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# Battle of the Gauges on Indian Railways

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**H**ow did the Indian Railways come to have a broader gauge of 5'-6" when both Britain and the USA had a standard gauge of 4'-81.2" only? Since Britain was not only the forerunner of railways but also the supplier of all railway equipment and rolling stock, the advantage to her engineering industries of India conforming to the same gauge must have been obvious. The overriding considerations must have been powerful, indeed, to justify a departure. What could these be? An interesting chapter in the history of railway development is that of the battle of the gauges which was waged intermittently and remains in conclusive even today, considering that 46 per cent of the railway track is now broad gauge while 44 per cent is metre gauge and there are also narrower gauges of 2'-6" and 2'-0".

The breakdown of Indian railways by gauges on March 31, 1952 was as follows:

Gauge	Route Miles	Track Miles
Broad 5'-6"	15,702	26,165
Metre 3'-3 <sup>3</sup> / <sub>8</sub> "	15,060	18,272
Narrow 2'-6" and 2'-0"	3,357	3,780
Total	34,119	37,675

Economy was in favour of the narrower gauge. While asking the Court of Directors to settle the question of gauges once and for all, Lord Dalhousie had deplored the "mischievous error" of permitting the introduction of two gauges in the United Kingdom to which British legislature had fallen unconsciously and perhaps unavoidably and that "the numerous and grivous (JUS evils which arose from that would remain and would long be felt throughout all England." He was determined that this evil should be averted in India. "The Government of India has it in its power 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 be rigidly enforced from the very first." He wanted that the Government should not only determine that an uniform gauge shall be established in India at the very outset of railway works, but that the uniform gauge should be one such that "science and experience may unite in selecting the best", Here was the rub. Science

and experience did not unite. Railway policy in India passed through many changes due to changes in the personnel of the Government and in financial conditions resulting from a depreciating silver standard in later years.

Expediency and shortage of funds led the Government of India to deviate from the high path of rectitude which Lord Dalhousie's minute had laid down for it. It was not found possible, in short, to avoid multiplicity of gauges which Lord Dalhousie was so eager to avoid. But what made the railway companies or the Hon'ble Court of Directors or the Government of India to adopt a gauge so much wider than the standard gauge which had been firmly established both in Britain and USA by the time India came to have her railways? The 5'-6" gauge appears to have been a brain wave of the Consulting Engineer, F W Simrns, Esq, who had been sent out by the Hon'ble Court of Directors of the East India Company "to report upon the practicability of introducing railways into India, and upon an eligible line to connect Calcutta with Mirzapore and the North Western Provinces". The Court of Directors were apprehensive that in addition to the difficulties common to rail-roads in all countries, there were others peculiar to the climate and circumstances of India. One of these was "the continued action of violent winds, and the influence of the vertical sun".

Simrns did not take long to be convinced that railways were as suitable for India as for any other country. Nay, more; he especially recommended that provision should be made right from the beginning for doubling of the track between Calcutta and Delhi, so convinced was he of the commercial possibilities of railway construction. But how to convince the Court of Directors that technical conditions were equally favourable?

A gauge wider than the standard British gauge of 4'- 8<sup>1</sup>/<sub>2</sub>", but not as wide as the 7' gauge which had been tried on the Great Western Railway and later changed into the standard gauge, he thought, would meet the problem, both of the supposed difficulties peculiar to the climate and circumstances of India.

This was because the broader gauge would lower the centre of gravity" of both the engines and carriages "the result of which will be to lessen their lateral oscillation and

render the motion more easy and pleasant and at the same time, diminish wear and tear". This was not all. The wider gauge was of great importance for another reason, viz, the fearful storms of wind so frequent at certain seasons of the year, ..." the additional 9<sup>1</sup>/<sub>2</sub>

might make all the difference between the safety and destruction of trains; and one such accident, attended as it doubtless would be, with great loss of life, would probably retard the progress of the railway system in this country very considerably".

