named after its designer Scherzer, were spared.

The restoration work began immediately. Almost all the girders were salvaged from the sea. "Emergency girders" were brought from as far as Assam. The work completed within three months."

The metre gauge line now has a terminus at Rameswaram. The Scherzer Bridge near Pamban is a very special steel structure. The steel girder bridge opens from the centre, the two arms lifted up from the huge mechanical devices at the two piers. The Scherzer Bridge had been always a special of South Indian Railway and later of Southern Railway. The 1964 cyclone devastated the Rameswaram-Dhanushkodi section and this portion was abandoned. The Scherzer Bridge was also devastated, but to be reconstructed in due course of time.

This metre gauge line is now slated for gauge conversion, perhaps up to Mandapam, the remaining portion viz. Mandapam – Rameswaram may continue to be served by metre gauge trains.



South Indian Railway had a major marine department headed by a Marine Superintendent posted at Dhanushkodi. For the Indo Ceylon connection, they ordered 3 ferry steamers, the first 'CURZON' was launched on October 12, 1912, followed by 'HARDINGE' in January 1913 and the last 'ELGIN' launched on February 26, 1913. To quote from the Railway Gazette of May 9, 1913:

"Messrs. A.J. Inglis Ltd., of Pointhouse Shipyard, Glasgow, are building three turbine steamers for the South Indian Railway Company to carry on a ferry service which the company is about to establish between Dhanushkodi, in the Island of Rameswaram, on the Indian side and Talaimannar in the Island of Mannar, on the Ceylon side.

The vessels have a length overall of 260 ft., a breadth of 38 feet., and depth to promenade deck of 18 ft. 9 in., and a mean load draught of 6 ft., and are built of steel throughout, the registered tonnage being 688 gross, 562 under deck and 278 net. They are about 800 tons load displacement.

They are fitted with 40 ft. top-gallant forecastle and promenade deck extending nearly the whole length, and affording good accommodation for passengers. At each end of the promenade deck is a light sun-deck of teak and amidships a portable awning is fitted. On the promenade deck is placed the chart house with navigating bridge overhead. Under the promenade deck forward of boiler casing a large deck saloon or lounge has been constructed for first-class passengers, with convenient lavatory accommodation, and below

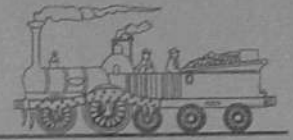
this is the first class dining saloon. Both of these apartments are fitted in teak. The promenade deck above the saloon, sheltered as it is by a light sun-deck and fitted with side screens, will furnish a valuable supplement to the other accommodation for the first-class passengers. The Officers' cabins are situated on the upper deck aft of the first-class deck saloon.

The details of lighting and ventilation have been carefully studied in connection with the locality and climate in which the vessels are to be employed. Electric light has been installed throughout the vessels, and electrically-driven fans assist the ventilation. Suitable provision is made for Indians as well as European first-class passengers; The accommodation for a large number of third-class passengers, who will usually be Indians, is extensive and well arranged. A cabin for their exclusive use is provided on the lower deck aft.

Provision is made for carrying cattle and sheep on the after part of the main deck, and arrangements are made forward on the main deck for the carriage of motor cars.

The watertight sub-division of these steamers has been most carefully worked out. In addition to an unusually large number of transverse watertight bulkheads, all extending to the main deck, the cabin deck for a considerable length forward and aft has been made watertight, forming a double bottom, which will give additional security - an important feature for vessels which are to run at a comparatively high speed over considerable areas of shallow water.

The lifting appliances have been so arranged that motor cars can be lifted on board



by the ship's own derricks and carried on the fore deck. The arrangements for working the cargo from the two holds, placed respectively before and abaft the machinery space, are such as will secure economy as well as quick dispatch.

Powerful electric lights are fitted so that these operations can be proceeded with by night in case of need.

The vessel is propelled by twin screws (outrunning) of 5 ft. diameter and 56 in. pitch, driven by a set of Parson's geared turbines (the first actually made in Scotland) of about 2200 h.p., and one high-pressure and one low-pressure turbine being coupled to each of the two shafts by means of machine cut gears.

The leading condition with regard to speed was that the vessels should start from rest and reach the end of their journey 20 nautical miles distant, in about 72 minutes, instead the journey was completed in 65 minutes during trials."

The Marine Superintendent at Dhanushkodi maintained these ships, he was the local representative of South Indian Railway and his list of duties included the following:-

1. to control all work on the steamers, repairs to engines and machinery; scaling and painting of hull and docking and maintaining the steamers in good order and repair.
2. to periodically examine the boilers of the steamers for Lloyd's Register, certificate, etc.
3. to transfer the running of the steamers to the North or South side as weather conditions may require.

4. to observe the instructions of the General Traffic Manager as to the movement of the steamers for traffic purpose; to nominate the steamers for the particular work required, and the number to be employed.
5. to control the arrangements in connection with the mooring of the vessels at the Piers, and the supply of the necessary staff, including the Pier Master and the mooring staff.
6. to maintain the Buoys and Fenders, as well as maintaining the Piers, decking, and hard railings.
7. to attend to the working and maintenance of the machinery provided on each Pier
8. to observe quarantine regulations and other arrangements, in connection with the running of the steamers, as well as all Port and Health clearances.
9. to control the catering on board the steamers.
10. to supervise the work of the Traffic staff at Dhanushkodi, including the placing and withdrawal of wagons on, and from, the Piers at Dhanushkodi, including the prompt loading and unloading of the vessels.
11. to work generally in co-operation with the Madura Company as Agents of the British India Steam Navigation Company, in the interests of both the South Indian Railway, and the Madura Companies.

The Marine Superintendent had a big establishment. Alas ! no more ships now and no more marine activities on Southern Railway!

28. Glossary And Abbreviations

1. Durbar, or Darbar refers to Government of a Native State.
2. British Government refers to Government of India under British Rule prior to Independence.
3. Gauge, is the distance between the inner faces of the two rails; Broad Gauge (BG): 1676mm (5 ft. 6 inch), Metre Gauge (MG): 1000mm. (3 ft. $\frac{3}{8}$ in.) and Narrow Gauge (NG): 760 mm (2 ft. 6 in.) and 600mm (2 ft).
4. Dates of opening, for any section refer to the official opening date. Usually during construction stage, ballast trains/light engines are worked on the section much before the official date of opening.
5. Bogie Stock is the rolling stock mounted on a pair of (usually) four-wheel bogies pivoted to the curvature of the rails. The rigid wheel base of the rolling stock is thus considerably reduced.
6. Underframe, is the main frame forming the basic structure on which is built the body of a wagon or carriage.
7. Classification of Locomotives, Southern Railway and its predecessors followed British practice in adopting the Whyte Notation, which defines the wheel arrangement and number of wheels in each group, from front to back. The leading and trailing groups are described as carrying wheels, which carry some of the weight and provide guidance; the middle group is the driving wheel, which provides the tractive force. Freight engines, with modest speed and high hauling power, have a higher proportion of driving to carrying wheels than passenger engines, which are designed for faster trains running with lighter loads, Suffix letters denote the manner in which the water and fuel are carried. The absence of a suffix denotes a separate tender. Where the water and fuel are carried on the engine, in tanks and bunkers, the common suffix letters are: -

T: Denoting side tanks on each side of the boiler.

ST: Denoting a saddle tank over the top of the boiler.

Examples:

0-4-2T: An engine with no leading carrying wheels, four driving wheels on two coupled axles, two trailing wheels and water carried in side tanks.

2-8-2: A freight or mixed-traffic engine with two leading carrying wheels, eight driving wheels on four coupled axles and two trailing carrying wheels, water and fuel in a separate tender.

Co-Co means a locomotive with two bogies, each bogie containing 3 driving or powered axles. Most of the present fleet of diesel and electric locos are Co-Co

Bo-Bo means a locomotive with two bogies, each bogie containing 2 driving or powered axles.
8. Dates, when referred to locomotives manufacture year, means the ex-works year and not necessarily the 'on line' year.
9. Name and Insignia, worn by a locomotive were not rigidly adhered. They were more for decorations.
10. Locomotives and Carriages, continued to have their old numbers, till the 1957-58 all India renumbering scheme was introduced.
11. A lakh means 100,000. A crore is equal to 100 lakhs.



