

Review article

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The development of passenger carriage design and passenger service on the railways of India: The end of the 19th – the first half of the 20th century

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ABSTRACT By the end of the nineteenth century, several dozen railway companies operated in India on intercity routes, including those of several thousand kilometres in length. On both wide and narrow gauge lines, various wagons were operated: from Classes IV and III with almost no amenities (often even without the simplest benches for sitting) and up to luxury Class I coaches and saloon coaches. Almost until the beginning of the twentieth century, when organizing passenger transportation, railway companies focused on a relatively small circle of European colonizers – civil servants, British military and wealthy entrepreneurs, including Indians, and, to a lesser extent, on middle-income Indians, while virtually ignoring the interests of the poorest population groups, which made up the vast majority of Indian society. Based on the above, a fleet of passenger carriages of wide, metre and narrow gauge lines was also formed, while, of course, all technical innovations and improvements related to improving travel comfort were initially introduced in saloon coaches, first-class carriages and, decades later, often in second-class, and then third- and fourth-class carriages. This situation remained almost until India gained independence in 1947. Real improvement began in the 1960s with the renewal of the country's passenger coach fleet and an increase in the overall level of passenger service, including the second and third classes.

KEYWORDS: history of Indian railways; development of passenger transportation; types of passenger rolling stock; classes of passenger transportation

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Обзорная статья

Развитие конструкций пассажирских вагонов и обслуживание пассажиров на железных дорогах Индии: конец XIX – первая половина XX столетия

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АННОТАЦИЯ К концу XIX столетия в Индии действовало несколько десятков железнодорожных компаний, осуществлявших междугородные маршруты, в том числе протяженностью в несколько тысяч километров. На дорогах широкой и узкой колеи эксплуатировались вагоны различного класса: от IV и III – практически без удобств (часто даже без скамеек для сидения) и до роскошных вагонов I класса и вагонов-салонов.

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До начала XX в. железнодорожные компании при организации пассажирских перевозок ориентировались на относительно небольшой круг европейцев-колонизаторов, государственных служащих, британских военных и богатых предпринимателей, включая индийцев, меньше – на индийцев среднего достатка, и игнорировали интересы беднейшего населения, составлявшего его подавляющую часть.

Исходя из вышеизложенного формировался и парк пассажирских вагонов широкой, метровой и узкой колеи, при этом все технические новинки, улучшения, касающиеся повышения комфорта проезда, первоначально внедрялись в вагонах-салонах, вагонах первого класса и часто спустя десятилетия в вагонах второго, а затем третьего и четвертого класса.

Такое положение сохранилось практически до обретения Индией независимости в 1947 г., реальные сдвиги к лучшему происходят с 1960-х гг. с началом обновления пассажирского вагонного парка страны и повышения общего уровня обслуживания пассажиров, включая второй и третий класс.

КЛЮЧЕВЫЕ СЛОВА: история индийских железных дорог; развитие пассажирских перевозок; типы пассажирского подвижного состава; классы пассажирских перевозок

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According to Indian researchers, the construction of railways in the 19th century brought no real benefits to the majority of the many millions of inhabitants in the country. *“Railroads were introduced to India for quicker and more efficient access to trade. Unfortunately, they had the unintended consequence of exacerbating both environmental and economic conditions that proved damaging in times of famine. The goals of the plan to introduce railways were to lower transport costs and to give English merchants easier access to raw cotton from India. Also, the railway would simultaneously open the Indian market to British manufactured products such as cotton textiles. Initially, neither the railways promoter nor the East India Company envisioned much of a demand for passenger traffic”* [1].

For the first two or three decades of the railway's existence in India, passenger transportation was virtually unaffordable for most Indians [2]. By the 1870s, however, passenger traffic began to gradually increase.

By the last quarter of the 19th century, passenger transportation on the Indian railways had several classes of service and, accordingly, several types of carriages, varying considerably in comfort level. Small railway companies (firstly, those having railway lines with the one metre gauge, or metre gauge, MG, and those with the narrow gauge, NG), were divided into two classes: the so-called “upper class” and “lower class” (e.g., “Bengal” and “Northwestern” Rly. (MG) and the “Barsi Light” Rly. (NG) [3].

In general, by that time, four classes of service had formed on the railways of different gauges¹ in India,

based on the differences in socio-economic categories of the population — between the richest and the poorest (the gulf separating them was huge). Accordingly, four types of carriages were used, with different technical equipment and arrangement of passenger compartments: ranging from coaches of the fourth class to the first class, and higher to saloon carriages, of which there were literally only a few. The passenger service system, based on class division, was largely the same as that which existed on the metropolitan railways.

LUXURY OF SALOON CARRIAGES

The gulf that separates the fourth- and third-class passengers from privileged travellers is much in evidence when comparing their accommodation with that of first-class coaches, and even more so with luxury saloons. However, studying the history of construction and operation of the latter is important for understanding the process of technical development of rail coach manufacturing. At first, technical innovations were introduced in the designs of saloon and first-class carriages, and then in others.

By today's standards, the first saloon carriages, often presented in historical literature as ‘palaces on wheels’, were small, two-axle railway carriages with wooden frames and bodies, only about 10 metres long, and with luxurious interiors.

Naturally, Indian saloon carriages were built after the model of railway carriages designed for the British

¹ At the time of independence in 1947, India had a railway network with a total operational length of 54,500 km. Of these, 25.8 thousand km (47 %) were wide-gauge (1,667 mm) lines; 24.6 thousand km (44 %) were metre-gauge lines, and about 5.3 thousand km (9 %) had the narrow gauge (762 mm and 610 mm gauge lines) [4].



