
Architectural Heritage of Indian Railways

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Abstract

The Author has always been in the forefront of efforts to preserve the rich heritage of Indian Railways. He elaborates that the Indian Railways have taken important steps to preserve its heritage in the last 30 years. It all began with the opening of a national museum for railways and thus creating interest for preservation and heritage. This experience could be useful for many other systems, more so in Africa. Other railways should take advantage of this situation.

Indian Railways are 156 years young. During the process of its varied growth it had passed through many phases. To mention a few, from the era of Company Railways to State management, from steam locomotives to diesel and electric locomotives, from semaphore signals to colour light signals and

from conventional track laying to mechanised track laying. 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, which was glorious in its own time and in its own ways.

The Author, who has written a number of well illustrated books on the rich heritage of Indian Railways, re-emphasises that the beauty and charm of the old attracts us intermittently and that posterity demands that we should not discard the past altogether – indeed it must be preserved.

- Editor

Backdrop

When there is a reference to preservation of heritage of railways, 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 learnings from the past and

past cannot just be ignored. Apathy or indifference towards railways' heritage is understandable in India due to two reasons :

- The talk about heritage is related often only to periods prior to 1600 AD. No one talks about our achievements in recent past, more so, in technical fields during the British rule. Perhaps, we think that those were British achievements and Indians had little role in it.
- In a country where the main thrust is development, preservation gets low priority.

India did pay a high price for this apathy. Quoting a few examples from the illustrious past is worth attempting.

Rail Lines Across Western Ghats (1860-64) : The Western Ghats presented a big challenge to the railway engineers at that time. The work on the Ghat lines commenced in earnest in 1860. Forty thousand workers were engaged for four years for construction of these lines. The average daily consumption of gunpowder was 2 ½ tons during this period. The quantity of earthwork, consisting, for most part, of hard rock material was over five million cubic yards, and the quantity of cuttings and embankments was roughly equal. The two lines across Bhore Ghat and Thal Ghat were opened for traffic in 1864. Completion of such gigantic works in the toughest of terrains in four years time, without the aid of 'dynamite' and 'pneumatic tools', has fewer parallels in the technical history.

Abyssinian Railway – India's First Venture Abroad (1867-68) : A military expedition to depose the Abyssinian Ruler and release Europeans there was ordered by the British in 1867. Sir Robert Napier was appointed as Commander for the Abyssinian Expedition. Suez Canal had not been built till then and most of the material required for the expedition was shipped from Bombay. The ships of the pioneer forces reached a small port of Massawa and a base port was established nearby. The military transport demanded construction of a rail-line 12 mile long from the port of the base station. This line was built by railwaymen of GIP and BB&CI under the guidance of British army units. This constituted our first construction project abroad.

Rail-line at Godspeed (1874) : The fifty-five mile long metre gauge line from the left bank of river Ganga to Darbhanga is the fore-runner of the present day North-eastern Railway. Construction of this line was necessitated due to a severe famine in Darbhanga in 1874. Food and fodder could be brought either by river-boats or by the BG line up to Barh station of EIR and then ferried across the left bank of Ganges. For further transportation, it was necessary to construct a rail-line about 55 miles in length. Maj. F. S. Stanton, Superintendent Engineer of Rajputana Malwa Railway, was asked to undertake this job on 10 February 1874 while he was at Delhi. Stanton reached the site on 17 February 1874, carried out the survey, acquired the land, moved material to the other side of the river, commissioned the locomotives on the new line and opened the line for traffic on 17 April of the same year, i.e., 1874. (Total time - 65 days)

Lessons from these Three Examples

These events represent three specific areas in the history of development of Railways in India. The first one 'Rail Lines across Western Ghats (1860-64)' is a story of daredevil adventurism. The second event, 'Abyssinian Railway – Our first venture abroad' refers to a line built in Africa in 1867-68 by Indian Railwaymen. This was a humble beginning of India's participation in the development of Railways elsewhere in the world. Credit for construction of this first African line goes to the Railwaymen of the erstwhile GIP and BB&CI Railways. The third event, 'Rail-line at Godspeed', refers to a railway line built in a famine affected area at Godspeed. The fifty-five mile long line was built in sixty-five days from the date of its inception and included survey, land acquisition, bridge building, laying out the track, assembling the locomotives and preparation for the opening.

