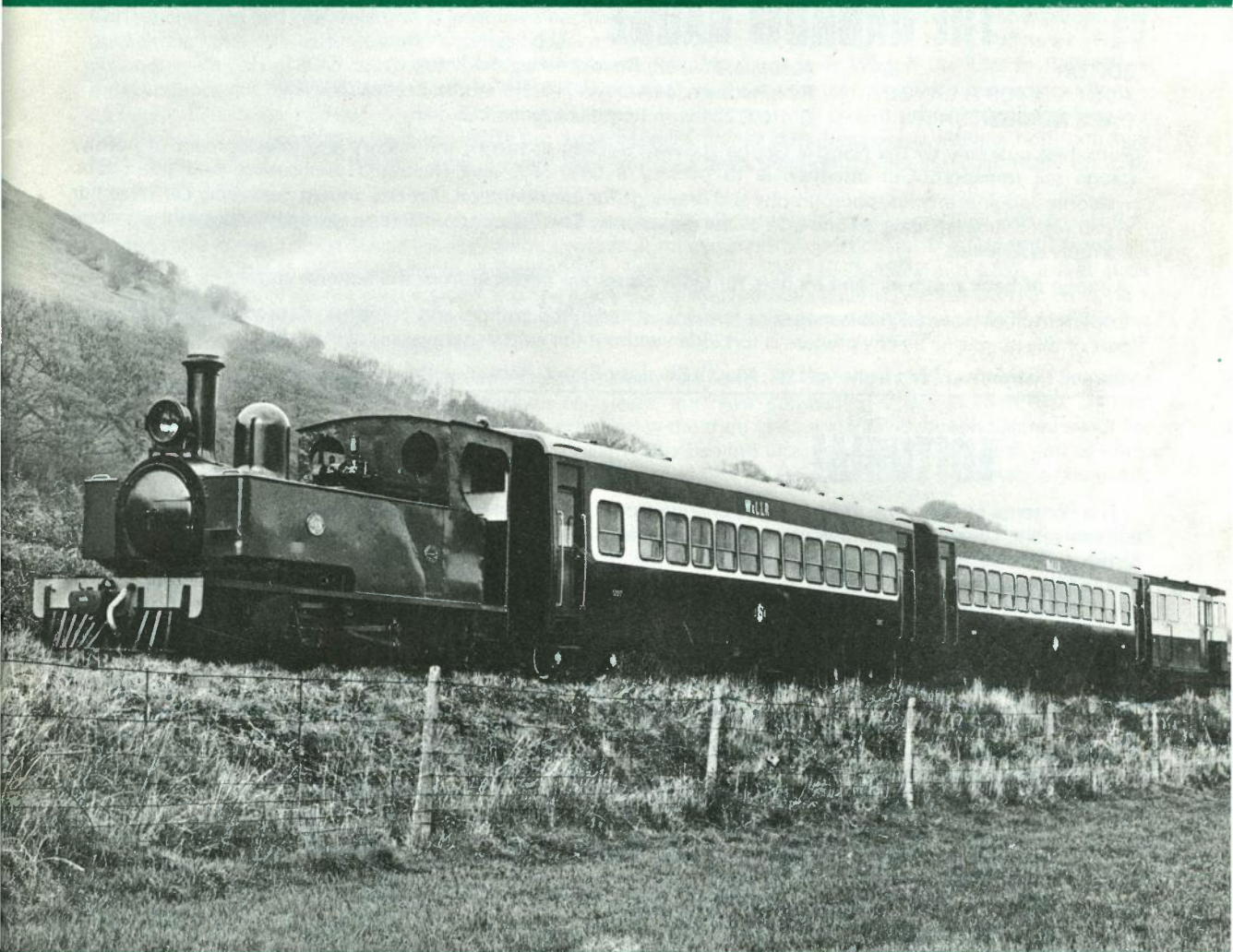


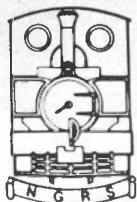


# THE NARROW GAUGE

**No.79**



**NARROW GAUGE RAILWAY SOCIETY**



# NARROW GAUGE RAILWAY SOCIETY

Serving the narrow gauge world since 1951

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The Society was founded in 1951 to encourage interest in all forms of narrow gauge rail transport. Members interests cover every aspect of the construction, operation, history and modelling of narrow gauge railways throughout the world. Society members receive this magazine and *Narrow Gauge News*, a bi-monthly review of current events on the narrow gauge scene. An extensive library, locomotive records, and modelling information service are available to members. Meetings and visits are arranged by local areas based in Leeds, Leicester, London, Preston and Stoke-on-Trent. Annual subscription £4.00 due 1st April.

## THE NARROW GAUGE

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A range of back numbers, and binders for eight issues are available from the address above.

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## EDITORIAL

No. 79 SPRING 1978

The contents of this issue mark a slight change from those of previous magazines produced by the present editorial team. Until now, we have been most careful to "balance" the contents of each issue so that all aspects of the narrow gauge scene were covered each time. This time, for various reasons, the contents are heavily biased towards steam worked public lines, and the Darjeeling—Himalayan Railway in particular. Obviously we can only use whatever suitable material is on hand and while we have never yet been short of material we often find ourselves short of certain types of articles necessary to maintain this balance. In particular, we are constantly short of articles on miniature railway and modelling topics while articles on the older steam worked industrial systems in the U.K. would also be particularly welcome.

One feature we are trying to include in every issue is a short feature in recent events in the narrow gauge world. Obviously most current news items are more suitable for our bi-monthly newsletter than this magazine but we would be most pleased to hear from anyone who can supply the odd post card size photograph of any important happening whether it be on a common carrier, preserved or industrial railway, in the U.K. or overseas.