Fig. 1. The oldest surviving British royal carriage is an authentic Queen Adelaide's saloon carriage, National Railway Museum, York, England. Photo by the authors. 2013



Fig. 2. Queen Victoria's saloon carriage, built by Wolverton Works in 1869. National Railway Museum, York, England. Photo by the authors. 2013

(Fig. 2, 3). The frames and bodies of the carriages were made of wood; rare woods were used in the finishing, varnished or painted.

It is interesting to compare the appearance of the British royal carriages with one of the saloon carriages of the same period, built for King George V by the Hanover Railway in 1853. The carriage resembled a genuine coronation carriage (Fig. 4).

Even more curious is a unique vehicle in this category, — a steam locomotive (or more accurately, a steam locomotive carriage) which was built for the Viceroy of Egypt Said Pasha by the British company Robert Stephenson in 1862 (item No. 1295/1862). A small saloon, or rather a passenger compartment, luxuriously upholstered inside with brocade and silk,



Fig. 3. The interior of Queen Victoria's saloon carriage, built by Wolverton Works in 1869. National Railway Museum, York, England. This is the furnished interior of Queen Victoria's saloon carriage / Valeiko Karlina These historic photos reveal how rail travel used to look³

royalty. In England, the first such saloon carriage was built in 1842 for Queen Adelaide. The carriage is repositioned at the National Railway Museum in York (Fig. 1).

The carriage was built in 1842, and its appearance clearly shows its origins as a horse-drawn carriage. The car body resembles three carriages mounted in a row on a common frame. National Railway Museum, York, England. Photo by the authors. 2013.

British royal carriages had an elegant but rather modest appearance and luxuriously finished interiors in a style that would later be called Victorian². As an example, let's take two saloon carriages built a quarter of a century apart: Queen Adelaide's saloon carriage (1842) and Queen Victoria's saloon carriage (1869)



Fig. 4. Railway carriage of George V of Hanover, 1863⁴

² The Victorian style originated in early 19th century England and combined the most contrasting exotic and new historical design trends. Despite the pretentiousness of Victorian-style rooms, they remained cosy. This combination was achieved thanks to certain rules of design and the use of decorative elements.

³ URL: <https://uk.style.yahoo.com/historic-photos-reveal-rail-travel-130000939.html>

⁴ URL: <https://picryl.com/media/eisenbahnsalonwagen-von-georg-v-1853-9c903d>

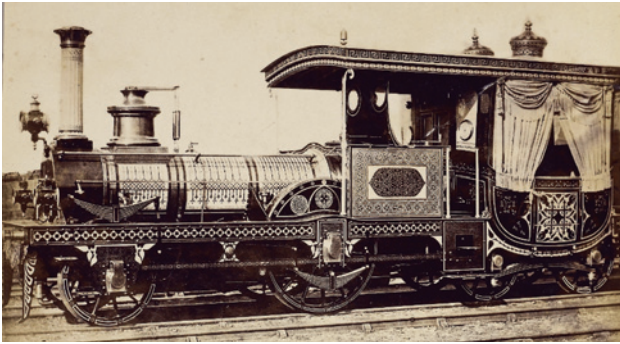


Fig. 5. Egypt Railways – The Egyptian Viceroy's private 2-2-4T steam locomotive (Robert Stephenson Locomotive Works 1295/1862) [5]



Fig. 6. Prince of Wales Saloon: built at Agra Workshop pg RMR in 1875 for Prince of Wales (later King Edward VII) for his visit to India for Royal Darbar in 1876⁵

was placed on the frame of the 1-1-2 T tank engine together with the driver's cabin.

The design of the locomotive carriage was developed by the famous English decorator Matthew Digby Wyatt, a *specialist in Arabic design* (Fig. 5). The carriage was decorated in white and black colours with gold trim. The passenger compartment was separated from the driver's cabin by a door and Said Pasha often stepped out and drove himself, moving the handles made of silver [5].

In India, the first saloon carriage was built in 1863 (or, according to other sources, in 1864 or 1866) for the Governor of Bombay⁶ [6]. The National Railway Museum in New Delhi exhibits the surviving saloon coach of Prince of Wales, the future King Edward VII (Figs. 6, 7). It was built in 1875 by Agra Workshop pg RMR for a journey across India in 1875⁷ [7]. Saloon carriages were used by rulers of separate provinces or territories, major officials of colonial and local administrations (Figs. 8–11).



Fig. 7. The interior of the Prince of Wales Saloon with the wax figures installed by the museum. Restored by Pratapnagar and Lower Parel Workshop. Complete restoration including electrical equipment, furniture. (Subhabrata). The IRFCA Photo Gallery [8]



Fig. 8. Broad-gauge coach of Maharaja of Baroda Sayajirao Gaekwad III. Restored by Pratapnagar and Lower Parel Workshop. Complete restoration including electrical equipment, furniture. (Subhabrata) [9]



Fig. 9. RA-6 saloon carriage built in the early twentieth century. Restored by Pratapnagar and Lower Parel Workshop. Complete restoration including electrical equipment, furniture. (Subhabrata). The IRFCA Photo Gallery. 2015 [8]

⁵ URL: http://trainweb.org/railworld/NRM/national_railway_museum7.htm

⁶ We could not find any images of this saloon carriage.

⁷ In 1875, the Prince of Wales made an eight-month tour of India on what became known as the Royal Durbar.