Hundreds of such examples exist in the hoary history of our railway system, making us proud of such happenings, but at the same time guilty of not knowing enough about them. Our apathy to heritage for these three incidences and the event of inauguration of Indian subcontinent's first train on 16 April 1853 will now be discussed in a different way for appreciation of the other side of the story.

Inaugural Ceremony of India's First Train in 1853: No relic saved for a newspaper cutting of that event is available now. All the three locomotives, peculiarly named 'Sindh', 'Saheb' and 'Sultan', have been cut up long ago. 'Sindh', which survived the two great wars, was kept on a pedestal at Matunga in Bombay and was then sold for scrap; a photo taken in 1930s is the sole reminder of its existence.

Rail lines Across Western Ghats (1860-64): We, the modern engineers, wish not to be reminded of this daredevil construction activity, as we cannot face such challenge. The then reversing station topography near Khandala could have become a railway monument. The Author came across the completion reports of this great work a few years back and was surprised to note the details and neat sketches showing the method of construction.

Rail line at Godspeed of 1874 rings a scarecrow. To a question, 'How much time would have been taken to construct a fifty-five mile rail-line from the day of its inception?', the answer varied from six months to five years. Perhaps with modern techniques and management, it is not possible to construct a fifty-five mile long line in two months time, though our predecessors did the marvel a century ago.

National Rail Museum at New Delhi

It is in the backdrop of the above that it was felt to have a Railway Museum for preserving rail edifices in early 1970s. The foundation stone for the 'Rail Transport Museum' was laid at New Delhi in 1971. This Museum is now known as National Rail Museum. It was a beginning for preserving the Indian Railways' rich heritage. 1979 witnessed the coming up of a museum at Mysore. And this was followed by a museum at Chennai and Nagpur at the turn of the century. The National Rail Museum at Delhi and the Regional Museums at a number of places have added a fillip to the preservation scenario. Initially, the thrust of the

Museums was to preserve a few rolling stock items. The National Rail Museum at Delhi was the pioneer in it and can now boast of a world record of having the oldest steam locomotive 'Fairy Queen' of 1855 vintage, in full steam. This locomotive was recommissioned in 1977 at the time of inauguration of the National Rail Museum and now runs regular heritage specials from Delhi to nearby towns. More details of some of the star exhibits at National Railway Museum at Delhi are described hereinafter.

Star Exhibits of National Rail Museum, New Delhi

Fairy Queen : This is the oldest preserved working steam locomotive in the country (of 1855 vintage) and is the first exhibit to be brought to this Museum at the time of laying the foundation stone in 1971.

It's sister locomotive hauled the first passenger train, which steamed out of Howrah Station destined for Hooghly, a distance of twenty-four miles, on the 15th of August 1854. This locomotive also hauled troop trains to Raniganj during the famous 1857 War of Independence. This locomotive, which came to this Museum on its own steam, can be brought back to life once again if required.

Maker: Kitson Thompson & Hewitson of Leeds, U.K.; Built: 1855; Railway: East Indian Railway; Gauge: 5' 6";

Weight: 26 tons; Wheel arrangement: 2-2-2 WT (underslung water tank); Frame: Double plate;

Valve gear: Stephenson; Feed: Crosshead drive pumps replaced by injectors; Safety Valve: Salter Spring Balance;

Numbers: Makers Number 481, Original EIR Number 22, Renumbered 92 in 1881, Renumbered 191 in 1884;

Named 'Fairy Queen' in 1895.

Patiala State Mono Rail : In 1907, the first section of an unusual railway on the 'Ewing System' connecting Bassi with Sirhind (6 miles) started in Patiala State. Col. Bowles who designed this system became the State Engineer and laid the Patiala State Monorail Trainsway (about 50 miles in length from Sirhind to Alampura and Patiala to Bhavanigarh). The track was a single rail along one side of the road. On this ran the load-carrying wheels of the train, while a large single wheel at the end of an outrigger ran on the road to keep the train upright.