12. Abbreviations used for railways are listed herewith:-

EIR	East Indian Railway
GIP	Great Indian Peninsular Railway
SIR	South Indian Railway
MR	Madras Railway
SMR	Southern Mahratta Railway
MSM	Madras and Southern Mahratta Railway
SR	Southern Railway
NMR	Nilgiri Mountain Railway

SWR	South Western Railway
MSR	Mysore State Railway
WIPR	West of India Portugese Railway
BNR	Bengal Nagpur Railway
BB&CIR	Bombay Baroda and Central India Railway
RMR	Rajputana Malwa Railway

13. CW (in) denotes coupled wheels, diameter in inches.
cyls (in) denote two cylinders, diameter x stroke in inches.

14. The spellings of tours, railway stations etc., used in this book are the current ones, as mentioned in Railway Timetable of 2003.



THE
COCHIN GOVERNMENT GAZETTE.
EXTRAORDINARY.

PUBLISHED BY AUTHORITY.

ERNAKULAM :—*Tuesday*, ^{Kanni 11, 1081.}
_{September 26, 1905.}

HIS EXCELLENCY the Right Honourable Arthur Oliver Villiers, *Baron Ampthill*, G. C. S. I., G. C. I. E., Governor of Madras, arrives at Chalakudi by Special Train at 10-30 A.M. on Tuesday, the ^{11th Kanni 1081}
_{26th September 1905}, and proceeds after breakfast to Wellikolangari and thence to Thoppathikamalai after lunch. Halting there for the night His Excellency leaves for Orukombankutty the next morning for breakfast, and reaches Parambikolam in the evening. His Excellency will make a stay of four days there shooting in the State Forests, after which he will return to Chalakudi for breakfast on the morning of Tuesday the ^{18th Kanni}
_{3rd October}. There will be a State Luncheon at 2 P.M. on the same day, and at 3 P.M. His Excellency will, at the request of His Highness the Raja, perform the ceremony of opening the Cochin Forest Tramway. At 6 P.M. His Excellency leaves Chalakudi for Shoranur by Special Train. The arrival on the ^{11th Kanni}
_{26th September} is private. The departure on the ^{18th Kanni}
_{3rd October} is public, on which occasion all officers of the State who are on the Darbar list are requested to be present.

Tuesday, the ^{18th Kanni}
_{3rd October}, will be a public holiday throughout the State in honour of the occasion.

Office of the Diwan of Cochin
Camp—Chalakudi.

^{10th Kanni 1081.}
_{25th September 1905.}

By Order,
C. ACHYUTA MENON,
Secretary to the Diwan.

The Cochin Government Gazette Extraordinary which was issued at the time of the opening of the Cochin Forest Tramway,

ANNEXURE I

The Cochin Forest State Railway

This forest line was probably the biggest and best-equipped tramway designed for purely forest work in the world, having features of special interest to engineers and common men alike. Edward Harran narrated it in his book, 'The Ways of Our Light Railways' published in 1910 based on the information supplied by the Diwan of Cochin State. Extracts from it:

"A line of tramway on the metre gauge runs through a portion of the State of Cochin in South India, the forests of Cochin form one of the most valuable assets of the State, their total approximate area being 505 square miles or nearly one half of its entire extent. Their commercial importance was, it is stated, vaguely realized as far back as the beginning of Nineteenth century, but the earlier attempts to work them were of the usual spasmodic and unsystematic nature.

Mr. Alwar Chetty assumed charge of the administration of the Cochin Forests in April 1899, and his first care was to set a period of rest for the overworked area of timber and to set about securing a suitable outlet for the prospective output of the then virgin forests. In 1900, at the suggestion of Mr. Alwar Chetty, Mr. Hadfield was appointed to co-operate with him as special Forest Engineer, and the preliminary work of these two Officers consisted in surveying the Chalakudi River with the object of ascertaining the practicability of utilizing these waters to float down cut timber from the interior. It was found, however, that the higher reaches of the river were so full of obstructions that the cost of training them for this purpose would be prohibitive, while, in any case, the river could only be used for the transport of timber for about four months in the year. On the other hand, the

inspection disclosed the fact that a land route, should tap a far richer forest area than the river alone did, while, of course, it would be open all the year round. So it came about that the idea of a tramway in three sections arose and was recommended to and sanctioned by the Durbar. The first section was to cover a distance of 8 miles in the valley to be followed by a self-acting inclined tramway 5,000 feet long. The second section, $4\frac{1}{2}$ miles long, was to be followed by a slide 7,000 feet long, whence the third section, also $4\frac{1}{2}$ miles long, was to extend to the Kurumali River, from which point timber could be floated to the railway station at Trichur during the monsoon period and carted to the Chalakudi Station in the dry weather. According to this first propounded scheme, timber from the hitherto unworked Parambikulam Forest was to have been floated by the Parambikulam River to the Tramway Terminus in the valley. A visit paid by His Highness the Maharaja of Cochin to the Parambikolam and Nelliampatty Forests in October 1903 suggested a revision of this scheme, the revision providing for the extension of the proposed tramway to Parambikolam, an additional $12\frac{1}{2}$ miles, the experience gained during the preceding year or two having shown conclusively that the Parambikolam River could not be relied upon to carry every year anything like a year's full yield of timber. Mr. Haldwell, a specially engaged engineer, made a survey of this extension in 1904.

Today the total length of the line is $49\frac{1}{2}$ miles (56 miles including sidings) divided into three sections. The first section extends from mile, 1 to 21, the second from mile $22\frac{1}{2}$ to 27 and the third from mile 28 to $49\frac{1}{2}$. The first and second sections are connected by a self-acting wire rope manipulated double-way of $1\frac{1}{2}$ miles, whilst the second and third sections are similarly connected by another incline of a mile in length.



The rails utilized between miles 0 to 10 are 28lb flat-footed steel rails, and between 10 and 49½ miles, 21½lb; in both cases they are laid on sleepers of Teak, Irul, Koramaruthu or Pongu woods of 6 feet by 7 inches by 4½ inches dimensions spaced two feet apart centre to centre, the rails being fixed to the sleepers by means of ordinary dog spikes, chairs or tie-plates not being used. The gauge is metre; the average gradient of the line 1 in 80 and the maximum gradient 1 in 2.5, which gradient occurs on the third of the five inclines which have been embodied in the construction.

The line starts from Chalakudi Station (on Shoranur - Cochin Railway) and runs almost due east to the head of the Parambikolam Valley. From Chalakudi to the 9th mile no gradient exceeds the ruling grade. Between 9 and 10 miles there are two reversing stations, thence the line runs along the Muppli Valley as far as the 19th mile after which there are four reversing stations leading up to the foot of the first incline. The line then rises by three successive inclines and crosses the Pandimudi Ridge, about 1,500 feet below the summit, which is 3,626 feet above sea level. Consequently at this point the height of the rails above sea level is some 2,126 feet. The line then descends by twelve reversing stations to Kothermuzhi, 25 miles, and thence along a slightly rising gradient to Pothupara, 26½ miles, from which it rises by means of two inclines to Komalapara, about 2,500 feet above sea level. It then descends by five reversing stations to Myladappen and again by three more to Mudurachal, 32 miles, from which station it runs along the Karappara River Valley as far as 36½ miles, crosses the Kuriarputti River at 41 miles and continues along the Parambikolam river up to the terminus of the line, which is 2,700

feet above sea level. A number of necessary sidings are provided en route to facilitate loading of the various species of timber adjacent to the depots wherein these are collected after the trees have been felled. The second section of the line, 22 to 27 miles, runs along a deep valley either side of which is bounded by lofty ridges, which it crosses by means of the reversing stations and two of the inclines already alluded to. There are nineteen reversing stations in all, ten in the second and nine in the third section and five self-acting inclines. These inclines merit a special description being given of them, as they are practically singular of their kind in India.