Fig. 10. Interior of RA-6 saloon carriage.
The IRFCA Photo Gallery. 2015 [8]



Fig. 11. The interior of Baroda Maharajah's coach of 1925,
Delhi Railway Museum, February 2016 [8]

FOUR CLASSES OF COACHES OF INDIAN RAILWAYS

The four classes of coaches on regular trains included comfortable first-class carriages with isolated compartments. According to some sources, in the 1860s, such coaches had already been equipped with individual toilets⁸, and some with shower rooms (cabins) [6]. The compartments of these coaches were furnished with costly furniture: upholstered armchairs, sofas, beds, carved tables and chairs (Fig. 12). First-class coaches usually had a small cabin with a shelf (or berth) for two or three servants, adjacent to a spacious compartment. Second-class coaches also had isolated compartments, but smaller in size, without toilets and with simple furniture.

In the first decades of the 20th century, first-class coaches without corridors⁹ were still the most attractive way for British colonialists and wealthy Indians to travel. Following is the description of such a coach given in an article by researcher Dipak Raychaudhuri: "Indian Railways in Old Days During the British Raj"¹⁰. Part-II": *"The compartment ran the full width of the car, thereby making it super-luxurious in terms of Space. Entire coach was divided into 6 individual cabins or suites (one 6-berth cabin, two 2-berth cabin, and three 4-berth cabin). Each cabin was a separate room or suite with its own doors opening on either side of the carriage right*



Fig. 12. A variant of a compartment in a first-class coach of the Indian Railways. The late 19th century [2]

⁸ According to some sources, private toilet facilities in first-class compartments did not appear until the early 1880s, and according to others, not until 1891 [10].

⁹ The features of the coach arrangement with and without corridors are considered in detail in the paper of Vladislav B. Zakharov, Egor Komarov. Volume Passenger Rolling Stock of Indian Railways in the First Half-Century of their Operation. 2024, Volume 3 Issue 1.

¹⁰ The British Raj (from Hindi rāj, "kingdom", "realm", "state", or "empire") was the rule of the British Crown on the Indian subcontinent, it is also called Crown rule in India, or Direct rule in India, and lasted from 1858 to 1947.

onto the platform and each of these cabins had a plush toilet facilities in the Western style and an attached shower room, as well as a narrow compartment at one end with a bench and sometimes a single berth above, for the travelers' domestic servants. The interior of these coaches was ultra-luxurious including royal-size beds/berths, carpeting, wood-work, all paneling and good electric lighting with each berth also having individual reading lights, and a minimum of two electric ceiling fans".

In third-class coaches, there were wooden benches in common passenger rooms. The lowest level of comfort was in fourth-class coaches, which were actually freight wagons. They had wooden bodies on wooden frames (four walls and a roof), with no seats, benches or berths, and looked very much like cattle wagons. Passengers sat or lay on the floor. Third- and fourth-class coaches had no lighting and no ventilation other than natural ventilation through open unglazed windows and outside doors (Fig. 13) [2].

From the 1860s (or, according to other sources, from the 1880s or even from 1891), toilets were only provided in first-class coaches, while all second- and third-class travellers had to obey the call of nature when trains stopped in the vicinity of stations. In addition to physiological and hygienic problems, the lack of water also caused mental suffering for Muslim passengers...

The decision to set up toilets in all second- and third-class coaches on Indian trains running more than 50 miles (80 km) was taken by the Railway Board as late as in 1905 [11], but even after several years it was not implemented.

On July 2, 1909, an unpleasant incident happened to a passenger by the name of Okhil Chandra Sen travelling in a second-class coach on the West Bengal Railway. He went to the station facilities, failed to get back on the train in time, and while trying to catch the departing coach, he fell and was injured... The victim wrote a letter to the Sahibganj Divisional Office, angrily describing the incident and demanding that the decision to install toilets in coaches be implemented. The letter made the newspapers and caused a stir¹¹. According to some historians, this very event and the scandal erupted prompted the railway authorities to begin installing toilets in second- and third-class coaches.

Fourth-class coaches as described here began to be withdrawn out of the traffic by the 1870s¹², being replaced by third-class coaches. By the early 1880s, only



Fig. 13. Third-class coaches of the Indian Railways. The turn of the 19th and 20th centuries [2]

a few Indian railways had fourth-class coaches, and by 1885, the fourth class of travel on Indian railways was completely abolished. Wooden benches were installed in former fourth-class coaches and these carriages were reclassified as third-class.

In the 1860s, passenger traffic on Indian railways increased. The initial abolition of fourth-class coaches led to a shortage of seats in third class. From 1862, in order to increase the capacity of these coaches, upper berths were added to the benches (lower berths) placed on the floor. Passengers could sit on them when the coach was crowded. Initially, when the coach was not crowded, passengers were allowed to lie on the upper berths, whereas only to seat on the lower benches (berths) [6].

Almost until the beginning of the twentieth century, first- and second-class coaches on Indian railways were used exclusively by Europeans and a few very rich Indians, and this segregation was based on economic reasons: very high ticket prices. Almost the entire native population of the country was only allowed, with great difficulty, to travel by the third class.

By the beginning of the 20th century, the design of comfortable saloon carriages — palaces on wheels with exquisite furniture, carpets, individual toilets and sometimes shower cabins, as well as first-class carriages in India, had incorporated the latest achievements of rail coach manufacturing and provided a high level of travelling comfort to a small circle of privileged passengers.