But looking back in retrospect over the years, one may be pardoned for not taking these technical arguments very seriously. The metre gauge lines have been operated successfully for more than half a century without the engines toppling over because of high winds or anything happening to them because of the vertical sun. But the 5'-6" gauge won the day. It was not until years later that consideration of economy and lack of finances allowed narrower gauge, to enter the field.

By 1869, however, the Government of India had come to believe that "too great importance had been attached to the value of uniformity of gauge beyond certain limits. That there are many conveniences in uniformity of gauge is, of course, evident and in a compact, densely peopled, highly civilised country like England, differences of gauge have been proved by experience to be inconvenient and highly undesirable. But inconveniences, where the distances to be covered are very great, all the centres of population and trade are far apart, as is the common case in India, are of a secondary character". In brief, the Government of India, while willing to conform to the broad gauge when financial objections to it were not insuperable, wanted to leave it an open question when the prospects of the returns from opening a new line were not so satisfactory. After the first phase of construction was over, with no consideration to cost, the realisation had dawned that in all parts of the world, it had been found that "those lines were financially successful in which the capital accounts had been kept down to a low amount, and those were unsuccessful in which this had not been done".

When further development of transport has made the country more homogeneous than it is today and as conditions approach those of

England to which the Government of India had referred where multiplicity of gauges was an unmixed evil, the present state of things will be found much more inconvenient. So the case for uniformity may yet be revived, though in the near future relaying of lines to secure this uniformity will not be a practical proposition in view of the cost involved.

It must not be forgotten that the rate of development had been seriously underestimated in the early stage of railways. In fact all contemporary observers agreed that the effects of the opening of the Suez Canal had hardly been anticipated at all nor had it been foreseen that the railways would so soon form into large systems as important competing and through routes. To have insisted on the necessity of a uniform broad gauge for the whole Indian railway system would have been a very serious mistake. Moreover, in any case, in the absence of bridges which it was known could not be built for a generation or

more, since the rivers had to be crossed, as the Gauges at so many points, transshipment was unavoidable and could not be averted by the adoption of a uniform gauge.

Sir John Lawrence took up the question of gauges with the Home Authorities in 1869 and finally succeeded in securing the approval of his policy of State construction of railways on the narrower gauge of 3'-3 8". Thus the Indus Valley, Punjab Northern, Rajputana, Malva, Northern Bengal, Rangoon and Irrawaddy and Tirhoot lines constructed by the State during the decade following 1869 were on the metre gauge. The Government was then considering the introduction of metric weight system in the country and the metre gauge railways were regarded as the first step in that direction.

Despite the disadvantages of break in the gauge when some 4,255 miles of railways had already been completed on the broad gauge, the Government was compelled to change

the policy because of financial necessity and expediency. The loss suffered on account of guaranteed interest induced the search for a more economical way of extending the system. It was found that, too much emphasis had been laid on uniformity and not enough consideration given to the need of having a well stretched network of light railways in a country where distances to be traversed were great. What was more important was to connect the numerous centres of production and trade in the interior rather than build a few trunk lines on a gauge which the taxpayers could not bear. Arguing the case for metre gauge, Sir John Lawrence said . . . wholly to reject railways for a country which is not able to support the lines of the most costly description is quite unreasonable, and if, on a further examination in detail of the probable cost and returns of any of the lines, which otherwise seem desirable, the expense of the ordinary gauge seems prohibitory, while lines of the narrow gauge would be finan-

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cially practicable, I should consider it a most mistaken view to reject the narrow gauge line".

Under the new policy the rail-road requirements of the country were divided into two categories, viz, trunk lines and branch or feeder lines. It was decided to have as extensive a network of the latter category of lines as possible so that they could feed the trunk lines with traffic. In pursuance of this policy the State built lines converging on the main system which had been completed in 1869. The whole question of gauges came up for decision at the time of the construction of Indus Valley and Lahore Rawalpindi lines. The despatch of 26th October 1870, from the Duke of Argyle, the then Secretary of State for India, to Lord Mayo, the Viceroy, empowering the latter to have the final decision, gave a new turn to the history of rail construction in India.