The incline-ways referred to are so constructed as to be self-acting, and three of them are situated in series between 21 and 23 miles and the other two between 26½ and 28⅞ miles. They are worked by means of wire cables controlled from brake-houses by gear independent of each other and consisting of horizontal wheels round which the cables pass two or three times. The inclines are double railed with suitable crossover points at the up hillside brake house. The points are so arranged that a descending load, which travels down by force of gravity, require no up hill shunting - practically the locomotive places the truck, which, on being uncoupled, is then ready for the descent. In some cases, however, empty trucks going up have to be hand shunted after being placed in order to place them on the side of the upper incline on which the traction rope lies. The ropes are flexible and are of 1⅛ inch plough steel wire. The cable passes over a grooved pulley 6 feet diameter after which it forms a figure of 8 over a loose pulley, back again over another 6 feet pulley mounted on the same shaft as the first and thence to the other line. On the vertical



shaft on which these two pulleys are, and on which the rope binds, are mounted two horizontal drum pulleys each 6 feet diameter, $3\frac{1}{2}$ inches broad with $\frac{1}{4}$ inch flanges. Steel hand brakes $\frac{3}{16}$ inch thick and 3 inches broad, studded with hardwood brake blocks 6 inches long, can be applied to these drums by powerful linked levers controlled by hand wheels and screws to control the speed of the load descending the incline. The grooved pulleys round, which the rope binds, are filled in with leather sections on end-grain to give a good grip. The cast iron portion of these wheels is suitably dovetailed out to contain the leather packing.

The first, second and fourth of the five incline ways are on curves, round which curves the wire are guided by vertical rollers. On the straight portion of the inclines horizontal rollers placed 30 feet apart support the cable. The incline ways were erected by the firm of Messrs. Orenstein and Koppel (now Messrs. Orenstein and Arthur Koppel), Light Railway Engineers, etc., of Berlin and Calcutta, who also supplied the locomotive stock. The same firm supplied the rails, points, crossings, etc., as also the rolling stock. The rolling stock of the Cochin Forest Railway consists solely of open bogie trucks, specially designed for carrying timber, with swiveled bolsters and chilled cast-iron wheels, each bogie having a carrying capacity of 12 tons. The use of the chilled cast iron wheels is worthy of passing mention in view of the fact that at the present time their economy or otherwise is a matter of some controversy among railway administrations, the opinion being largely held that the longer initial life of the chilled surface does not compensate for the greater difficulty and expense subsequently attendant on grinding it up. It would, therefore, be interesting to know the opinion of the mechanical authority of the

Cochin Tramway with regard to them and to hear how they have worn under the stock of that line.

The locomotives of the line, which are generally of one type, are designed to pull or push a gross load of thirty tons on a gradient of 1 in 50 or eighteen tons gross on a gradient of 1 in 25. They are built for an ordinary working boiler pressure of 205 lbs. per square inch (which will be recognised as well above the ordinary especially where metre gauge or light line engines are concerned) and are fitted with the Orenstein and Koppel patent valve motion, the leading feature in the whole design being a combination of maximum effectiveness with a minimum of simplicity in construction and mechanical motion generally.

The total expenditure debited in the accounts of the State against the Tramway up to the end of August 1907 was Rs.15,15,709, while the debited expenditure for the year 1st September 1907 to 31st August 1908 for both construction and maintenance was Rs.5,02,016, the grand total of expenditure down to the end of August 1908, therefore, being Rs.20,17,725. This sum includes maintenance charges, cost of rolling stock, etc., etc., but not the value of timber supplied from the forests for construction, an item for which no account is given.

The annual cost of maintaining the line, rolling stock, locomotives, etc., etc., is estimated at Rs.1,20,000.

The total area of virgin forestland owned by the Cochin State is about 217 square miles, of which 127 miles are tapped by the Tramway. The balance of 90 square miles, comprised mostly by the Sholayer and adjacent valleys, is not yet connected with the outer world by any means of cheap, easy or quick communication".

Annexure II

Dates of Opening

(Reproduced from History of Indian Railways published from time to time)

Erstwhile Madras and Southern Mahratta Railway (Broad Gauge)

Sections of Railway	Date of opening	km	Total
SOUTH WEST LINE —			
Main line —			
Madras to Veysarpadi	07.04.1873	03.48	
Veysarpadi to Walajah Road (Arcot)	01.07.1856	101.74	
Walajah Road (Arcot) to Katpadi	07.05.1857	24.08	
Katpadi to Gudiyattam	19.05.1858	24.72	
Gudiyattam to Ambur	16.01.1860	27.37	
Ambur to Vaniyambadi	01.02.1860	16.06	
Vaniyambadi to Jolarpettai	23.05.1860	17.32	214.77
Bangalore Branch —			
Jolarpettai Junction to Bangalore	01.08.1864	135.78	
Cantonment			
Bangalore Cantonment to Bangalore City	01.07.1882	4.91	140.69
Branches —			
Royapuram Branch —	01.07.1856	3.48	
Veysarpadi to Royapuram	22.01.1900	1.65	
Royapuram to Beach	15.03.1907	1.63	
Washermenpet to Basin Bridge	16.02.1931	1.80	8.56
Walajah Road (Arcot) to Ranipet	17.04.1899	6.71	
NORTH-WEST LINE			
Arakkonam to Nagari	04.03.1861	27.79	
Nagari to Puttur	08.12.1861	15.43	
Puttur to Renigunta	15.09.1862	23.27	
Renigunta to Reddipalle	01.10.1864	61.19	
Reddipalle to Cuddapah	01.09.1865	63.72	
Cuddapah to Muddanuru	01.08.1866	55.22	
Muddanuru to Tadpatri	01.09.1868	51.61	
Tadpatri to Gooty	01.08.1869	47.83	
Gooty to the Tungabhadra River	12.12.1870	121.23	
Tungabhadra to Raichur	15.03.1871	28.84	496.13
NORTH EAST LINE -			
Basin Bridge to Korukkupet	15.03.1907	1.71	
Washermenpet to Ennore	22.02.1896	14.11	
Ennore to Gudur	23.02.1899	121.10	
Gudur to Nellore (Metre Gauge)	01.11.1888*	38.22	
(Converted to Broad Gauge)	01.11.1899		
Nellore to Krishna Canal	20.12.1893	249.45	
Bezwada to Kovvur	15.07.1897	5.63	
Kovvur to Rajahmundry	06.08.1900	7.55	
Rajahmundry to Korrapalam	15.07.1893	190.66	770.44
Branches —			
Samalkot Junction to Kakinada Port Branch	15.07.1893	15.69	15.69
Guntur to Tenali	18.03.1916	25.23	25.23
Nidavavolu-Narasapur	03.02.1929	75.52	75.52
Bowringpet to Marikuppam (Kolar Gold field)	01.06.1894	15.92	15.92
Grand Total			1769.64

Erstwhile Madras and Southern Mahratta Railway (Metre Gauge)

Sections of Railway	Date of opening	km	Total
Main line			
Frontier to Castle Rock	03.02.1888	5.83	
Castle Rock to Deuli	15.06.1887	4.43	
Deuli to Dharwar	24.01.1887	90.12	
Dharwar to Hospet	01.07.1885	162.98	
Hospet to Bellary	24.03.1884	65.20	
Bellary to Guntakal	16.05.1887	48.44	
Guntakal to Nandyal	11.07.1887	146.11	
Nandyal to Cumbum	15.06.1890	101.68	
Cumbum to Tadepalli	03.10.1889	197.00	
Tadepalli to Bezwada		4.79	826.58
Harihar branch -			
Hubli to Harihar	18.10.1886	130.02	130.02
Bijapur branch -			
Gadag to Hotgi	01.08.1884	278.54	
Hotgi to Sholapur	15.05.1927	14.89	293.43
Poona branch			
Londa to Belgaum	21.03.1887	51.18	
Belgaum to Miraj	22.12.1887	138.21	
Miraj to Koregaon	02.05.1887	122.31	
Koregaon to Ghorpuri	18.11.1886	133.69	
Ghorpuri to Poona	04.10.1890	1.46	446.85
Guntakal Mysore Frontier branch			
Guntakal to Dharamavaram	01.03.1892	101.63	
Dharamavaram to Hindupur	23.04.1893	79.31	
Hindupur to Mysore Frontier	17.07.1893	11.70	192.64
Bellary-Rayadurg branch-			
Bellary to Rayadurg	01.07.1905	53.67	53.67
Hospet Kottur branch-			
Hospet to Kottur	01.04.1905	69.46	
Gunda Road to Nagalapuram	01.12.1906	5.52	
Nagalapuram to Ramgad	24.05.1909	4.57	
Ramgad to Yeshvantnagar	01.10.1910	10.93	
Yeshvantnagar to Samehalli	03.03.1928	18.89	109.37
Guntur Macherla Branch-			
Guntur to Macherla	15.01.1930	128.47	128.47
Bezwada Masulipatam branch			
Bezwada to Masulipatam	04.02.1908	79.61	
Masulipatam to Masulipatam Port (Tidal lock)	01.01.1909	3.75	83.36
Gudivada Bhimavaram Branch-			
Gudivada to Bhimavaram	17.09.1928	65.34	65.34
Katpadi Dharmavaram Branch-			
Katpadi to Pakala	18.03.1891	63.54	
Pakala to Vayalopad	01.01.1892	75.14	
Vayalopad to Dharmavaram	20.03.1892	151.50	290.18



Erstwhile Madras and Southern Mahratta Railway (MG)-Coold.