In the 1880s, long-distance trains had dining carriages (Fig. 14) with kitchens equipped with gas cook-

¹¹ This letter survived in the Railway Museum in Delhi and became part of the history of Indian Railways as one of the documents of the passenger's victory in the struggle for his rights. The Hilarious Letter of Okhil Chandra Sen that Prompted Indian Railways to Install Toilets on Trains [12].

¹² Different sources contain contradictory information about the time of the introduction and abolition of fourth-class coaches. Thus, paper [10] notes that in 1874–1880, "Despite early fears that the railways would be little used, passenger traffic is now so heavy that fourth class is introduced on some lines, to deal with overcrowding. This is achieved by removing all or most of the seating from third class carriages and redesignating them — 'a palliative which was short-lived'."



Fig. 14. Inside a Great Indian Peninsula Railway dining carriage, probably first class. The food served in the dining carriages was British rather than Indian. (Image: Getty Images) [13]



Fig. 15. The wooden Vice Regal Dining Car, painted with white enamel, was built in the Ajmer workshops of BB & CIR (Bombay, Baroda & Central India Railway) in 1889. The carriage was used by the Viceroy of India during his travels around the country and was part of a five-car Vice Regal train. The National Railway Museum, New Delhi [4]

ers and iceboxes¹³. Next to the dining carriage, the train often had a service carriage with a storeroom and places for the service personnel of the dining carriage, and a room for guards.

At that time long-distance trains had dining carriages, but some shorter journeys did not have dining facilities. Trains stopped at certain stations for passengers to visit refreshment rooms. The food served in the dining carriages was British rather than Indian, as the British were in control of India at that time (Image: Getty Images)

Luxury dining carriages were also included in special trains of high-ranking officials. Such trains usually

consisted of a saloon coach, two or three first-class coaches for attendants, and a dining car. Such, for example, was the train of the Viceroy of India, Vice Regal, in the late 1880s (Fig. 15) [14].

PASSENGER ROLLING STOCK OF METRE AND NARROW GAUGE RAILWAYS

You will recall that in the late 1940s, the total operational length of the Indian railway network was 54,500 km: 24,600 km (44 %) were metre gauge and about 5,300 km (9 %) were narrow gauge (762 mm and 610 mm) lines [4]. The entire length of these lines was used for both freight and passenger traffic, and this required appropriate rolling stock. On metre and narrow gauge railways, comfort levels were divided into two classes: upper and lower class.

Naturally, it was more difficult to achieve a level of comfort in metre gauge coaches, especially in 762 mm or 610 mm gauge coaches, comparable to that provided in broad gauge coaches. Nevertheless, attempts were made to provide higher levels of travelling comfort for colonial officials, British military servants and businessmen who were forced by fate to travel far from the main roads. The challenges of 'lower class' transportation were beyond the attention of railway companies. Several examples of metre and narrow gauge coaches of different classes have been preserved in Indian museums (Fig. 16–18).



Fig. 16. Coaches (left to right) of the third, first and third classes of the narrow gauge Matheran Light Railway or the Matheran Hill Railway (MHR) with the 620 mm gauge track, 21 km long in the Western Ghats¹⁴. The line was opened in 1907 and thereafter its operation was suspended several times due to damage caused by natural disasters; however, it has been back to regular operation since November 2012. Matheran Light Railway coaches, Delhi Railway Museum, February 2016 [8]

¹³ Iceboxes were replenished with blocks of ice at major stations. Please refer to Vladislav B. Zakharov, Egor Komarov. Passenger Rolling Stock of Indian Railways in the First Half-Century of Their Operation / BRICS Transport. Scientific and Practical Peer-Reviewed Journal. 2024. Vol. 3 Iss. 1.

¹⁴ The Western Ghats, or Sahyadri, is a mountain range in Western Hindustan. It stretches north-south along the western edge of the Deccan Plateau, separating this plateau from the narrow coastal plain along the Arabian Sea.



Fig. 17. Third-class coach of the open type (without windows) with separate compartments and individual exterior doors built in the early twentieth century by the Nilgiri Mountain Railway¹⁵ [8]



Fig. 18. Interior of the passenger compartment of a first-class coach on the Satpura Railway narrow gauge (762 mm) line. It was built in 1904 in Madhya Pradesh and Maharashtra in central India, and was 419 kilometres long. The coach was in use until 2015 when it was withdrawn from service due to the railway's conversion to 1,676 mm wide gauge in 2018 [2]

At the beginning of the 20th century, combustion engines were introduced on the world's railways. Initially fitted on small handcars, they were later installed on railcars designed for 10 to 20 passengers. Mainline diesel locomotives appeared in the 1930s [15]. Railcars with petrol and diesel engines — small train vehicle units, which replaced the locomotive carriages¹⁶ — were used on low-traffic lines (Fig. 19–21). Rail-mounted cars and buses were often used on narrow gauge railways [16].



Fig. 19. A twelve-seat railcar of the (762 mm) narrow gauge Kalka-Shimla¹⁷ railway, built in 1931 by Wickham, UR [16]



Fig. 20. Railcar RMC 14 of the (762 mm) narrow gauge Kalka-Shimla Railway¹⁷ built in 1933 at Armstrong Whitworth, UR [167]



Fig. 21. Interior of Railcar RMC 14 of the Kalka-Shimla Railway [8]

¹⁵ The metre gauge Nilgiri Mountain Railway (NMR) is 46 km long and was built in Tamil Nadu district in 1908. Currently, it is managed by the Ministry of Railways of India and used for commercial operation.

¹⁶ Lightweight two- or four-axle narrow and wide gauge coaches equipped with small steam engines and compact, mostly direct-flow steam boilers, which were usually heated with liquid fuel — oil, fuel oil, or paraffin. Service vehicles were also used for passenger services on low-traffic lines until the beginning of mass distribution of internal combustion-engine railcars.