Cover: An unfamiliar train in familiar surroundings. The Welshpool & Llanfair Light Railway "Sierra Leone" train during running-in trials between Sylfaen station and Golfa Halt on 7th May, 1978. (D.H. Ballantyne)

# FROM FREETOWN TO LLANFAIR CAEREINION

M. Swift & M.E.L. Bentley

The Welshpool & Llanfair Light Railway began its new life as a passenger-carrying railway poorly equipped with coaching stock. During the past fifteen years the Preservation Company have made strenuous efforts to improve accommodation, and provide the standards of comfort which present day passengers demand. Other railways facing the same problem have usually constructed their own coaches, but this is a costly exercise even if skilled volunteer labour is available. The W. & L., following its initial success in obtaining coaches from the Zillertalbahn in Austria, spread its net further afield to see if other 2ft 6in gauge railways had suitable stock for disposal.

Yugoslavia seemed to offer a source of bogie coaches, but the cost of purchase, renovation, and transport to Wales was extremely high. Furthermore, these were of traditional construction, and so heavy that seating capacity would have to be restricted or excessive demands made upon locomotive performance. At this point the railway considered having bogie coaches constructed by an established rolling stock builder in England, but found that the budget price of over £20000 each much exceeded the finance available. Then, on the heels of these disappointments came success in West Africa. The W. & L. knew of the plans to close the Sierra Leone Government Railway during the 1970's. Efforts to make contact with the railway were protracted and in an effort to resolve matters Mr. R.T. Russell, the W. & L. General Manager, flew out to Sierra Leone in May 1975. Correspondence had indicated that at least five coaches were worth considering. However, an inspection on site soon proved that one was not worth purchasing since the roof was adrift from the rest of the bodywork. These coaches were part of a 45 coach fleet built by Gloucester Railway Carriage & Wagon Co. Ltd. in 1961 as an Independence gift to Sierra Leone from the British Government, and were the last complete coaches built by the company. Gloucester had supplied other coaches to the S.L.R. since the early part of this century, including the first Gibbon Bogie coaches in the early 1920's but these were the first all steel prestressed, integral-body coaches built for the railway. They seemed ideal in every way, and had been used on the S.L.R. 'Last Train' on 17th November, 1974.

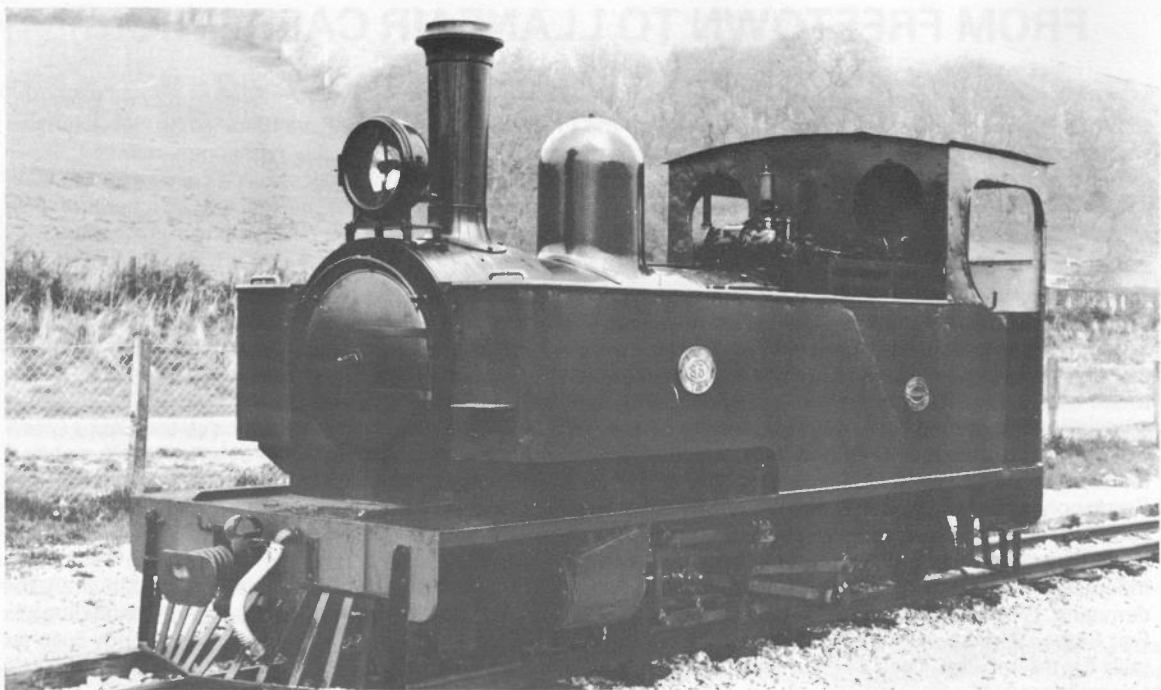
During the early months of 1975 provisional negotiations were started with a shipping line, and application made to the Wales Tourist Board for assistance towards purchase and transport costs. The General Manager's inspection resulted in an agreement to purchase third class saloons, 1040, 1048, 1066; and 1207, a first class saloon. A quantity of spares was included, and the last 2-6-2 tank locomotive built for the railway, No.85, a 1954 Hunslet. This was then stored at Fisher Lane Depot, near Freetown, but reported to be in working order, having been used in shunting and local passenger trains.

The coaches are of modern design with all steel bodies 40ft long, 7ft 3in wide and 10ft high. They have enclosed vestibule ends with opening doors on each side, and inter-connecting doors in each end. Slatted wooden longitudinal seats for 48 passengers are provided in the third class and individual upholstered seats for 16 passengers in the first class. The bogies have Timken roller bearing axle boxes carried on each end of long, inverted leaf springs, and are fitted with vacuum brakes. Termed Gibbon Bogies, they are renowned for their soft ride.

The total cost of purchase and transport was estimated at £12,000 but the Tourist Board made a grant of nearly £4,000. On the 6th August, 1975 the Elder Dempster Line freighter "Idomeneus" docked at Liverpool with a complete S.L.R. train loaded as deck cargo. The following day each vehicle was unloaded, not without an incident which resulted in damage to the body panels, and transported by road to Castle Caereinion where they were placed back on the rails once more. The Drewry diesel loco hauled them slowly to Llanfair where they joined the 2-6-2 tank No.85 which had been delivered direct by low-loader, and all coaches were washed and fumigated. The Hunslet was steamed on 10th August, and found to be rather leaky, but after minor repairs worked a few members trains during the August Bank Holiday weekend. A photograph of one of these appeared in "The Narrow Gauge" No.74.