Maker: Orenstein and Koppel of Berlin; Year Built: 1907; Railway: Patiala State Monorail Trainsway (PSMT);

Gauge: Monorail 'Zero' gauge; Wheel arrangement: 0-3-0 (Double Flange Wheels); Cylinders: Two 5 ½" x 14" outside;

Balancing Wheels: One 39" diameter Flangeless; Number: PSMT-4

Ramgotty : Among the most beautiful and rare steam locomotives is Ramgotty, 4' 0" gauge having wooden brake blocks. Its name has been given to commemorate Ramgotty Mukherjee, the last General Manager of Nalhati- Azimganj Light Railway. Nalhati Railway was taken over by the East Indian Railway and re-gauged to 5' 6" in 1892. Ramgotty became a shunting engine at Jamalpur until sold to Calcutta Municipal Corporation for refuse hauling in 1951. In its centenary year, Ramgotty was scrapped, but in 1974, it was rescued, returned to Jamalpur, and now reposes in the National Rail Museum. It is the only locomotive in India with outside Gooch Valve Gear.

Maker: Anjubault of Paris, France; Built: 1862; Railway: East Indian Railway; Gauge: Original 4' 0", altered to 5' 6" in 1892; Weight: 20 tons; Wheel Arrangement: 0-4-0 (Side tank); Frame: Inside Plate; Cylinders: Two 14" x 22" outside;

Valve Gear: Gooch Link Motion; Feed: One injector; Safety Valve: small sleek, uncommon style; Named: Ramgotty.

Garratt : The Garratt is the heaviest and the most powerful steam locomotive ever used on the Indian Railway system. Weighing a gigantic 235 tons, these 4 cylinders articulated steam locomotives were utilised mainly to haul heavy mineral & iron ore traffic on the Bengal Nagpur Railway and later on the South Eastern Railway. These locomotives were so powerful that they could easily haul a load of 2400 tons on a 1 in 100 gradient. Subsequently, the MN class with reduced water & coal capacity supplemented these.

Maker: Beyer Peacock, Manchester, UK; Year Built: 1930; Railway: Bengal Nagpur Railway; Gauge: 5' 6";

Weight: 235 tons; Wheel arrangement: 4-8-0 + 0-8-4; Cylinders: Four 20½ x 26" outside; Feed: One pump driven by dedicated steam cylinder; Valve Gear: Walschaerts; Numbers: Maker's Number: 6594, Railway Number: 815, Altered to 38815; Safety Valve: Four Rosspop type; Frame: Inside plate.

South Eastern Railway recently commissioned the Garratt locomotive and created a history of the sorts. This locomotive holds the record of being the heaviest locomotive in steam.

B-777 DHR : This is one of the most beautiful locomotive ever built. It is a wonder that these B class locomotives, some of which are more than hundred years old, are still giving immaculate service in the picturesque Siliguri-Darjeeling section of the North-east Frontier Railway. This particular exhibit was one of the first prototypes built in 1889 and served up to 1952.

Maker: Sharp, Steward & Co, Atlas Works, Glasgow; Year built: 1889; Railway: Darjeeling Himalayan Railway;

Gauge: 2'; Cylinders: Two 11" x 14"; Wheel Arrangement: 0-4-0 ST (Saddle and also Underslung); Weight: 16 tons;

Frame: Inside plate: outside; Valve Gear: Walschaerts; Feed: Two fixed nozzle injectors;

Numbers: Makers No.3517, Original Railway No.B-2, and Renumbered as B-777.

Preserving Rich Heritage

Let us take a breath and think how the Indian Railways preserve its rich heritage? Firstly, let us sub-group the various items as below :

- Railway Architecture.
- Railway Rolling Stock.
- Railway Records and Archival Material.
- Smaller Exhibits.

We shall discuss the preservation scenario group by group.

Railway Architecture

The railway companies were the most extensive patrons of new architecture in the nineteenth century. Many of their buildings were of a totally new kind, and others posed novel problems of construction. Style was integrated with techniques as the railways sought to combine the prestige and elegance of this new form of travel with crucial and imaginative innovations of engineering.

As a result of this synthesis, the railways have left a major contribution to our architectural heritage. The railway stations themselves, both big and small, provide a compendium of eclecticism – with styles ranging from Classical, Gothic, Arabic, Indo-Arabic and Traditional. Engine sheds, bridges, viaducts and the towns built by the companies all show the same attention to detail, the same combination of functional and aesthetics and, often, the same exuberance as their more familiar counterparts.