¹⁷ The (762 mm) narrow gauge Kalka-Shimla railway of 96.6 km in length in North India. It was opened in 1903. Currently it is managed by the Ministry of Railways and is included in the list of World Cultural Heritage Sites. It is considered that its route passes through some of the most picturesque places in the country. It is operated as a cultural and tourist attraction.

DEVELOPMENT OF PASSENGER COACH DESIGNS FOR INDIAN RAILWAYS AT THE TURN OF THE 19TH AND 20TH CENTURIES

The technical equipment of the passenger coach fleet of the Indian railways has been improving at about the same rate as in the railways of other countries, usually with some (3–5 years) lagging behind the metropole and other advanced countries.

Initially, all passenger coaches were two-axle and by the end of the 19th century they became three-axle. Then bogie carriages began to be introduced; these were usually two-axle, which made the running smoother and improved the comfort of travel.

Until the 1870s, coaches on Indian railways — as it was initially on railways in all countries — had wooden frames and wooden bodies. Even at travel speeds of about 40–50 km/h, wooden coaches would literally smash to pieces when coming into collision or derailling (Fig. 22).

You will recall that in the public consciousness of that time, regular rail accidents were perceived as an inevitable phenomenon. Such a situation was even in Great Britain, a country with the most advanced railway technology and equipment at the time.

In 1885, the first steel-framed coaches, still with wooden bodies, were introduced in Indian railways [18]. Carriages with bodies that had the so-called metal ‘half-walls’ reaching up to the level of windows appeared at the turn of the century. In 1902, the country started to produce all-metal passenger carriages. A year later, in 1903, bogie carriages were put into operation [11]. The construction of coaches with steel frames and wooden bodies, and later with all-metal bodies (the so-called all-steel coaches), was an important factor in improving transport safety.

In the first decades of the twentieth century, Indian railways began to purchase passenger coaches with vestibule platforms between carriages [a vestibuled train] (Fig. 23), which allowed for safe and comfort-



Fig. 22. The Accident Near Nagpur on the Great Indian Peninsula Railway. 5 November 1891 – A mail train derailed near Nagpur, killing 10 passengers and injuring 34 others¹⁸ [17]

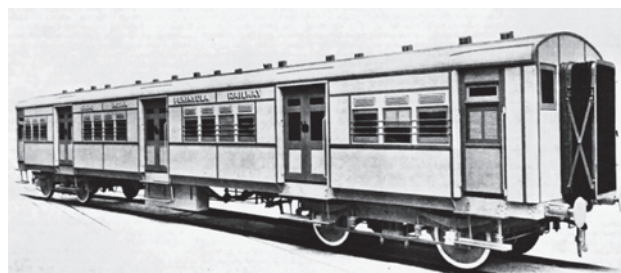


Fig. 23. All-metal third-class coach with two-axle bogies built in the 1910s and 1920s by Cammell-Laird & Company, Nottingham, UK, which during this period, in addition to its core business, shipbuilding, was also involved in building carriages for railways and metropolitan railways. The photo shows one of India's first railway coaches with an enclosed vestibule platform¹⁹

able movement of passengers and service personnel from one coach to another²⁰. On June 1, 1930, the Deccan Queen²¹ high-speed passenger train was put into operation on the route between Bombay (Mumbai) and Pune (Poona). All of its coaches had enclosed vestibule platforms, allowing passengers to move freely around the train and visit the dining carriage.

From 1879, the coaches of Indian passenger trains were equipped with vacuum automatic continuous brakes²², which improved safety and increased the speed of travelling [18].

¹⁸ Accident Near Nagpur on the Great Indian Peninsula Railway: The Wreck of the Leading Engine is Shown Lying Upon Its Side. URL: <https://www.magnoliabox.com/products/the-accident-near-nagpur-on-the-great-indian-peninsula-railway-the-wreck-of-the-leading-engine-1c130411-0392-2>

¹⁹ India Railways – Great Indian Peninsula Railway – Third Class all-steel passenger coach (Cammell-Laird & Company, Nottingham, UK). URL: <https://www.flickr.com/photos/124446949@N06/24263421452>

²⁰ Previously, passenger coaches in India had open intercar walkways, which were uncomfortable and unsafe when passengers had to walk from one coach to another. When the American Pullman Company introduced enclosed vestibule platforms between coaches in 1887, it was the first time that the coaches of a passenger train were united into a single comfortable space, and it was the beginning of the creation of Pullman luxury trains, known as ‘palaces on wheels’.

²¹ The name of the train comes from a popular nickname for Pune “दख्खन ची राणी” (Queen of the Deccan), the cultural capital of the region. The city is located in the historical and socio-political region known as the Deccan, in the mountainous plateau of the same name that stretches to the south of Mumbai from the coast of the Arabian Sea to the Bay of Bengal.

²² In the vacuum brake system, braking force was produced by atmospheric air pressure, and the brakes were released by maintaining a vacuum (partial vacuum) in the brake line of the train. Due to automatic control, the brakes are applied without the driver's intervention (automatically) in case of train breaking and violation of the brake line integrity. Integrity means that the brakes are linked into a single system and are controlled from the locomotive cab by the driver.