During the winter of 1975 a considerable amount of work was carried out on coach 1048. All the interior woodwork was cleaned and painted, the lighting refurbished and the fans cleaned. The former lavatory was converted into a guards compartment and a brake valve fitted. The exterior was treated with rust preventor, filled and given six coats of paint and varnish. The final livery was red with a cream panel around the windows, and grey roof. Coach 1066 was tackled next, and this time the lavatory compartment was sealed off. The steel floors under the vestibules were corroded through and had to be replaced, together with part of the solebars and entrance steps. The first class saloon 1207 had tables between each pair of seats, but these were removed together with the remains of the upholstered seats. Unfortunately these had been home to an insect colony and had to be destroyed by burning. A new chipboard floor was fitted, and the original lavatory converted to a





*S.L.R. 85, Hunslet 3815/1954, stands at Sylfaen station during the steam trials. Note the "Grondana" coupling.*  
*(M. Swift)*



*Early evening mists start to form in the Banwy valley as the train returns to Llanfair Caereinion over Brynelin viaduct.*  
*(D.H. Ballantyne)*

guards compartment. New steps were fitted and the body panels, dented during unloading at Liverpool, beaten out. A quantity of cloth covered bus seats was obtained to replace the original seats. The coaches were stored in the open during 1976/77, and frost lifted large areas of filler from 1048, ruining the paintwork. To avoid the same problem in 1207 the bodywork was stripped right back to bare metal, treated against rust and primed. Despite this setback the first two renovated coaches went into traffic at Easter 1977, producing some interesting reaction from passengers. They were much more popular when full than partly empty, when passengers tended to slide along the longitudinal seats! On one occasion an unexpected coach party arrived and each vehicle took 56 passengers in comparative comfort.

Couplings fitted to the S.L.R. stock are unusual, and incompatible with other vehicles on the railway. They have a large centre buffer with a hook above. This hook is carried on a yoke either side of the buffer shank and fixed to a pivot beneath it. A strong coil spring is fitted between the yoke and the back of the buffer head giving some resilience between adjacent vehicles, which are fastened together by screw link couplings. This design, the 'Grondana' coupling, was devised by Felice Grondana, proprietor of a rolling stock firm in Milan and widely used on Italian light railways and steam tramways. It is a safe, secure and flexible coupling, and was adopted by the S.L.R. right from the start. These advantages, plus the availability of large quantities of modern couplings led the W. & L. to obtain 80 sets from Sierra Leone with the ultimate intention of converting stock to this type of coupling as required. Two of the Austrian coaches were first converted as match vehicles and the locomotive JOAN was also equipped for the beginning of the 1977 season. With the exception of MONARCH, all coaching stock and passenger locomotives have been fitted with this new type coupler at the time of writing.

Although the steam locomotive was in working condition it was quite clear that a major overhaul was required to meet the needs of reliable, long term service. A number of items were removed to allow a detailed assessment of just what was required, and it soon became clear that much work needed to be done. The Company was fortunate in securing a further grant under the Manpower Services Commission Job Creation Scheme, and five employees were engaged in November 1976. One of their major tasks was the restoration of the S.L.R. locomotive. The boiler cladding and fittings were first removed to allow a full boiler inspection. This was encouraging, but a patch had to be removed from the front tubeplate and a proper repair made. The rear ponytruck and ashpan were also taken off prior to removing the motion and driving wheels. The wheels were taken to the Boston Lodge Works of the Festiniog Railway Co. where W. & L. staff turned them to the correct profile. The front tube plate was repaired by a specialist welder, the smokebox rebuilt with new plates, and the smokebox door ring built up by welding to make an airtight seat for the door. The cab floor was replaced and the rear part of the frames welded up. The bottom half of the cab back sheet was showing its age and a new plate was fitted. Each coal bunker was badly corroded so the internal plates were replaced. A new ashpan was fabricated, also a new cowcatcher. All boiler repairs were completed in time for the boiler to pass a hydraulic test on 15th June 1977, enabling new cladding sheets to be rolled and fitted. In common with other W. & L. locomotives, no insulation material is fitted beneath this cladding. At this stage the boiler cladding was painted since this would be inaccessible when the side tanks were in position. The side tanks and bunkers were mounted, then the chimney and cab. The motion fitted to the loco was a collection of parts from various 2-6-2 tanks and needed a lot of attention to bring it up to standard. Grease lubrication was substituted for oil. All this work took until late 1977, but little further attention could be given during early 1978 owing to routine tasks demanding time and attention prior to the operating season. However, painting progressed during March and finishing touches were put in hand to get the loco ready for steaming.

One of the major events of early 1978 was the Enthusiasts Weekend planned by the W. & L. and Tallylyn Railway on May 13/14th. Clearly the 2-6-2 tank would be a great attraction and efforts were concentrated on having it operational by that date. Repainting in green livery was completed in ample time, and finally everything was ready for a trial run on May 7th. For this trip we had almost a replica of an S.L.R. train. The locomotive will carry W. & L. No.14 in service but it is not intended to give it a name. However, on this trip it carried S.L.R. No.85 plates and new builders plates. The train was made up of coaches 1207 and 1066, with the combination car 214 leading, and left Llanfair in the morning for a leisurely trip to Sylfaen. It remained there all afternoon while a few minor adjustments were made, making an unusual spectacle for passengers on the service trains, and passing motorists. Then, after the 17.05 from Sylfaen had cleared Castle, the train returned slowly to Llanfair to complete a very satisfactory trial.

The W. & L. has, in the past decade, taken on some very formidable tasks of importing and rebuilding locomotives and rolling stock. This latest project has again been crowned with success and added superb equipment which will clearly prove its worth in the years to come. And, for those who travel there is the delight of seeing a modern narrow gauge train from a British-built railway in Africa operating in familiar surroundings. Those connected with this achievement can be proud.