Sections of Railway	Date of opening	km	Total
Pakala Gudur Branch-			
Pakala to Tirupati West	18.03.1891	40.31	
Tirupati West to Gudur	15.09.1887	95.04	135.35
Dronachellam Karnool Railway- (at Dronachellam)	01.01.1909	0.14	0.14
Kolhapur State Railway			
Kolhapur to Miraj	21.04.1891	47.11	47.11
Sangli State Railway			
Miraj Junction to Sangli	01.04.1907	7.89	7.89
Grand Total			2810.40

Erstwhile Mysore State Railway (Metre Gauge)

Sections of Railway	Date of opening	km	Total
Bangalore Extension			
Mysore to Mandya	25.02.1882	44.98	
Mandya to Channapatna	20.03.1881	37.51	
Channapatna Bangalore	01.02.1881	55.92	138.41
Nanjangud Extension-			
Mysore to Nanjangud	01.12.1891	24.29	
Nanjangud to Nanjangud Town	12.07.1899	1.22	25.51
Arsikere Extension -			
Mysore to Arsikere	03.01.1918	165.68	165.68
Birur-Shimoga Section-			
Birur to Shimoga	01.12.1899	60.74	60.74
Chikajajur to Chitaldrug Section			
Chikajajur to Chitaldrug	05.01.1921	33.64	33.64
*Bangalore -Harihar Section			
Bangalore-Tumkur	11.08.1884	68.77	
Tumkur-Gubbi	26.12.1884	17.70	
Gubbi-Birur	12.08.1889	123.23	
Birur-Harihar	21.02.1889	129.05	338.75
Hindupur (Yesvantpur-Mysore Frontier) Section			
Yesvantpur -Dodballapur	15.12.1892	32.51	
Dodballapur-Mysore Frontier	17.09.1893	49.87	82.38
Nanjangud -Chamarajanagar Section-			
Nanjangud to Chamarajanagar	27.08.1926	35.87	35.87
Shimoga Talguppa Extension			
Shimoga to Shimoga Town	31.01.1929	2.16	
Shimoga Town to Ragihosahalli	12.04.1930	28.36	
Ragihosahalli to Arasalu	25.05.1931	12.33	
Arasalu to Anandapuram	30.04.1934	15.43	
Anandapuram to Sagara	11.03.1938	26.28	
Sagara to Talguppa	10.11.1940	15.30	99.86
Grand Total			981.76

Erstwhile South Indian Railway (Broad Gauge)

Sections of Railway	Date of opening	Km	Total
Main line			
West outer signal at Jolarpettai to Tirupattur	23.05.1860	7.48	
Tirupattur to Salem	01.02.1861	112.62	
Salem to Sankaridurg	01.12.1861	38.12	
Sankaridurg to Podanur	12.05.1862	114.65	
Podanur to Pattambi	14.04.1862	104.54	
Pattambi to Kuttipuram	23.09.1861	18.54	
Kuttipuram to Tirur	01.05.1861	15.11	
Tirur to Beypore (Calicut)	12.03.1861	26.25	
Kadalundi to Beypore (Calicut)	02.01.1888	14.82	
Calicut to Badagara	01.10.1901	46.59	
Badagara to Tellichery	01.05.1902	21.73	
Tellichery to Cannanore	20.05.1903	20.92	
Cannanore to Azhikkal	15.03.1904	6.60	
Azhikkal to Kanhangad	21.08.1906	55.56	
Kanhangad to Kasaragode	01.10.1906	22.88	
Kasaragode to Kumbala	17.11.1906	12.26	
Kumbala to Mangalore	03.07.1907	33.65	
Short link near Shoranur	12.11.1942	0.81	673.13
Mettupalayam branch-			
Podanur to Coimbatore Jn.	01.02.1873	6.05	
Coimbatore Jn. to Mettupalayam	31.08.1873	35.36	
Vellalore Road to Nanjundapuram	01.10.1939	1.59	43.03
Palghat Olavakkot Section			
Olavakkot to Palghat	02.01.1888	3.86	3.86
Nilambur Branch-			
Shoranur to Angadipuram	03.02.1927	27.99	
Angadipuram to Vaniyambalam	03.08.1927	27.46	
Vaniyambalam to Nilambur Road	20.10.1927	11.14	
Salem to Mettur Dam Branch	15.04.1929	37.32	37.32
Tiruchchirappalli-Erode Section-			
Tiruchchirappalli Jn. to Tiruchchirappalli Fort	11.03.1862	4.35	
Tiruchchirappalli Fort to Karur	03.12.1866	71.78	
Karur to Kodumudi	01.07.1867	27.10	
Kodumudi to Erode	01.01.1868	37.69	140.92
Through Goods line near Tiruchchirappalli	01.04.1931	1.67	1.67
Shoranur to Ernakulam	16.07.1920	104.64	
Idpalli Ernakulam Extension	01.07.1940	7.02	111.66
Grand Total			1011.59
Erstwhile South Indian Railway (Metre Gauge)			
Sections of Railway	Date of opening	Km	Total
Madras Dhanushkodi-Main line			
Madras Beach Junction to Madras Beach	15.01.1900	0.18	
Madras Beach old to Park	01.01.1879	2.91	
Madras Park to Tindivanam	01.09.1876	123.69	
Tindivanam to Cuddalore Junction	01.01.1877	82.67	



Erstwhile South Indian Railway (Metre Gauge)

Sections of Railway	Date of opening	km	Total
Cuddalore Junction to Port Novo	01.07.1877	27.60	
Port Novo to Chidambaram	01.10.1878	10.83	
Chidambaram to Coleroon	01.07.1879	6.69	
Coleroon to Shiyali	01.01.1878	9.75	
Shiyali to Mayiladuturai	01.07.1877	19.71	
Mayiladuturai to Thanjavur	15.02.1877	70.42	
Thanjavur to Tiruchchirappalli Jn. (BG)	11.03.1862	50.69	
Tiruchchirappalli Jn. to Pudukottai	17.04.1929	52.69	
Pudukottai to Manamadurai Jn.	01.07.1930	96.38	
Manamadurai Jn. to Mandapam	01.08.1902	97.19	
Mandapam to Pamban	01.01.1914	5.02	
Pamban to Rameswaram Road	15.10.1927	10.91	
Rameswaram Road to Dhanushkodi Jetty	10.12.1908	17.12	
Dhanushkodi Jetty to Dhanushkodi Point	01.12.1914	0.11	685.56
Arakkonam Branch-			
Chengalpattu to Walajabad	01.08.1880	21.98	
Walajabad to Kancheepuram	01.01.1881	12.78	
Kancheepuram to Arakkonam (originally B.G)	08.05.1891	28.41	
Katpadi Branch-			
Villupuram to Tiruvannamalai	17.11.1890	67.27	
Tiruvannamalai to Katpadi	18.03.1891	91.94	159.21
Pondicherry Branch-			
Villupuram to the Gingee river	15.12.1879	26.51	
Villupuram Tiruchchirappalli Chord-			
Villupuram to Vriddhachalam	01.12.1927	54.06	
Vriddhachalam to Lalgudi	01.02.1929	94.90	
Lalgudi to Bikshandarkoil	10.03.1928	10.64	
Bikshandarkoil to Srirangam	12.12.1927	4.43	
Srirangam to Golden Rock-	22.08.1927	9.09	173.12
Cuddalore Vriddhachalam Section-			
Cuddalore Junction to Vriddhachalam	21.06.1928	56.92	56.92
Salem Vriddhachalam Section-			
Salem Junction to Salem Town (B.G)	01.01.1917	3.62	
Salem Town to Chinnasalem	03.02.1931	81.98	
Chinnasalem Junction to Vriddhachalam	17.08.1931	51.64	137.24
Thanjavur Branch-			
Mayiladuturai to Thanjavur	25.11.1926	28.94	28.94
Mayiladuturai Arantangi Branch-			
Mayiladuturai Junction to Mutupet	02.04.1894	86.28	
Mutupet to Pattukottai	20.10.1902	27.41	
Pattukottai to Aranthangi	31.12.1903	45.62	159.31