In Europe and America, the neglect and destruction of railway buildings is in the garb of reduction of railway network, while in India it is more often due to ignorance. We add up something or other and spoil an overall view; while this may be tolerable for a large number of buildings, atleast a few representative ones should be spared.

The 'Railway Architecture' can be further sub-grouped into the following :

- Major city stations.
- Town stations.
- Country stations.
- Bridges and Viaducts.
- Engine sheds.
- Railway towns.

Major City Stations

The building of a major city terminal railway station was one of the most striking architectural developments of India in the late nineteenth century. It followed the British pattern, lagging behind by a few years. Not only was the building innovative, the resultant structures were monumental in scale and unparalleled in their impact upon the city scene. No such significant additions to the town space had occurred since the forts of the Middle Ages. Examples: Bombay V.T. Station, Howrah Station and Delhi Station.

Town Stations

This includes the substantial stations of important industrial towns, country towns, ports and resorts – smaller than the great metropolitan terminal and junction, but higher than country town or village stations.

The relationship of stations with their communities is a point, which is immediately striking in this category of station buildings. Stations of the Northern and Western Railways being more familiar to the Author and where he could work out such relationship are Patiala, Bhatinda, Kalka, Bikaner, Alwar and Kota.

There is a necessity to maintain the homogeneity of station building and the community served by it.

Country Stations

One can observe the predominance of vernacular style for country stations. One can easily differentiate stations of Kalka-Simla Railway; Delhi, Ambala and Kalka Railway; NWR and RMR.

Each Railway Company adopted its own style more suitable to the terrain and made use of nearby and easily available building material to the maximum. In fact these very styles were developed to suit local terrain and material, though some times, the personal taste of the engineer can also be seen.

Bridges and Viaducts

The railways gave rise to a new architecture based on engineering and science rather than empirical knowledge. By far the most spectacular of all railway engineering works were the viaducts and large bridges. In size, materials and position they made an unparalleled impact on landscape. Some of the viaducts may remind us of such earlier works as the Roman aqueducts, but on the whole, they represent a new architectural form unconnected with local traditions.

The engineers turned to cast iron, wrought iron and mild steel for the large bridges because these were the only materials capable of producing the required long spans. Reducing the number of piers to a minimum, concentrated dead loads and the line loads and part of the engineering was to direct and distribute the applied loads through the structure of piers without overstressing the metal.

Engine Sheds

Engine sheds were a unique form of industrial building. They housed the much-loved steam locomotives and powered virtually every train for more than one hundred and twenty years. They had their own distinctive servicing and maintenance equipment and their own special atmosphere – and an unmistakable combination of odour, noise, light and smoke. Though constructed purely for the servicing and maintenance, and the locos being an undeniably dirty, oily and smoky form of motive power, many engine sheds were surprisingly elegant in appearance. A well-known example is the round house at Renigunta. In a round house, a turntable was placed centrally with exit/entrance lines and a number of stub tracks, radiating off like the spoke of a wheel. Here the locomotives were stabled and repaired with coaling platforms, and coaling cranes being provided outside. With a reduction in the number of steam locomotives, many of these sheds became redundant.

Railway Towns

Some of the Railway companies founded their works in already established industrial towns such as Bombay, Calcutta, Lahore, etc., while some other companies founded entirely new settlements as Jamalpur, Kharagpur, Freelandganj, Bulsar, etc. In a third category were the small market towns, which became railway centres and expanded very rapidly like Gangapurcity of Western Railway. These towns had a very large percentage of railway workers among their population.

The prime responsibility of preserving railway architecture is with the individual railway. The Museum provides the technical know-how to the railway system.

Railway Rolling Stock

Unlike railway architecture, obsolete railway rolling stock was easier to dispose off. During 1970s and 1980s, a large scale cutting up plan was drawn up for steam locomotives. Luckily, a pragmatic Railway Board decided to construct a railway museum at Delhi and a good number of representative locomotives could be saved and displayed in their original livery. But for the rail museum, perhaps we would have lost a few of the valuable historic and technically representative locomotives.

However, collection of artefacts does not stop after a one thorough exercise. Some of the earlier diesel and electric locomotives have yet to be added. While planning for a national museum at Delhi, it was decided right from the outset that regional museums will come up and will take care of items of regional importance. A small museum came up at Mysore in 1979, followed by a regional railway museum at Perambur, Chennai in 2002 and a narrow gauge museum at Nagpur in 2003.