# HEREFORDSHIRE WATERWORKS MUSEUM TRUST

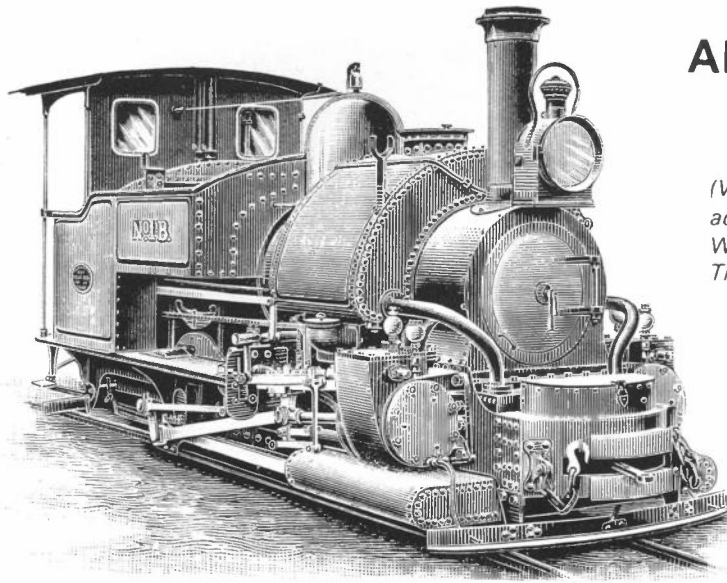


*The trust have now taken over the entire Broomy Hill Pumping Station following completion of a new pump house, and transfer of Water Authority maintenance to a new site. The new pump house required considerable excavation and civil engineering work, then final landscaping and replacement of the access road. The 2ft gauge demonstration railway was incorporated as part of this work, and Lister 52886/1962 is pictured earlier this year during a trial run over the new tramway section with two side tipping skips obtained from Alan Keef.*

*(J.L. Townsend)*

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**NORTH WALES NARROW GAUGE RY:—** Officials of the L. & N.W.R. have recently inspected the uncompleted portion of the North Wales N.G. Ry. from Snowden Ranger station through Beddgelert to Portmadoc. At present the line is open from Dinas Junction, near Carnarvon to the foot of Snowden, 9 ¼ miles, but a considerable amount of work has been done on the extension to Beddgelert and Portmadoc. It is stated that the L. & N.W.R. contemplate taking over the entire line from Dinas, the junction with the L.&N.W. Carnarvon and Afon Wen line, and completing the extension to Portmadoc, where is the terminus of the Festiniog Ry. This extension line has been nearly completed as far as Beddgelert, 3 ½ miles, for some years past. Beyond that village, however, there is need for severe tunnelling work to avoid spoiling the natural beauties of the Pass of Aberglaslyn, and the cost of this has prevented completion of the line. At one time it was proposed to work the N.Wales N.G. line by electric power, but in view of the recent addition to its locomotive stock, as illustrated and described in our issue for January, 1909, this scarcely seems immediately probable, despite the obvious ease in getting current from the water power of the surrounding district. (*"The Locomotive Magazine". August 15th, 1910.*)



## ABOVE THE CLOUDS BY RAILWAY

*(Written by A. Sarathkumar Ghosh, this account was published in "The Wide World Magazine" about 80 years ago. The original is in the Society Library.)*

### HIMALAYAN RAILWAY—PRESENT DAY

*Engraving from "The Engineer"  
1st February, 1895. (Courtesy  
R. Martin.)*

Imagine yourself breakfasting on the burning plains of India at 9a.m., and then, after passing through various intervening regions, taking tea in London at five on the same day! Imagine, also, that you are not carried through the air in some marvellous balloon without catching a glimpse of the earth beneath; on the contrary, suppose that you are travelling along the ground and passing through Afghanistan, Persia, Asia Minor, Turkey, the Tyrol, Switzerland, and France. What a wonderful panorama of changing scenery, climate, vegetation, and people! Nay, more; imagine that, as you are sipping your tea at the end of the journey, you have only to look out of the window to see on the distant horizon one dazzling line of snow-clad peaks piercing the clouds and bathed in all the colours of the rainbow.

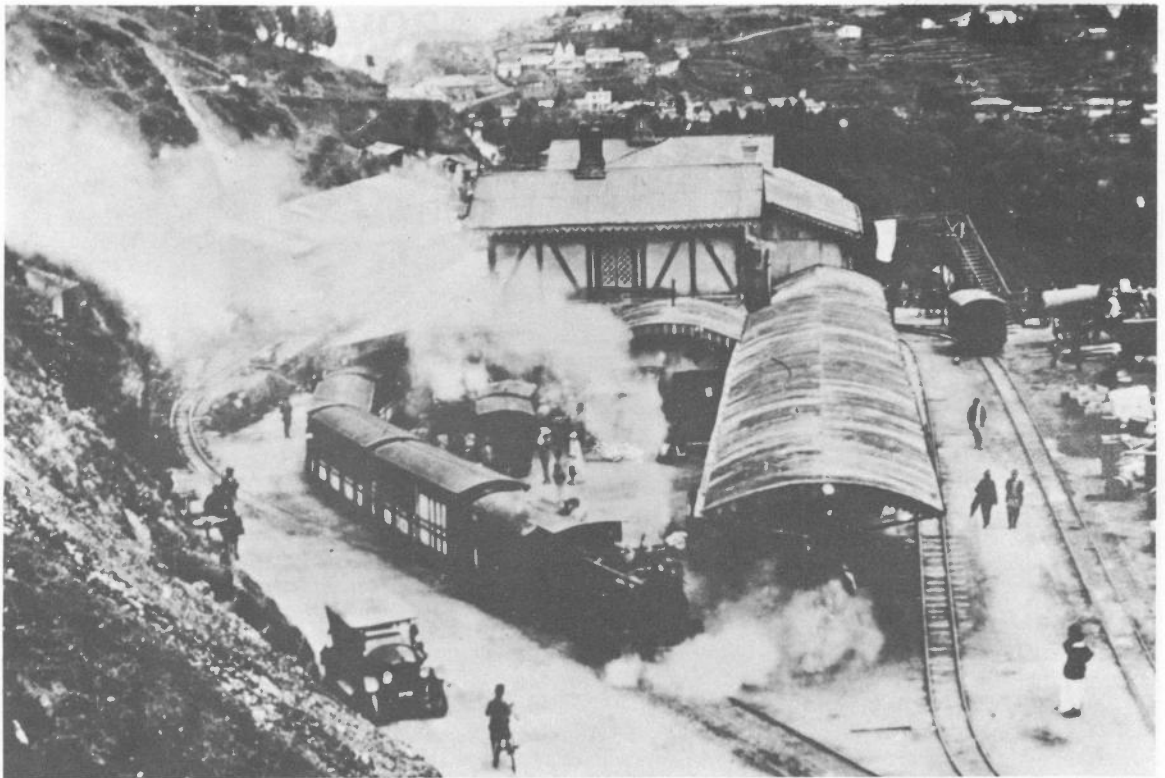
That is what practically is done every day by the Darjeeling Himalayan Railway, one of the modern wonders of the world, both as regards the stupendous nature of its enterprise and the sublime grandeur of its environments. To the tourist the whole journey from the foot of the hills, where he bids farewell to the hot plains of India, to the summit of Darjeeling, whence he beholds the mighty Himalayas in one magnificent sweep across the horizon, is like a dreamy, ecstatic transformation scene in some magic kaleidoscope. The exquisite beauty of the Taj-Mahal, the loveliest work of man, falls as far short of the sublime grandeur of the "snowy range" of Darjeeling, the most stupendous work of Nature, as a glimmering street lamp is transcended by the Aurora Borealis. But we are anticipating.