In the late 1890s, railway companies began to introduce lighting in passenger carriages, initially in first- and second-class coaches and then in third-class coaches. They used candles and later switched to gas lighting, when cylinders with compressed gas were placed under the coach body. At the beginning of the 20th century, electric lighting with incandescent lamps was installed in first-class coaches. In the first decades of the 20th century, Indian railways continued to use candles and gas lamps in the lower classes, for which purpose compressed luminous gas cylinders were installed in the coaches²³ [18].

The primitive air-cooling systems in compartments of first- and second-class coaches, which used the Sanders system or ice²⁴ placed in metal boxes in the compartment, were replaced by more advanced air-conditioning (initially only air-cooling) systems in passenger coaches, but still using ice (Fig. 24, 25). Note that in the 1860s, attempts were made across the world to establish industrial manufacture of ice, which is referred to as 'artificial' or 'plant' ice, using different technologies²⁵. In the United States, artificial ice began replacing natural ice in the late 1870s. The Bengal Ice Company was the first company in India to start producing artificial ice for sale in 1878 and within four or five years it completely replaced natural ice imported from the USA in the Indian market [19].

An air-conditioned coach fleet developed in India in the same manner as in other countries. At first, there were coaches with air cooling units using natural or artificial ice, which was loaded into large boxes under the body of the coach. The cooled air was directed by fans through ducts to passenger compartments. In the late 1930s, ice-based systems began to be replaced by air conditioners with various mechanical refrigeration units, approaching modern designs.

In the first decades of the 20th century, India developed a passenger transport system that remained in place until the country won independence in 1947 and that, with some subtle differences, has survived to the present day. The carriages were divided into three



Fig. 24. Delivery of ice to Frontier Mail²⁶ train coaches at Bayana Junction station. September 11, 1942. About a dozen blocks of artificial ice can be seen on the trolley [2]



Fig. 25. The metre gauge first/second-class coach of a mixed train of Western Railway (WR). On the photo, the third compartment from the left end of the coach (the third door on the left) is equipped with air conditioning (you can see the inscription 'AIR - CONDITONE' on the wall of the carriage). The ice was loaded into the undercarriage boxes under this compartment. The construction of the carriage is attributed to the mid-1940s. Photo, approx. 1951²⁷

classes according to the travel conditions, and extra-class luxury saloon carriages were also in operation.

First-class bogie coaches with separate private compartments, furnished with handmade furniture, with toilets and sometimes showers, electric lighting and air conditioning were quite comfortable and modern. Low-

²³ Sources refer to the use of paraffin (kerosene) lamps in the early period; however, this is most likely a mistake. In the world practice, paraffin lamps were rarely used for the illumination of passenger compartments of carriages due to high fire hazard from paraffin spillage. Most likely, we are dealing with a terminological confusion and mistakes in translations from one language to another: candles are often referred to as 'oil lamp' and 'kerosene lamp'.

²⁴ See: Vladislav B. Zakharov, Egor Komarov. Passenger Rolling Stock of Indian Railways in the First Half-Century of Their Operation / BRICS Transport. Scientific and Practical Peer-Reviewed Journal. 2024. Vol. 3. Issue 1.

²⁵ At the beginning, the production required large capital investments and energy costs. Moreover, initially, it was not possible to produce artificial ice of the same purity, transparency and flavour as natural ice. First of all, artificial ice began to conquer distant markets, for example, in Australia, where out of 400 tonnes of natural ice sent from the USA only 150 tonnes arrived in the form of ice after a 3.5-to-5-months-long trip, while the rest of the ice melted.

²⁶ Today this train runs between Mumbai Central and Amritsar. It is called the Golden Temple Mail and is one of the most comfortable trains in India.

²⁷ Kumar R. Harish Gallery • Heritage and History • Bombay Baroda and Central India Railway (BBCIR), 2009. URL: <https://www.irfca.org/gallery/Heritage/bbcir/o07.jpg.html>

er in comfort were the second-class coaches that were mostly used by wealthy Indians. As late as the end of the 20th century, these coaches also mostly had separate compartments, often with toilets, and were gradually provided with electric lighting. And the third class: still in the first decades of the 20th century, these coaches were biaxial and triaxial, had wooden bodies, doors opening outwards, and simple wooden benches for seating. By the middle of the 20th century, these coaches were gradually reconstructed to accommodate berths for lying down, and had little or no ventilation devices. Illuminated by candlelight or gas lighting, filled with appalling filth brought in by new and new passengers, the coaches were not cleaned for years. From the early 20th century, third-class coaches were gradually equipped with so-called toilets, which almost never had water.

The third class of Indian Railways concentrated all the inhuman policies of the colonisers, and even worse, the attitude of the wealthy Indian countrymen towards the powerless masses of the poorest population of the British colony, the wealth, resources, and strength of which have created the well-being and prosperity of the metropole and provided for the parasitic existence of several generations of white colonisers up to the present day.

THIRD CLASS OF INDIAN RAILWAYS IN THE FOCUS OF THE PROBLEMS OF COLONIAL SOCIETY AND INDIAN INDEPENDENCE STRUGGLE

Undoubtedly, there was, and still is, a difference in the level of passenger travel comfort on the railways all over the world. Differences in travel comfort have always existed and continue to exist between cabins of different classes on ships, in horse-drawn carriages of different levels of comfort before the appearance of automobiles, and today in cars of different classes and, of course, in aeroplane cabins of different levels of comfort.

For the purposes of our analysis, it is useful to briefly compare the equipment and levels of comfort for passengers in third-class coaches in different countries during the specified period of time. You will recall that in Great Britain and other countries, including Russia, the first railways used third- and fourth-class carriages, which were open platforms without roof, with low walls and simple benches (berths) without backrests (Fig. 26, 27).