#### ECONOMICAL GAUGE

The metre gauge system was a definite boon to the country and all the lines constructed on this gauge were paying from the very beginning. Besides being less burdensome as it cost about £7,000 less per mile than the broad gauge (the comparative costs of construction at the time were £17,000 per mile for broad gauge and £10,000 per metre gauge mile), the metre gauge lines provided the means of communication even for sparsely populated and remote areas. The success which the Government had in its new policy of construction silenced the critics who had opposed it.

The metre gauge lines were constructed, to begin with, on a provisional basis and it was contemplated to convert them into the broad gauge after the financial stringency had passed off. But the traffic results were so satisfactory that it was decided to improve the carrying capacity by providing terminal facilities, etc, in preference to conversion of the gauge. There were however departures from this sound rule on two occasions, both dictated by strategic considerations. The Panjdeh incident which brought Britain and Russia almost on the verge of war compelled the Government to undertake quick strengthening of border defences. For this it was considered necessary to convert the Indus Valley and Punjab Northern, two State lines built on metre gauge into the broad gauge. Despite the unsatisfactory ways and means position, the Government undertook to complete this project at enormous cost of unprofitable nature.

The 'new guarantee' system which the Government had to adopt owing to its failure to finance rail-building from its own resources marked the opening of yet another phase of broad gauge construction by private companies. The fact that both Bengal and North-Western and Rohilkund and Kumaon railway companies came forward to build metre gauge lines without any guarantee of interest from the Government clearly indicated that the managements regarded metre gauge lines as more sound. Subsequent events proved that their judgment was not wrong and these lines became two of the most lucrative in the country.

The defective construction policy of the Government in regard to gauge was much criticized by several railway experts. Sir Thomas Robertson, Special Commissioner for Indian Railways in 1901, came to the conclusion that metre gauge met the economic requirements of the country adequately and recommended the adoption of European and American standard gauge of 4'-8½". This was not accepted by the Government. Some twenty years later, Sir Henry Burt, a member of the Acworth Committee, held that the construction on the broad gauge was a mistake for which there appeared no justification.

#### PROBLEM OF TRANSHIPMENT

The metre gauge system which north of Ganges connected Assam with Rajasthan, and Saurashtra and in south served large tracts of the Bombay, Madras, Hyderabad, Mysore and Travancore-Cochin states became a permanent feature of Indian railways. India thus emerged as a two-gauge country involving transshipment of large volume of traffic at various points. The broad and metre gauges are connected by 53 transshipment points: 31 in North India and 22 in South. From the point of view of traffic handled, Mokameh Ghat, Banaras, Agra East Bank, Sabarmati (Ahmedabad), Ghorpuri (Poona), Bangalore City and Guntakal are more important. The facilities available at these points being limited, the movement of coal and other essential traffic is interrupted owing also to the fact that all these stations are always a potential source of loss, damage and misdirection. While examining the break of gauge shipment the Indian Railway Enquiry Committee (1947) suggested that as the conversion of the whole railway system into one gauge is beyond the realms of possibility, a small technical committee may be appointed to go into the problem of gauge conversion with a

view to reducing the number of transshipment points and of traffic involving transshipment.

The inconsistent policy of railway construction in India to serve immediate needs or tide over immediate difficulties, with no regard to long-term transport requirements of the economy, gave birth to a system which, while lacking uniformity, was of a standard too high for the country. The railway management, however, seems to be alive to the shortcomings of the railways in this regard and there is a proposal to build a new line connecting the large metre gauge systems of north and south India through the Khandwa-Hingoli link. When this project is completed and better transshipment facilities are provided, the difficulties arising from a break of gauge may be mitigated to a great extent.

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