Sections of Railway	Date of opening	km	Total
Mannargudi Branch-			
Nidanmangalam to Mannargudi	15.02.1915	13.53	13.53
Tirutturai-Pondicherry Branch-			
Tirutturai to Agastiyampalli	15.05.1919	36.92	
Agastiyampalli to Point Calimere	20.01.1936	8.67	45.59
Nagore Branch (originally BG)			
Thanjavur to Tiruvarur	01.12.1861	54.31	
Tiruvarur to Nagapattinam	15.07.1861	23.06	
Nagapattinam to Nagore	01.12.1899	7.52	84.89
Through goods line near Tiruchchirappalli	01.04.1931	2.56	2.56
Tiruchchirappalli Tuticorin Section-			
Tiruchchirappalli Jn. to Madurai	01.09.1875	154.48	
Madurai to Tuticorin	01.01.1876	158.92	
Tuticorin to Foreshore	07.08.1899	0.53	313.93
Dindigul Coimbatore Section			
Dindigul to Pollachi	19.11.1928	120.97	
Podanur to Pollachi	15.10.1915	39.40	160.37
Mettupalayam Branch-			
Nanjundapuram Block station to Coimbatore Jn.	10.07.1941	3.77	3.77
Pollachi Palghat Section			
Pollachi to Palghat	01.04.1932	54.83	54.83
Madurai Manamadurai Section			
Madurai to Manamadurai	01.08.1902	46.67	46.67
Madurai-Bodinayakanur Branch			
Madurai to Bodinayakanur	20.11.1928	89.48	Nil
Pamban-Rameswaram Branch			
Pamban to Rameswaram	01.09.1906	11.33	11.31
Virudunagar-Tenkasi Chord			
Virudunagar to Tenkasi	30.06.1927	120.59	120.59
Maniyachchi-Shencottai Section			
Maniyachchi to Tirunelveli	01.01.1876	29.29	29.29
Pondicherry Branch			
East bank of the Gingee river to Pondicherry	15.12.1879	12.63	12.63
Tirunelveli - Tiruchendur Branch			
Tirunelveli to Tiruchendur	24.02.1923	61.44	61.44
Travancore Railway			
Tirunelveli to Kallidaikurichi	01.06.1902	30.80	
Kallidaikurichi to Shencottai	01.08.1903	50.50	81.30
Travancore Branch			
From Shencottai to Punalur	26.11.1904	47.35	
Punalur to Quilon	01.06.1964	45.52	
Quilon to Chakai	01.01.1918	58.76	
Chakai to Trivandrum Central	04.11.1931	5.51	157.14
Podanur Pollachi Railway		39.24	39.24
Podanur to Pollachi	15.10.1915		
Grand Total			2729.08



Note : 1. The dates of opening for narrow gauge lines have been mentioned in the corresponding chapters.

2. Dates of opening, date of gauge conversion, doubling, etc., for the period from 1947 onwards are tabulated below:

Dates of opening from 1947 onwards:

Section	km	Date of opening
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NEW LINES - Completed

Aranthangi - Karaikkudi	26.50	Mar.'52
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Ernakulam-Quilon (MG)

a) Ernakulam-Kottayam	59.91	17.10.56
b) Kottayam-Quilon	95.47	06.01.58
Irugur-Coimbatore Diversion (BG)	15.02	Jan.'53

Manamadurai-Virudhunagar (MG)

a) Virudhunagar-Aruppukottai	22.66	01.09.63
b) Aruppukottai-Manamadurai	43.89	02.05.64

Salem-Bangalore(MG)

a) Salem-Dharmapuri	67.40	01.06.67
b) Dharmapuri-Yesvantpur	158.58	14.01.69
c) Yesvantpur-Bangalore	5.33	14.01.69

Mangalore-Hassan (MG)

a) Mangalore-Perambur	24.00	Oct.'72
b) Hassan-Sakleshpur	42.00	May'76
c) Mangalore-Subrahmanya Road	92.00	Feb.'77
d) Subrahmanya Road-Sakleshpur	55.00	Dec.'79

Tirunelveli-Nagercoil Trivandrum (BG)

a) Trivandrum-Nagercoil	71.05	16.04.79
b) Nagercoil-Tirunelveli	73.29	02.04.81
c) Nagercoil-Kanniyakumari	15.51	16.04.79
Ernakulam and Alleppey BG	57.12	15.10.89
Karur - Dindigul BG	73.97	06.08.88
Dindigul - Madurai Parallel BG	64.32	14.04.93
Tirunelveli - Milavittan Parallel BG	51.00	21.10.93
Dindigul - Madurai BG	65.35	14.04.93
Alleppey - Kayankulam BG	43.00	21.11.92
Trichur - Guruvayur BG	24.00	09.01.94
Penukonda-Puttabarthi	21.00	22.11.00

Total MG

692.74

Total BG

574.63

GAUGE CONVERSION

Section	km	Date of opening
Baiyappanahalli-Yelahanka	16.08	Jan.'83
Kalluru-Gooty	29.50	Jan.'83
Dharmavaram-Kalluru	61.10	Jan.'83
Yelahanka-Dharmavaram	162.04	Jan.'83
Bangalore-Mysore	138.25	09.09.92
Madurai-Maniyachchi	127.25	21.10.93
Milavittan-Tuticorin	7.00	21.10.93
Chickajur-Chitradurg-Rayadurg	134.00	April'94
Chennai Beach - Tambaram	29.14	02.04.95

Section	km	Date of opening
Tambaram-Tiruchchirappalli Chord line	310.00	01.01.98
Tiruchchirappalli-Dindigul	93.00	06.01.99
Chengalpattu-Arakkonam	62.87	April 2000
Bangalore-Hubli	469.00	March'95
Birur-Shimoga Town	63.00	Sept.'94
Yelahanka-Chikballapur and Kolar-Bangarapet	61.90	
Arsikere-Hassan	47.00	23.08.96
Hassan-Sakleshpur	43.00	26.01.98
Mysore-Hassan	119.00	1998
Salem-Yesvantpur	194.00	12.01.97
Tiruchchirappalli-Thanjavur	50.00	01.01.98
Egmore-Tambaram	22.19	03.03.01
Total	2243.32	