In Great Britain, the Railway Regulation Act of 1844 introduced the first regulations to ensure passenger comfort. In particular, it was decided that passengers



Fig. 26. Honoré-Victorin Daumier (1808–1879). Caricature 'Impressions et Compressions de voyage' (Travel Impressions and Compressions) – Third class on the French railways²⁸. 1853

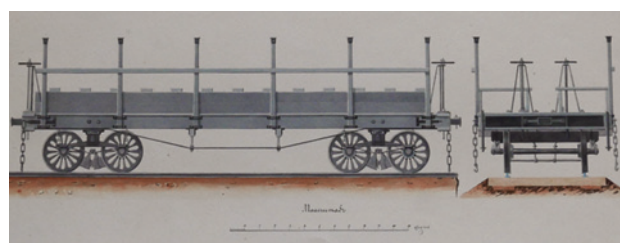


Fig. 27. Third-class open carriage of the St. Petersburg–Moscow railway, 1851. Atlas of the St. Petersburg–Moscow railway of 1851. The carriages were used for several years during the summer period. R&D Library of the Emperor Alexander I St. Petersburg State Transport University (PGUPS)

in third-class coaches had to be protected from bad weather and provided with seats, etc. [20]. For more than two decades, the owners of railway companies used various pretexts to evade their obligations under the law, but gradually travel in lower class coaches was made subject to the minimum requirements for available services.

In all countries, the struggle between passengers from the lower social strata and railway companies for a decent level of comfort during travelling in fourth- and third-class coaches continued for many decades, and in a certain sense it continues up to now. Numerous works of art — unique documents from the middle to the end of the 19th century — reflect the conditions of travel of the lower classes (Fig. 28–31).

This painting is housed in the Metropolitan Museum of Art in New York City and stands as testimony to how access to reliable and comfortable transportation continues to be associated with various manifestations of inequality with regard to large lower-class, declassed and marginalized populations around the world.

²⁸ URL: https://commons.wikimedia.org/wiki/File:Honor%C3%A9_Daumier_-_Impressions_et_Compressions_de_voyage.jpg



Fig. 28. Honoré-Victorin Daumier (1808–1879).
The Third-Class Carriage. Canvas, oil. 1862–1884²⁹



Fig. 29. Vintage illustration “Crowded interior of Third class railway carriage in Spain”. A third class railway carriage in Spain. 1890 – stock illustration³⁰

By the first years of the 20th century — before the outbreak of the First World War — in the USA and most European countries, the organisation of passenger transportation by rail had improved in the lower classes of service, and more or less stable standards and rules had been established to regulate the level of minimum travel comfort. Several countries abolished the third class on the railways and improved the conditions of travel to the level of the second class, but recurrences of disparaging treatment of passengers from the lower strata of society occurred even in technologically advanced countries, for example, in the USA, Great Britain, and France, up to the middle of the 20th century. The situation was exacerbated by the two

world wars, and in the USA, South Africa, and some other countries, it was overlaid with racial segregation even after the end of the Second World War.

In the Indian Railways at the end of the second decade of the 20th century, the attitude of the railway administration and railway employees toward passengers and toward providing the level of comfort of travel for passengers from the lower, poorer classes became politically significant. In 1917, this was reflected in a journalistic paper which today can be rightly classified as a work on the history of the Indian railways and, at the same time, on the history of the political struggle for independence from Britain. Even today,



Fig. 30. Fourth class carriage on Polish railways. The late 19th century³¹



Fig. 31. Georges Bertin Scott (1873–1943).
A third-class railway carriage in Brittany, France. Lithography. The late 19th century³²

²⁹ The Third-Class Carriage (1863-65) by Honore Daumier. URL: <https://www.artchive.com/artwork/the-third-class-carriage-honore-daumier-1863-65/#:~:text=About%20The%20Third%2DClass%20Carriage,during%20the%20industrialization%20of%20Paris>

³⁰ Vintage illustration Crowded interior of Third class railway carriage in Spain, Spanish History 19th Century — stock illustration. URL: <https://www.gettyimages.com/detail/illustration/vintage-illustration-crowded-interior-of-royalty-free-illustration/1797253866>

³¹ Technika kolejowa Europy w XIX wieku. Polska. URL: https://kolejnictwopolskie.pl/baza-wiedzy/kolejowa-technologiea-europy-xix-wieku?article_lang=en

³² Georges Bertin Scott. A third class railway carriage in Brittany, France. URL: <https://www.meisterdrucke.ie/fine-art-prints/Georges-Bertin-Scott/580331/A-third-class-railway-carriage-in-Brittany%2C-France-.html>

this paper has lost none of its significance as a poignant socio-political work against the colonial regime. It is a small book, or more precisely, a 31-page brochure by Mahatma Gandhi, *Third Class in Indian Railways* [21].

The thinker, philosopher, and political leader of the 20th century, Mahatma Gandhi³³, saw, in concentrated form, the essence of the terrible British colonial system of oppression, suppression, and humiliation of the indigenous population in the methods of organizing transportation of the poorest part of the Indian population in third-class coaches, devoting his famous book to the analysis of this phenomenon.

At the age of 19, Mohandas Gandhi went to study in London, where he graduated in law and qualified as a barrister. He returned to India in 1891 and went to South Africa in 1893, where he became a successful lawyer representing Indian traders in court processes.

During one of his rail journeys in South Africa, he was thrown out of a first-class carriage by white passengers, although he had a valid first-class ticket. The shock of feeling the injustice of what had happened to him left an imprint on his views and philosophy.