The various railway lines of India pour their human burden into Siliguri, the first station of this wonderful Himalayan railway, at about 9a.m. every day. The ascent begins at 9.30a.m., the train starting from the very door of the railway hotel. The first impression of the traveller when he sees this train is: "What a tiny toy, this Himalayan railway!" How different from the cumbrous, broad-gauge trains of the Eastern Bengal Railway one had entered in Calcutta the night before, or even the narrow gauge trains of the North Bengal one has just left behind! Why, it has only a 2ft gauge, and each car is no bigger than an ordinary dining-table!

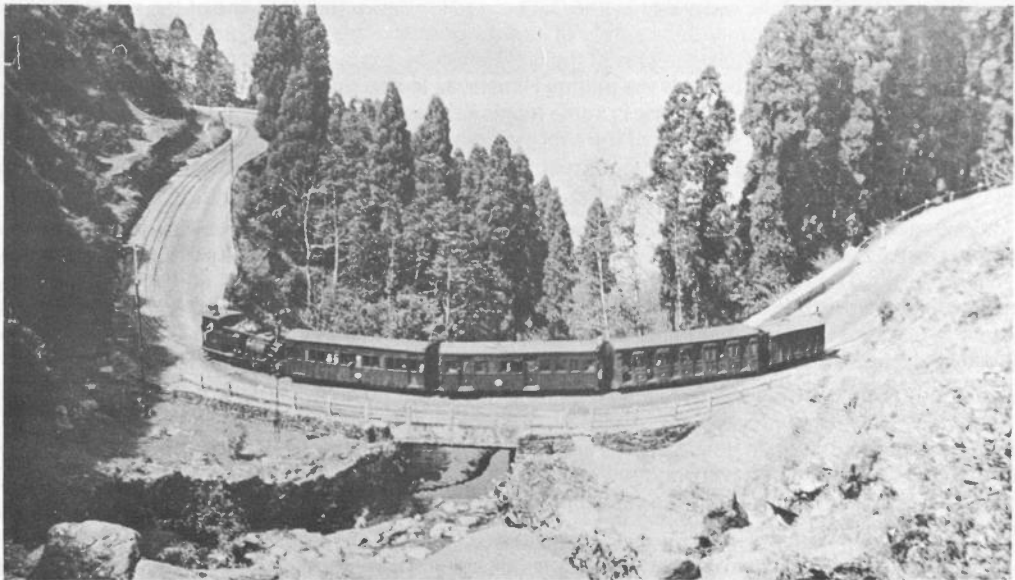
Quite true; but that little train has to reach an altitude of 7,500ft by 4p.m.! Nay, it has to creep along narrow ledges cut in the solid rock, with yawning chasms on one side and perpendicular walls on the other; it has to leap from crag to crag like a mountain goat—but we are again anticipating. No wonder, then, the whole train weighs no more than forty tons, and in traversing the fifty miles from Siliguri to Darjeeling has to go up a gradient of 1 in 23 in several parts of the line. Even this is a vast improvement from the 18-ton trains and 1 in 19 gradient of a few years ago.

On leaving the plains, the train races along at a fair speed. The country is still flat, and the vegetation semi-tropical. But notice that the permanent way in the glade is artificially raised above the surrounding plains. This artificial rise goes on for some time till the train reaches the foot of the first range of hills (they call them "hills" in India if they be anything below 10,000ft. in height). Obviously, it wouldn't do to start climbing all of a sudden. But imagine the labour of raising inch by inch that artificial embankment seven miles long.





*A Darjeeling train leaving the imposing station at Ghoom, the end of the climb up from Siliguri, probably about 1943. (collection T.H. Spink)*



*This down train cuts the corner very dangerously at one of the many spectacular viewpoints on the line. Note the brakesman clinging to the rear van. 1946. (collection T.H. Spink)*



On either side stand a vast array of sal, toon, and other timber trees, garlanded with leafy creepers and blossoming orchids; while gorgeous peacocks, bronze-winged pigeons, mynas, parrots, and other brilliant tropical birds, scared by the snorting engine, arise from the glade and flit across the forest. Formerly, wild elephants, rhinoceri, tigers, leopards, buffalo, deer, and other denizens of the tropics lurked in the jungle around; but the march of civilization, in the shape of this miniature train, has driven them further back into their wilds. One one occasion, however, not many years ago, the tables were neatly turned—and the train it was that fled. It had just entered this glade when the driver noticed a whole herd of wild elephants right across the permanent way. The big brute of a male, the leader of the herd, planted his forefeet over the track and faced the engine. The driver pulled up sharp, not twenty yards from the herd. There was a devilish twinkle in the leader's eye, and his monstrous ears flapped ominously. The driver instantly reversed the lever, and put on full speed astern till he reached the station from which he had just started. You see, his train was only an 18-tonner!