A lot has been done for locomotives, while collection of vintage and representative carriages and wagons have not yet been given adequate attention. There are four carriages preserved at Delhi but this is not sufficient. Historical and technological breakthroughs in the design of carriages and wagons need to be shown by full size exhibits.

It is, therefore, necessary to have more rail museums for keeping these rolling stock items. There is an urgent need for at least two regional railway museums – one for the

Western Region and another for the Eastern Region. The Railway Board has now sanctioned a museum in Eastern sector to be set up in Kolkata.

Railway Records & Archival Material

Traditionally, Railway Engineers have been good in documentation of events like construction of new rail lines, bridges, major earth work, river training, opening of new lines and construction of buildings. In the late 19th century, the advent of camera also helped in proper documentation. There was a system of making completion reports in major construction works. Such reports contain historical background, dates of construction, and difficulties in completing works, special features and financial review of the project, and this would be supplemented with neat sketches of bridges, river training works, station alignments and plan of major railway buildings. By a good fortune, many of these completion reports are available in good shape in the India Office Library in London, and the various Railway Zonal offices.

As far as photography is concerned, the Construction Engineers engaged photographic agencies for major works. After the completion of any major bridge or any other major work, it was the practice to prepare a photographic album depicting step by step important activities of construction of that project. Often, these photographic albums were prepared with great care and were bound in thick board. Again by a good fortune, a large number of such albums have survived over hundred years and can be seen in India Office Library, UK, and various libraries at Zonal Railways Headquarters, National Archives and now in the library of Rail Transport Museum, New Delhi.

In the earlier days, Railways were a part of the Public Works Department. Most of the earliest historical documents were, therefore, clubbed in PWD files. The National Archives, New Delhi and State Archives have got the earliest records well documented and can be made use of.

The Author suggests the following lines of action for preserving important archival records, photographs and photo negatives:

- A comprehensive list/index of important records, photographs, etc., should be prepared by a Central Agency. This Index should give information like the type of records, condition of the records, places where they are kept and whether they need any restoration. This comprehensive list should be widely circulated.
- Wherever these records are kept properly, these need not be disturbed. However, where these records/photographs need restoration or preservation, help of professional agencies should be sought for. Some of these agencies are government agencies and do this job without any cost. Records/photographs, which cannot be allowed to be kept at the present place because of the danger of destruction, should be brought to a convenient place where these can be restored. Such convenient places can be the Railway Museums or Central Records Offices of the Zonal Railways.
- Some of the photographic albums now available at Railway Board's library and at Railway/State Library/Museum also need restoration and help of professional

agencies. The Author is not in favour of microfilming and then destruction of the original albums as the original albums are themselves art objects worth preserving. Fresh prints from glass negatives should be taken. Such re-prints can be sold and can earn good foreign exchange, thus becoming a source of earnings for the museums.

Smaller Exhibits

Smaller exhibits connected with railway's rich heritage can be sub-divided into the following :

- Models of railway rolling stock.
- Models of bridges, stations, buildings and other architectural items.
- Models and/or original exhibits of rolling stock components.
- Railway uniforms of different periods, badges, medals, etc., worn by staff from time to time.
- Railway passes & tickets – Metal Passes, Card Passes, tickets of earlier times, etc.
- Albums, Monograms and Coat of Arms.
- Mementos issued on the occasion of important events.
- Locomotive builders' plates, number plates, and name plates.

These smaller exhibits have been collector's items in many countries. These are also items of interest amongst railwaymen of different periods. The erstwhile Indian Railways had traditionally developed such items as art items too. Some of these are now on display at Rail Transport Museum, New Delhi and at regional museums of Mysore, Chennai, Nagpur and Udaipur. However, there is a necessity for collecting, restoring, indexing and displaying a large number of these smaller exhibits at convenient locations.

Ministry of Railways have approved the construction of a regional museum at Kolkata for the Eastern Region on which the work is on.

Enlisting for World Heritage Site

In the last few years, there is a fair competition amongst railways to get some of their properties enlisted as 'World Heritage' from UNESCO. The National Rail Museum helps the railway systems in getting the site prepared for inspection by the experts and also in the processing for acquiring such inscription.