DOUBLING

Section	km	Date of opening
Arakkonam- Chitteri	7.69	15.08.58
Mukundarayapuram-Latteri	24.83	30.09.62
Vinnamangalam-Tirupattur	20.99	17.03.61
Ponpadi-Vepagunta	16.16	26.08.64
Puttur-Pudi	13.69	05.02.66
Chitteri-Mukundarayapuram	36.07	30.09.62
Vepagunta-Puttur	6.95	17.01.60
Bommi-Danishpet	19.38	11.04.67
Danishpet-Thinnappatti	6.99	11.04.67
Thinnappatti-Salem	16.72	06.11.67
McDonald's Choultry - Mavelipalayam	12.43	17.01.69
Arakkonam-Ponpadi	19.80	19.02.63
Pudi-Renigunta	9.56	15.04.65
Tiruvottiyur-Gummidipundi	38.27	10.10.64
Latteri-Vinnamangalam	52.20	03.09.64
Morrapur-Bommi	22.74	13.10.65
Mavelipalayam-Sankaridurg	5.02	16.03.68
Salem-McDonald's Choultry	20.68	28.03.68
Cauvery-Erode	6.06	18.12.68
Sankaridurg-Cauvery	16.74	18.12.68
Gummidipundi-Gudur	89.98	21.02.71
Dasampatti-Morappur	15.27	10.01.73
Madukkaria-Kanjikode	28.38	11.11.74
Alway-Ernakulam	19.00	19.04.75
Tirupattur-Dasampatti	31.64	22.02.74
Erode-Uttukuli	37.85	18.02.76
Podanur-Madukkarai	9.66	31.07.74
Kanjikode-Palghat	13.64	11.11.74
Uttukuli-Irugar	46.22	12.08.77
Jolarpettai-Mulanur	34.29	22.02.80
Mullurcarai-Wadokancheri	8.27	18.03.81
Pudukad-Irinjalakuda	10.41	20.11.81
Palghat-Shoranur	44.20	28.03.84
Shoranur-Alway	44.67	22.11.84
Mulanur-Kuppam	12.08	12.05.81
Villivakkam-Avadi Quadrupling	16.64	26.09.87
Shoranur-Alway	24.33	11.01.86
Basin Bridge-Veysarpadi Quadrupling	1.39	31.12.85
Tambaram-Chengalpattu	30.70	02.07.90
Pattabiram-Tiruvallur Third line	17.60	10.04.94
Kayankulam-Quilon Doubling	40.84	20.12.95
Quilon-Trivandrum	65.00	19.06.00
Whitfield-Bangarapet	47.20	April'99
Calicut-Mangalore (120 km out of 221 km)	120	2000
Total	1207.96	

Annexure III

Railway Catering

Catering on the Indian Railways especially in the early 20th century was a difficult proposition. Madras Railway Company solved it to a great extent by associating with Messrs Spencer and Company Limited, Madras. Extracts from the Railway Gazette dated 17-09-1923 is reproduced below : -

"The railway companies in the south for a long while acted as their own caterers. Without the resources of the big firms who make this work their business, the result left a good deal to be desired. The food supplied was indeed reliable and wholesome, but, if one leaves the Indian mess man to his own devices, splendid monotony in the way of a menu is the result. This was the case with the catering on the old Madras Railway. An experienced traveler could tell with unerring precision the viands which would be put before him at any particular refreshment room on the line. In this connection there is the following story told which has not only the advantage of being true but also of illustrating the point admirably.

A planter from the now defunct planting regions of the Nelliampathy Hills, in the Cochin State, arriving at a breakfasting station on the line, found beefsteak on the menu, and punished it hungrily. Coming from a Hindu State in which the slaughter of kine is prohibited, beef in any form was to him a luxury. His gratitude for a good breakfast prompted him to make suitable acknowledgement in the Remarks Book. Returning some weeks afterwards he found a similar breakfast. Calling the butler aside after he had finished his meal, he inquired how it was that the butler knew he was due that day. Before the man's look of wonderment became too pronounced he added "because you have given me the same good breakfast that I had some weeks ago when I last went through." The wily butler, given his cue, quickly picked it up.

He led that confiding planter to believe that he had a system of following the traveling movement of appreciative customers. This time he pocketed a tip instead of a eulogistic entry in the Remarks Book. The menu for breakfast at that station never varied.

With the opening of the East Coast line—the North East section of the Madras Railway, now the Madras & Southern Mahratta Railway—and the more extensive railway travelling resulting there from than was possible in the days when there was only one railway exit out of the Madras Presidency, it became very evident that the catering by the railways for themselves was not satisfactory. Messrs Spencer & Co. Limited, who already had some experience on the South Indian Railway, took over the catering on the Madras Railway. With the resources of the firm at Bangalore, the centre of fresh supplies—meat, poultry, vegetables & c., and at Madras for fish, ice and other provision, this offered no great difficulty. The step was an intelligent anticipation of a great enterprise, because the amalgamation of the old Madras Railway with the Southern Mahratta Railway — the metre-gauge system which dominated the Deccan plateau like the South Indian Railway does the knuckle-end of the Peninsula—extended the work of railway catering in the south enormously.

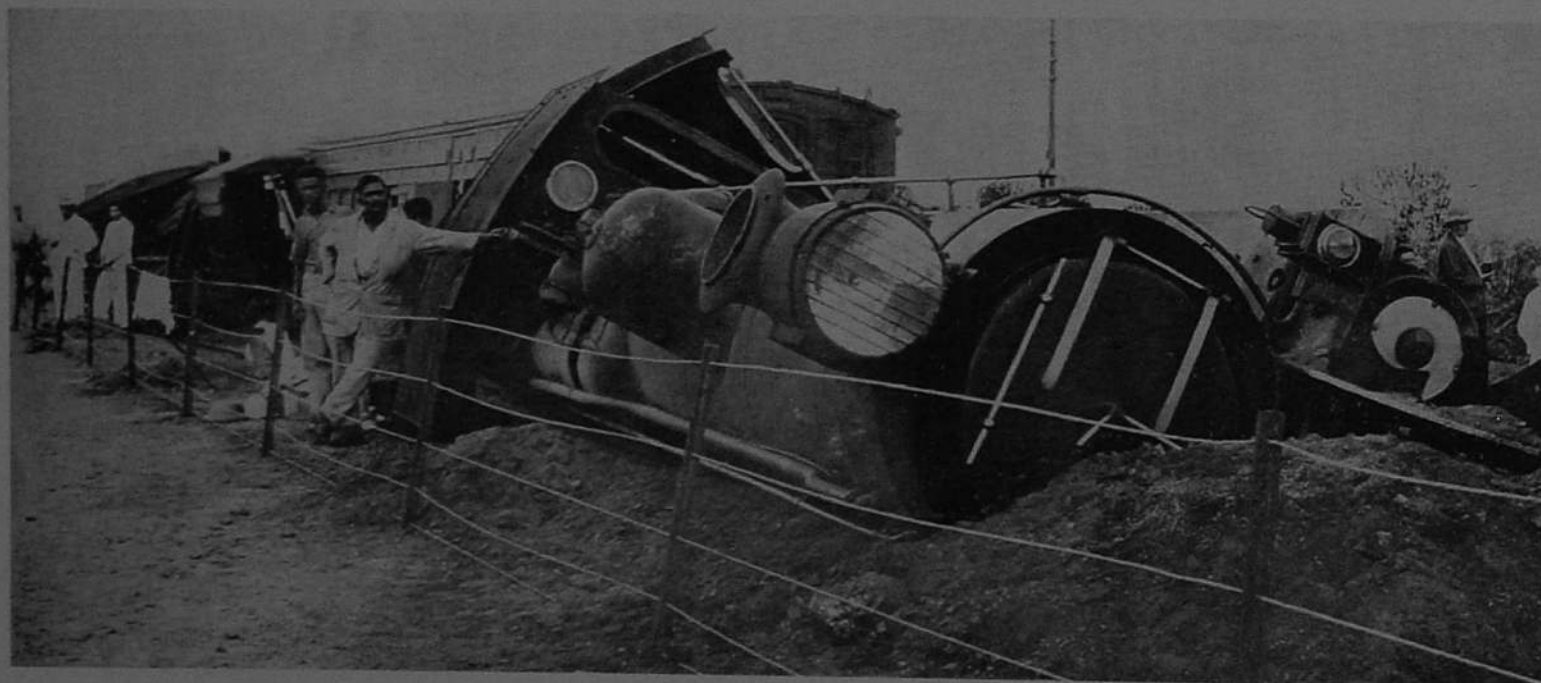
With over 100 refreshment rooms in this huge area to be stocked and served, it would be thought that there was enough to do, but refreshment rooms are but the first and most primitive development of railway catering. It is the mountain and Mahomet principle of supplying travellers' needs. The thing wanted is available, but the traveler must get to the refreshment room first. The development of the restaurant car and corridor trains—the solvitur ambulando method—has added immeasurably to the comfort of railway travelling in India, and to the responsibilities of the caterers. No longer is it necessary to fight one's way from the irksome confinement of



one's compartment through yelling jostling crowds of third-class passengers all scrambling for accommodation in an already overfull train, to a refreshment room, and there to ruin digestion by eating a hurried meal in time curtailed by the necessity for making up late running. One saunters down to the restaurant car instead and there partakes of a meal as good and as well served in every respect as it is possible to wish for. In fact if anything the menus are too elaborate, as the following specimen shows: -