Soon after leaving this glade, the actual ascent begins. The line has been laid just where it was possible to lay it—in a narrow ledge cut out of the solid rock, on the side of a hill with the top cut off like a truncated cone, and so on till an adjacent hill is reached. Then a path is cut on the side of the latter in a line with the former and the train passes on to the second hill. In this manner, the train ascends from hill to hill. Of course, it has to wind, round and round, several times on a hill, going higher and higher at each turn, before it can meet a suitable junction on the other. One such loop is on a hill about sixteen miles from Siliguri. The hill is a truncated cone, on the side of which the line curves round several times before finding a suitable level with the next hill. The outer circle passes behind the bungalow on top of the hill, plunges into a cutting and passes under the upper level to emerge in front of the bungalow as the inner circle. It finally passes along to the side of an adjoining hill, the whole thus forming a sort of spiral staircase. The inner circle is a very sharp curve, with a radius of no more than 60ft.! Consequently, the train just creeps at a walking pace along the side of the cone, where there is not even sufficient room for a railing to protect it; if it went any faster, it would probably tumble off the line onto the outer circle beneath.

At one place, named "Agony Point," there is an extraordinary loop of the line, situated at an altitude of about 3,000ft. What an extraordinary amount of work must have been done in constructing this loop! The top of the hill was cut away till a surface of about 59 ½ ft. radius was obtained; then the line was laid at the extreme edge of this surface with no margin to spare. Even as it is, the curve is so sharp that every passenger can see his next-door neighbour. Of course, the speed here is also reduced to a walking pace, both on account of the sharp curve and the steep gradient. The passenger feels the effect of this gradient far more intensely when the train is descending than in the upward journey. The sensation is very queer; it is a combination of what one experiences in going down a switch-back, and the creepy feeling up one's back in the Underground when the brake is gradually applied on nearing a station. A sharp whistle from the engine announces this as a warning to the passengers to keep their seats. A sudden rush to one side of the train might upset the whole concern into the valley beneath, especially as the cars actually hang over the ledge! No wonder the place is named "Agony Point"!

After leaving this place (in the upward journey) there are no more loops to be met with, the method of ascent being by way of "reversing" the train alternately on the side of a hill. The method adopted is this: a number of ledges are cut on the side of the hill, one above another, so that the top of the lowermost is joined to the bottom of the one above it, and the top of this again to the bottom of the next and so on—the whole forming a complete "zig-zag". This "reversing station" is situated at an altitude of about 3,500ft., and some twenty-three miles from Siliguri.

But perhaps a better idea of the extreme difficulty of ascent in this wonderful railway can be obtained on the next section. What a terrible narrow ledge it is along which the train is passing! What a weird sensation is experienced by the passenger in going over these narrow ledges and sharp curves; and how giddy must he feel in ascending the high spur at the top. And withal, what a wild, lonely place it is, with huge rocks, steep valleys, rugged precipices on every side!

But how on earth, the reader will no doubt ask, can the train ascend such steep inclines? Won't it slip down every now and again? Well, it does slip down a little occasionally; but, then, the driver gives a sharp whistle, and extra engines, lurking in ambush behind some mysterious corner, dash out at the distress signal, and push up the train from behind till the critical point is passed. It comes on to rain and the rails become too slippery, a number of coolies immediately run out from their lair and strew sand on the rails before the train to enable the wheels to have a greater "bite" on the metal.



*"B" class 0-4-0SWT No. 790 with a Darjeeling bound train north of Kurseong in February 1974  
(L.A. Nixon)*



*A Darjeeling bound train threads its way through the streets of Kurseong in February 1974.  
The locomotive is "B" class 0-4-0SWT No. 799.  
(L.A. Nixon)*

Thus the train proceeds, overcoming the most stupendous difficulties as it were by sheer pluck and determination. The whole line is single, except in parts where down trains are allowed to pass. It would be practically impossible to lay a double line along the whole way, simply because there is not sufficient room in most of the critical parts.

But about 1p.m. an altitude of 4,500ft. is attained, and the train draws up alongside an hotel, where nearly an hour is given to the passenger for taking tiffin and changing his clothes! For, so far, the sun was pretty hot; consequently, the light clothes of the plains were a sufficient protection. Now, however, the train will ascend regions of a temperate climate, and some little extra clothing—even if it be an overcoat—is essential.

Higher and higher the train climbs, amidst the grandest scenery. Alpine meadows mantle the mountain side, oaks, pines, and rhododendrons dot the ground at every step. Down the steep mountains two streams, the Rungeet and the Teesta, rush along swiftly and join together in one broad river. Nor is this all. As soon as we attain an altitude of 5,000ft., white banks of cloud begin to gather on all sides. At one moment the sun is shining brightly above us; then comes a cloud, and we are left in sudden darkness. We ascend a little higher—the cloud envelopes us like a delicious cool mist—then passes away, leaving us in bright sunshine. We ascend yet another spur, turn round a corner—there below us is the cloud covering the mountain side like a bundle of fleece. Suddenly, there is a break in the range of mountains—down, down, forty miles away, we catch a glimpse of the plains below like a green cloth with a white chalk-mark meandering all along it—the united stream, the junction of whose tributaries we have just passed. Suddenly, a dark cloud obscures the sun—its huge shadow rushes along the plains with a frightful velocity and sweeps over stream and vale and mountain in one gigantic embrace.