Darjeeling Himalayan Railway (DHR) took the lead and was conferred with the coveted 'World Heritage Site' in 1999. Details of DHR inscription are incorporated in the paragraphs that follow.

Darjeeling Himalayan Railway (DHR)

DHR is world famous for sounds, smells and romance of a by-gone era. It is known for its 100-year old toy train hauled by tiny four-wheel locomotives labouring uphill at

10mph; crisscrossing the road, rural settlements & bazaars in curves, loops, “Z’s” & steep gradients during its 88 km journey; over the spectacular Himalayan landscape full of mystery and imagination. DHR’s evolution is significant both economically and in engineering terms. DHR is a work of genius. Set up in 1881, it has social & cultural importance and an everlasting and universal appeal. UNESCO, in a workshop on Darjeeling’s Past, Present and Future in 1997, resolved to use DHR for capacity building in the area for economic development and inscribed DHR as a World Heritage Site in 1999 stating the following reasons :

- 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.
- The development of railways in the 19th century had a profound influence on social and economic developments in many parts of the world. This process is illustrated in an exceptional and seminal fashion by the DHR.

How did the DHR Achieve World Heritage Status ?

Application for World Heritage status can be made only by the State Party under whose jurisdiction the site is located and involves the preparation of a very detailed document to rigorous requirements laid down by UNESCO. Indian Railways (National Railway Museum), on behalf of the Government of India, prepared an application for the DHR’s inclusion on the World Heritage List, and submitted it to UNESCO in June 1998. UNESCO’s regulations state that applications received by 1st October of a given year will be considered during the following year.

The procedure then includes an inspection of the site by an appropriate non-governmental organisation. In the case of the DHR, Dr. Robert Lee, in his capacity as consultant to UNESCO’s International Council On Monuments and Sites (ICOMOS), visited the railway in February 1999. Dr. Lee’s report was considered by UNESCO and further information collected from the Government of India. The World Heritage Committee meets once a year, and at the meeting held in Morocco at the end of November 1999, the DHR was accorded World Heritage site status.

Other World Heritage Sites on Indian Railways

Year 2004, and another ‘World Heritage Site’. This time this coveted inscription is for the Chhatrapati Shivaji Terminus, Mumbai, more commonly known as Bombay V.T. The building is an outstanding example of late 19th century railway architecture in the British Commonwealth, characterized by Victorian Gothic Revival and traditional Indian features, as well as its advanced structural and technical features.

Down in the South, Nilgiri Railway also got this coveted inscription.

With this, IR now has three sites listed in the World Heritage list – the only three that relate to Modern Indian History.

The Kalka-Simla Railway has recently been declared a World Heritage Site by UNESCO.

What Indian Railways / National Rail Museum can offer to other systems for Preservation ?

Indian Railways, in particular the National Rail Museum and Railwaymen, both in service or retired, can offer guidance to other Railway systems and also help them in preserving their rich heritage. They can also help these Railway systems to select a few sites for enlisting them on world heritage list. This could be done in the following manner :

- a) making a study of a particular railway system, know about its history and point out the important issues in the preservation scenario,
- b) making a plan for preserving heritage buildings, rolling stock and other railway edifices,
- c) helping in preserving such items with expertise from India,
- d) short-listing items for world heritage sites, and making application for such enlistment and getting them ready for inspection, and
- e) bringing out literature about the heritage of a particular Railway system and also bringing out literature about specific items.

Conclusion

Newer and more expedient technology provides us opportunities to adopt updated, modernized and improved versions of assets and structures to satisfy the ever increasing urge of human ethos for betterment of his living conditions. Still, beauty and charm of the old attracts us intermittently and posterity demands that we should not discard the past altogether. After all, the past has been glorious in its own time and in its own ways. Our innovations of today are based on learnings from the past.

The past must find its due place in our memory lanes. Indian Railways must put in its sincere efforts to preserve its heritage.

In our country, the destruction of railway buildings is often resorted to out of ignorance when we add up something or new and spoil an overall view. The bridges and viaducts are some new architectural works of science and technology rather than empirical knowledge. In photographic albums, all such systems and edifices should be preserved and displayed by professional exhibits.

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Fairy Queen



Patiala State Mono Rail



Garratt



B 777 'DHR'