MENU
SOUP ITALIAN
BOILED FISH AND BUTTER SAUCE
MUTTON CUTLETS
TEAL SALMI
ROAST SIRLOIN OF BEEF
CHEESE BOONDIA
ALBERT PUDDING
STRAWBERRY CREAM AND PEACHES
CHEESED BISCUIT
DESSERT AND COFFEE

And the prices are most reasonable. But, of course, hot weather appetites and customers with livers have to be considered and they always complain unless there is ample choice of dishes. In addition to these restaurant cars, there is usually on important passenger and mail trains a reserved compartment in which there is an attendant to supply ice and aerated waters at any time of the night or day. How essential this is only those can realize who know that too often in India there is death lurking in an unconsidered drink of water, and the same grim visitor has more than once stalked into a compartment on the long journey across the "Wild stony wilds of the Deccan" or the Scinde desert in pitiless May hot weather, and claimed a victim that some ice would have saved".



No. 2 Boat Mail which left Dhanuskodi on the first day of the Strike, after an eventful journey, was derailed between Singaperumalkoil and Kattupakkam stations as a result of removal of fish-plates and keys from the rails. The engine capsized and two third class bogie carriages telecoped, resulting in injuries to 11 persons of whom one subsequently died.

The General Strike of 1928 on South Indian Railway

Mr. M.H. Ormsby acting Agent SIR, in his annual report to the Chairman and Director of South Indian Railway for the year 1928-29 gave a vivid description of the strike of July 1928. Extracts from his report: -

"A General Strike was threatened in December 1927, but meetings eased the situation with representatives of labour. Matters however came to a crisis in July and a General Strike was called on 20th July 1928.

Genesis of the Strike

The genesis of the Strike, as is well known, was the creation of the Central Workshops at Golden Rock, and the proposals for retrenchment, necessary in the interests of efficiency and economy. To ease the hardship of retrenchment, the entertainment of labourers to fill vacancies had been discontinued for many months, and when the time came for opening the Central Workshops, a gratuity of a whole month's pay for each year of service, was offered to all who voluntarily resigned. Of the remainder, the best and the most regular workingmen were assured that they would be retained in preference to others, and tests were provided to ensure the retention of the most deserving. In the case of those not resigning but who would necessarily have to be displaced, an assurance was given that the amount of gratuity permissible to them under the ordinary rules would be increased by 50 per cent, on their discharge. Further, it was promised that efforts would be made to find them employment as occasion offered, either on this Railway itself or elsewhere. The Railway Administration was of course unable to give any guarantee to find employment for all the men, and as the men refused to agree to the methods of selection proposed by the Administration, matters came to a deadlock. Negotiations were

however continued with the leaders of the men who were invited to suggest alternative measures for the retrenchment, which, it was explained to them, was inevitable. In spite of the generous terms offered to the men and the sympathetic attitude of the Administration, other counsels appear to have prevailed with the leaders of the men, who broke off negotiations and called on the Workshop men to perform "SATYAGRAHA". It was clear from this that what the leaders and their advisers required was not settlement, but disruption, and the dispute had ceased to be a bonafide labour dispute of economic origin.

Strike Declared

On the 28th June 1928 the men entered the Workshops at Golden Rock, Negapattinam, Podanur and Tiruchchirappalli, but refused to work and sat idle. These Shops were there upon closed. This was proclaimed as a "LOCK-OUT" by the leaders who started a vigorous propaganda to secure a sympathetic Strike on the part of other, classes of staff. The leaders of the men put forward such extravagant demands that refusal was inevitable, and the dead-lock continued up to 18th July 1928 on which date the President of the Central Committee of the Labour Union, Tiruchchirappalli, suggested arbitration by the Labour Commissioner on the following four points:-

1. Payment of lock-out wages,
2. Absorption of surplus men after voluntary resignation,
3. Increase of menials' wages,
4. Redressing of running men's grievances.

The principle of arbitration in regard to the matter of menials' wages and the running staff's grievances, provided the General Strike was called off was accepted but it was pointed



out that there could be no change in the policy of reduction settled with the approval of the Home Board and the Government of India. The reply to this was that as arbitration had not been accepted on all four points, the President could not place the matter before his Committee, and in the result a General Strike was declared on the Railway with effect from the night of 19th-20th July in sympathy with the Workshop labourers.

Strike Propaganda

Strike Notices had already been issued on the 16th and a programme of action fixed at meetings held at Tiruchchirappalli on the 18th July. As soon as the time for the Strike was fixed, parties of strikers from Negapatam, Tiruchchirappalli and other centres set out in different directions along the line with other emissaries to induce the running and station staff to stop work in sympathy with the Workshop labourers. Local Secretaries had already been appointed in different Districts and at various centres, and these representatives of the Central Strike Committee received orders to carry on the programme, which had been arranged.

Activities of Strikers

Within a few hours of the declaration of the Strike, attempts were made all along the line to hold up trains leaving and arriving at stations. These attempts soon assumed a most violent form; trains were stoned, the staffs' working them were dragged out of them and were maltreated, signal lights and wires were put out of action and obstacles placed on the rails. And on the morning of the 20th, the Administration was faced with a situation unparalleled in the history of any Strike in this country or elsewhere. Notices had already been issued to the public that in the event of the Strike

being declared, arrangements would be made to run the essential train services, and with this end in view the resources of the Administration were mobilized. The Company received the whole-hearted support and assistance of the Government of Madras and its Officers in the preservation of order. Nevertheless, the difficulties which the Administration had to contend with during the early days of the Strike were manifold, and the magnitude of these difficulties can best be appreciated by telling the story of No.2 Boat Mail which left Dhanushkodi at 10.40 hours on the 20th July, the first day of the Strike.

The story of No.2 Boat Mail of 20th July

The train started on its journey followed for some distance by a crowd of strikers and sympathizers. At Dindigul the pelting of stones, which was freely indulged in at all important stations, assumed a more serious aspect and the Driver and the Firemen were injured. The train arrived at Tiruchchirappalli Junction at 21.40, about two hours late. Between Budalur and Aiyangapuram a dastardly attempt was made to wreck the train by placing a loose rail on the track. The Driver fortunately saw the obstruction and was able to pull up, with the result that the front wheels of the engine only were derailed, and he succeeded in rerailing them with difficulty. The train reached Thanjavur about 7 in the morning on the 21st or nearly 10 hours late. Mayiladuturai — where the previous evening a mob of about 5,000 men had attacked the Police and had been subsequently dispersed after the opening of fire in which 8 rioters were wounded — was passed without interference. At Panruti a number of strikers and their sympathizers laid themselves down on the track in front of the train, and had to be removed forcibly by policemen before the train could proceed further. At Villupuram the



train was stopped outside the station by a crowd, which must have numbered several thousands. Inside the train there was only one police officer and a few constables and these officials could do nothing against such odds. The train was, therefore, for some time at the mercy of the strikers. As soon as the strikers realized that the police were helpless, they threw the Driver and the Fireman out of the engine, drew the fire, let out the water and put the engine completely out of action. They then proceeded down each side of the train yelling loudly and compelling the passengers to quit the train. They also invaded the Dining Car, put out the fire in the oven and took away the firewood. A new engine steamed out of the Shed and was attached to the train, the strikers meanwhile having been kept off by a detachment of the Auxiliary Force, and so the train went on again on its eventful journey, which culminated in its final break down at 23.15 hours on the 21st between Singaperumal Koil and Kattupakkam, when it had only about 30 miles to reach its destination. The cause of the accident was found to be the deliberate removal of fishplates and keys in an attempt to wreck the whole train, and if the train had not been proceeding carefully at a moderate speed, the casualties would have been much heavier than they were. As it was, the engine capsized and two third class bogie carriages telescoped, resulting in injuries to 11 persons, of whom one was seriously injured. Through communication was restored by means of a diversion at 17.30 hrs on the 22nd July.