Thus we climb henceforth. Beauty upon beauty, grandeur upon grandeur, succeed one another in an endless panorama. The human mind is lost in an ecstasy of delight, and knows not which way to turn to admire. Primeval forests cover the valleys, orchids, ferns, creepers hang in the gayest festoons on every side, while gorgeous-plumed hill mynas flit across from tree to tree, like so many butterflies. And still we ascend, higher, yet higher. At last an altitude of 7,500ft. is reached—suddenly, as we creep along the edge of a precipice, there bursts forth before our startled gaze the first glimpse of the snow-clad Himalayas. It is a feeling of intense awe that subdues us at that moment, and the lesser joys of the journey are merged in a sublime contemplation. The railway still curls and curls before us for three long miles, while the snows appear, disappear, reappear, till the last curve is reached and the train enters the spur on which stands Darjeeling, the “Queen of the Himalayas.”

Ascending the slope above the railway station, we get a magnificent view of the town beneath our feet and the dazzling line of snows far away on the distant horizon. This view, which is perhaps the most unique of its kind, gives at one glance the longest line (150 miles) of snow-clad peaks in the world. On the left of is Mount Kunchinjunga (28,500ft.) with several other peaks, all higher than 25,000ft. Sunrise on this line of eternal snow is, perhaps, the most beautiful sight in all Nature. The writer was fortunate enough to occupy a room so conveniently situated that he could view this spectacle without lifting his head from his pillow. It was indeed a dreamland into which he felt himself transported. As the first dawn appeared, there seemed to be a glimmering light hovering like a halo over the snowy peaks; then, as the sun mounted higher and higher, there burst forth a succession of gorgeous colours around, above, beneath the snows, which glided imperceptibly into one another as in a transformation scene. Then, at last, as the sun arose clear above the horizon, the colours receded into the background, and the snows stood out in one long line of dazzling white.

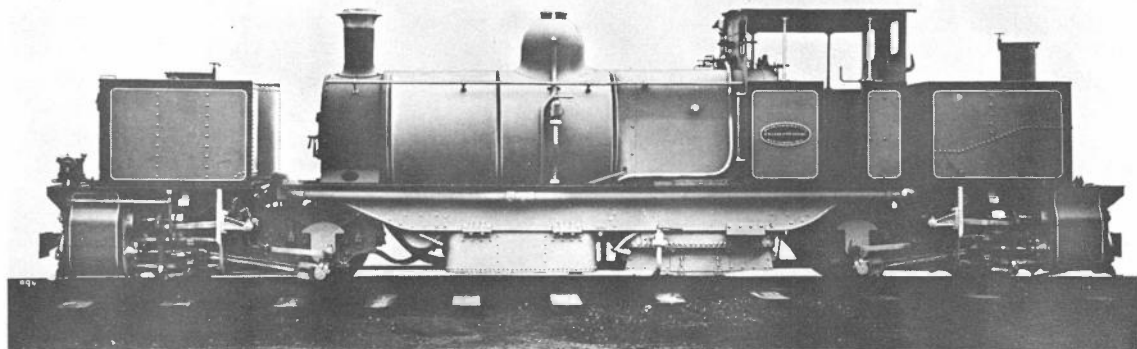
Having seen these wonders, the traveller naturally desires to crown his triumphs by ascending a neighbouring hill, called Santakphu, in order to see Mount Everest (29,002ft.) the highest peak in the world. There he sees the mountain, standing amidst a vast solitude, clothed in dazzling white; a cloud overshadows him, and he veils his face in reverent awe because of the glory before him. Then falling, as it were, to the earth again from these wondrous realms of creation, he looks to the valleys beneath to seek relief. Tiny specks of tea-gardens, enveloped in fleecy clouds, dot the dark foreground here and there.

These tea-gardens are well worth a visit, as the tourist is sure to receive a right royal welcome from the planters. Moreover, these vanguards of British industry are more than merely ornamental; they are useful and prosperous, the production of “hill” tea alone amounting to nearly 10,000,000lb. per annum

In closing this description, all too short to convey an idea of even a hundredth part of the glory and magnificence of the “Queen of the Himalayas,” we mention an extraordinary fact which the tourist may well bear in mind on his return journey. In addition to the train, trollies are run down the hill by gravity. Each is provided with two powerful brakes under the control of an engineer, and is permitted to go down hill at so great a speed as twenty-five miles per hour. If, therefore, you miss your down-train at any point on the line, you have simply to hire one like this, and chase the train—even if the latter has had a start of three or four hours! Thus everything in this wonderful railway is done in a wonderful manner.

# THE DARJEELING-HIMALAYAN RAILWAY GARRATT

M. Swift



*(North Western Museum of Science & Industry)*

The Darjeeling-Himalayan railway is probably the best known overseas narrow gauge line, and its many attractions have been widely reported in the railway and travel press. In a changing world it has hardly changed at all, and remains a difficult mountain railway worked by small four coupled locomotives. But the situation could have been very different, as "The Engineer" stated on 10th March, 1911: "To work such a difficult line with safety the ordinary locomotive is ill-adapted and it was decided to place an order with Beyer, Peacock & Co. Ltd. of Manchester for a Garratt engine, the features in the design of which rendered it particularly suitable for such work."

The line certainly is a difficult one. From Siliguri to Sookna (7 ¼ miles) the ruling grade is only 1 in 281, but from there the track climbs at an average gradient of about 1 in 30 through Tindharia (19 ½ miles), and Kurseong (31 miles) to Ghoom (47 miles). The remaining four miles to Darjeeling itself are downhill, mostly at 1 in 31, but with ¾ mile graded at 1 in 23! And, if this profile was not enough there are four spirals, four reversals, and curves down to 60ft radius. The specification issued to the builder stipulated that the locomotive should be capable of traversing 60ft radius reverse curves separated by a tangent of only 20ft. Only the centre 6ft of the tangent was level, the rails being superelevated to a maximum of 2 ½ in at each end. Because the Gorton drawing office had only produced one previous Garratt design they clearly faced a considerable task.