In South Africa, Gandhi first advocated the interests of Indian immigrants based on the ideology of non-violent resistance, implementing the idea of satyagraha (Sanskrit सत्याग्रह, IAST: satyāgraha, ‘standing in truth’, ‘holding on to truth’, ‘perseverance in truth’).

In 1915, at the age of 45, Mohandas Gandhi returned to India and soon began organising a movement of peasants, farmers and urban workers against discrimination and excessive land taxation. He soon became widely known as the spiritual leader of the Indian independence movement and an ardent supporter of civil disobedience as a force for social change. Mohandas Gandhi put his ideas on the tactics of non-violent struggle for independence into practice in two forms: non-cooperation with the colonial authorities and civil disobedience.

In 1917, Gandhi presented his unusual view of the hard living conditions of the poor in India, based on the experience of a railway journey from Mumbai to Madras. This brief brochure, *Third Class on Indian Railways*, which touched on subjects ranging from the filthy, overcrowded conditions in third-class coaches to philosophical reflections on cures for the diseases of an oppressed nation, became a vital work outlining the teachings of one of the greatest thinkers of the 20th century. It is the basis of his researches that made him such a powerful and respectable person.

The author describes his two-day train journey from Bombay to Madras in a third-class carriage as the

forty-eight hours of terrifying travel with hundreds of passengers, with whom Mahatma Gandhi endured physical suffering, insults and moral humiliation. “I have now been in India for over two years and a half after my return from South Africa. Over one quarter of that time I have passed on the Indian trains travelling third class by choice. I have travelled up north as far as Lahore, down south up to Tranquebar, and from Karachi to Calcutta. Having resorted to third class travelling, among other reasons, for the purpose of studying the conditions under which this class of passengers travel, I have naturally made as critical observations as I could.

I have fairly covered the majority of railway systems during this period. Now and then I have entered into correspondence with the management of the different railways about the defects that have come under my notice. But I think that the time has come when I should invite the press and the public to join in a crusade against a grievance which has too long remained unredressed, though much of it is capable of redress without great difficulty.

On the 12th instant I booked at Bombay for Madras by the mail train and paid Rs. 13-9. It was labelled to carry 22 passengers. These could only have seating accommodation. There were no bunks in this carriage whereon passengers could lie with any degree of safety or comfort. There were two nights to be passed in this train before reaching Madras. If not more than 22 passengers found their way into my carriage before we reached Poona, it was because the bolder ones kept the others at bay. With the exception of two or three insistent passengers, all had to find their sleep being seated all the time. After reaching Raichur the pressure became [Pg. 4] unbearable. The rush of passengers could not be stayed. The fighters among us found the task almost beyond them. The guards or other railway servants came in only to push in more passengers.

A defiant Memon merchant protested against this packing of passengers like sardines. In vain did he say that this was his fifth night on the train. The guard insulted him and referred him to the management at the terminus. There were during this night as many as 35 passengers in the carriage during the greater part of it. Some lay on the floor in the midst of dirt and some had to keep standing. A free fight was, at one time, avoided only by the intervention of some of the older passengers who did not want to add to the discomfort by an exhibition of temper.

Not during the whole of the journey was the compartment once swept or cleaned. The result was that every time you walked on the floor or rather cut your way through the passengers seated on the floor, you waded

³³ Mohandas Karamchand Gandhi, 1860–1948, (the honorific title “Mahatma”, from Sanskrit meaning “magnanimous, venerable”, first applied to him in South Africa in 1914, is used throughout the world) is one of the leaders of the struggle of the peoples of India for liberation from the British colonial rule, the founder of the ideology of Gandhism, the inspirer of the movement for civil rights and freedoms all over the world. He comes from a family of the Bania mercantile caste — the most influential mercantile and financial caste in India and Nepal, belonging to the Vaishya Varna [22, 23].

through dirt. The closet was also not cleaned during the journey and there was no water in the water tank...” [20].

In the first decades of the 20th century, the struggle for the decent conditions of travel for third-class passengers merged with and became part of the social struggle, one of the forms of resistance against the oppression of the broad masses of the population by colonisers, the struggle for the liberation of India from British colonial dependence, which was clearly manifested in the activities of one of the greatest leaders of our time — Mahatma Gandhi.

CONCLUSION

The liberation of India from colonial dependency in 1947 was followed by the territorial division of the formerly united country into several states according to the plan of the British colonisers, who sought to maintain their de facto dominance in the region. This domination led to bloody ethnic and religious clashes and catastrophic migration of the populations of the newly formed territories. All of those things slowed down the development of Indian railways. Nevertheless, having

gained independence, the country got a chance to resolve the accumulated challenges, including those in railway transportation.

In 1949–1950, India’s Minister of Transport and Railways, Mr Narasimha Gopalaswami Ayyangar, announced the government’s decision to set up its own modern rolling stock production in India to bring an end to the country’s forced dependence on foreign manufacturers. In 1955, the first coach factory, Integral Coach Factory (today one of the largest coach factories in the world), was built in Perambur, Madras, Chennai, under an agreement with the Swiss company Schweizerische Wagons- und Aufzügefabrik AG (SWS). This plant started manufacturing modern coaches known as the ICF type, which defined the look of the passenger coach fleet in India for several decades.

The very difficult and long process of radical renewal of the fundamentals of the organisation of passenger transportation on the Indian railways continued under the new conditions. There was a long way to go, several decades, to achieve the goals of liberation from the British colonial legacy of monstrous class division in rail transport, including the infamous and much-speculated ‘third class’.

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