Derailment of No.26 Passenger

Within 12 hours of the restoration of communications on this Section, the permanent way was tampered with on another Section, viz., between Kodaikanal Road and Ambaturai, resulting in a disaster of greater magnitude. No.26 Passenger, which was running double-

headed, was derailed between these stations at 07.30 hours on the 23rd July owing to the removal of a rail from the track. Both the engines capsized as also two third class carriages, the first and the last, whilst the third carriage slightly telescoped into the second, resulting in the death of one lady passenger and injuries to 31 others.

Rioting at Tuticorin

It is impossible in a Report of this nature to deal in full with the riots that occurred at various places and the damage done to Railway property; but the following is a short account of the riot, which occurred at Tuticorin on the first day of the strike, which resulted in extensive damage to Tuticorin and Tutimelur Railway stations. At about 12 hours on the 20th a crowd of about 2,000 men lined the Railway line. Mischief commenced at the Tutimelur station where the weighing machine was smashed and lamps broken, the station building was broken into and property damaged. Later on the crowd moved eastward and came to the level-crossing gate, which was also smashed. Here a police party faced the mob and tried to disperse it, but was unable to do so. The road metal stored near by were used as missiles and showered on the police. The rioters then climbed the walls of the rice mill and continued throwing stones from there. At 2 p.m. the crowd became uncontrollable and set fire to two carriages and the oil stores. Mean while, another crowd had gathered round the engine shed earlier and the policeman on guard was hit by a shower of stones. Unable to bear this he opened fire and shot a labourer. The crowd became furious and rushed to the engine shed; windows were broken and two engines damaged. At about 4 O' clock the crowd had increased and the situation became more serious, the crowd continuing throwing stones, removing rails, and breaking telegraph wires. As evening came, the size of



the crowd swelled into several thousands and the situation became most menacing. All appeals by the Sub-Divisional Magistrate and the Deputy Superintendent of Police to the crowd to desist from violence were of no avail. A bayonet charge by the police only made the mob more furious, who set fire to a stack of sleepers. The Sub-Divisional Magistrate ordered the Police to open fire after warning the rioters; and fire was opened at 7 p.m. A contingent of reserve police arrived, and the station premises were guarded against further trouble.

End of the Strike:

The measures taken by the Administration in conjunction with the police authorities had a striking effect. All acts of violence practically ceased after the first four days although sporadic attempts to damage the line continued to be made till the middle of August. Gang men and others began to resume duty in large numbers, and by the 1st of August practically all strikers, except workshop men but including the running staff, had returned to duty unconditionally, and the General Strike had ended. The train service which had since the commencement of the strike been restricted to important trains running by daylight was gradually increased, and train services at normal

hours were resumed on patrol sections from the 2nd August and on non-patrol sections by the 5th August.

The Workshop men, however, continued to be obdurate. On July 31st the Shops at all centres were ordered to be reopened and the men were notified that they should rejoin duty before 4th August or lose their appointments. The Labour Union, however, with the intention of embarrassing the Administration, instructed all men to resign under the terms originally offered to them, and some 4,000 resignations were received by the 1st week of August, all of which were accepted. Arrangements were at once made to pay the men all their dues including the gratuity of an extra month's pay for each year of service, which was originally offered to them as compensation for the loss of their appointments.

Labour Union's recognition withdrawn

As soon as the strike was over and normal conditions were restored, the men who had struck work were assured that there would be no victimization of any kind, and that the only penalty that the strikers had incurred by striking, was loss of pay for the period they were off duty".

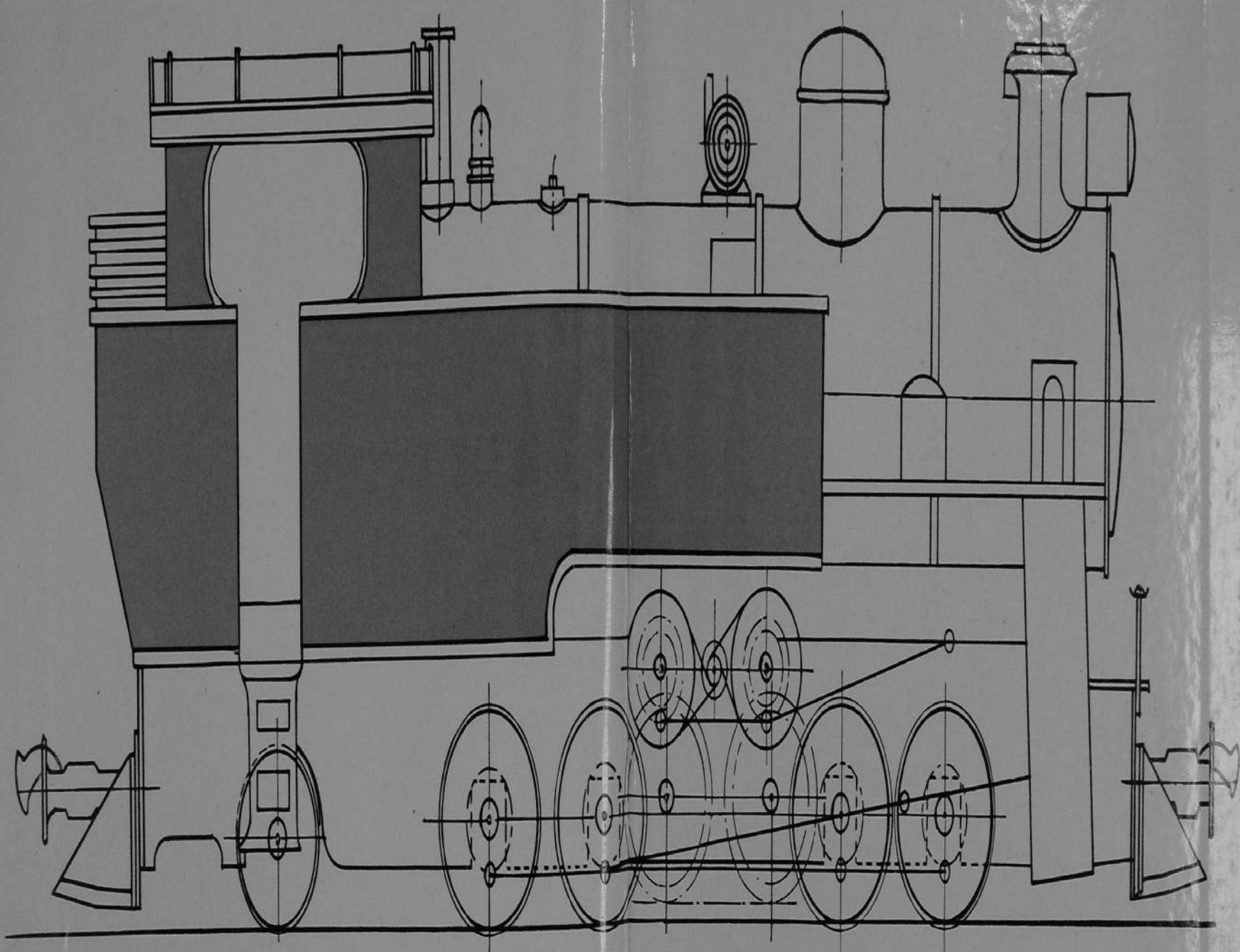
Reading List

Books

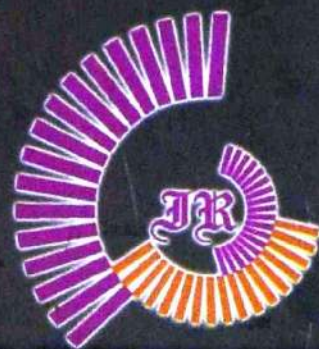
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The famous 'X' Class design came out in 1914 with X-1 (later X-37384), built by M/s Swiss Locomotive Works for Nilgiri Railway from 1914 to 1952. The wheel arrangement is 0-8-2 with two cog wheels for the third rail for better grip on the $1\frac{1}{2}$ gradient.



150 GLORIOUS YEARS