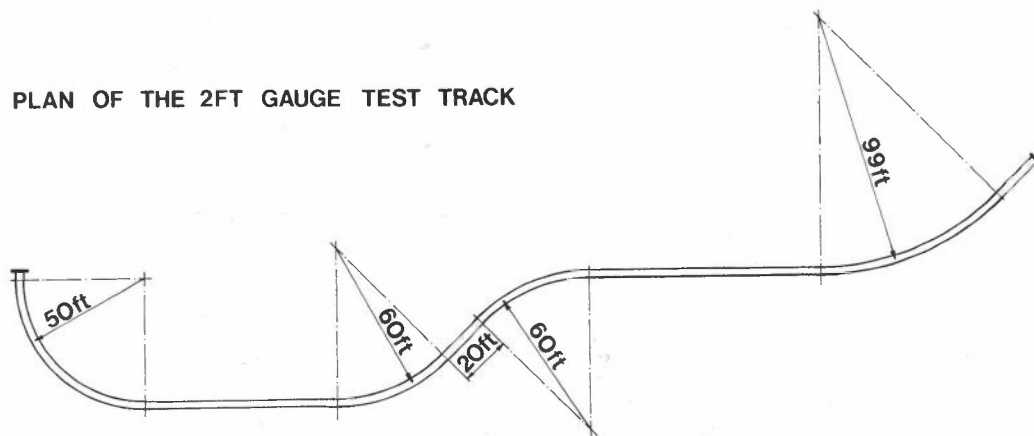
At that time the existing motive power comprised the "A" class 0-4-0 well tanks weighing 12 tons in working order, and the similar, but slightly larger "B" class weighing 14 tons in working order. These were rated to haul 50 tons up a gradient of 1 in 25, and it was intended that the Garratt should be capable of taking double this load. The axle load was limited to about 7 tons, and the usual limitations on overall dimensions combined to tax the ingenuity of the designers.

However, the locomotive which emerged from Gorton Foundry late in 1910 was the first true Garratt. Allocated the makers serial number 5407, it was carried on two four-wheel bogies with simple expansion cylinders of similar dimensions to the existing locomotives, positioned at the outer end of each bogie. These bogies had outside frames, axleboxes and springs, the axles being extended and fitted with cranks and balance weights. Slide valves actuated by Walschearts valve gear were mounted above the cylinders. The leading bogie carried a water tank, and the trailing bogie a combined water tank and coal bunker. A Klinger oil pump, driven from a rocking lever attached to the crosshead, was mounted on each bogie to supply lubricating oil to the moving parts.

The boiler was typical of the later Garratt designs, large in diameter but short in length, and carried low down on a girder frame slung between the bogies. A Belpaire firebox wrapper was fitted, with a copper internal firebox accommodating a firegrate 4ft 1 ½ in long by 4ft 3 3/16 in wide—enormous for a 2ft gauge locomotive. A pair of Drummond safety valves was installed on the steam dome, which housed two regulator valves, one for each bogie arranged to work separately or together by means of independent handles. The steam pipe to the leading bogie passed out through the smokebox in the normal manner, but that to the trailing bogie passed through the boiler backplate and down under the cab floor. Ball and socket joints were installed on the centre line of the bogie pivots to provide flexibility in the live steam pipes, and in the exhaust steam pipe from the trailing bogie. On the leading bogie the exhaust steam pipe incorporated a ball and socket and sliding joint directly under the blast pipe.



## PLAN OF THE 2FT GAUGE TEST TRACK



To meet the specified requirements for traversing reverse curves the articulated joints had to be carefully designed. The bogie pivot centres were reduced to the minimum possible with the size and location of the boiler and cab. At the leading end was a single dished pivot, but the trailing end pivot was flat, with two side bearing surfaces. This three point suspension enabled each bogie to accommodate itself to curvature and superelevation independently of the other. The boiler centre line therefore formed the chord of a circle when the locomotive was passing round curves, projecting the weight towards the centre of the curve and increasing its stability.

Water was carried in three separate tanks connected by a pipe running along the outside of the girder frame. Flexible hoses were fitted between the fixed pipe at the bogie pivots and the leading and trailing water tanks. The coal bunker was mounted above the trailing tank, with the firing plate projecting through the rear of the cab. The cab was quite simple, and clearly based on the B class. It had front and rear weatherboards with large, square spectacles, and a roof supported by pillars. Vacuum brakes, operated by a 15in cylinder, were fitted on each bogie. In addition, the trailing bogie had a screw hand brake. Link and pin couplers and curved angle guard rails were fitted at each end. It weighed 21 tons 4 cwt empty, 28 tons in working order and had a maximum axle load of 7 tons 8 cwt.

The new locomotive was tried in steam on the 21st December, 1910. To test its ability to traverse the specified curvature a test track was laid down in the yard at Gorton Foundry. It is not recorded whether the technical press were invited to attend this demonstration, but Beyer Peacock were certainly lavish in handing out information. In due course descriptions appeared in "The Engineer" and "The Locomotive", the former including the detailed general arrangement drawing reproduced here. This was the first time a drawing of the design had been published, but it was many years before another appeared. So, after the tests were completed, presumably to everyones satisfaction, the Garratt was prepared for shipment to India and left the works on 10th January, 1911.

It was added to D.H.R. stock during the half year ended 30th June, 1911 and allocated the number 31. A few years later it was designated Class D, and in 1920 was referred to as HIGHLAND CHIEF, but is thought to have carried this name only briefly. Its initial performance was disappointing. A class B could take six loaded trucks up a 1 in 23 grade on a 59ft radius curve, the Garratt only 10 loaded trucks with some difficulty. The main complaint was the inability of the boiler to maintain pressure, and a report suggested that this was due to the boiler being shorter and of larger diameter than that of the B class. The front bogie slipped frequently, and on one occasion part of the reversing gear broke, resulting in the two bogies pulling in opposite directions. Fortunately the dual regulators allowed the locomotive to be driven on one end to the nearest station for assistance, after leaving the train on the line.

Following the teething troubles of the first few months the blast was modified, but a serious pressure loss between the boiler and cylinders persisted. It was suggested that the reversing gear was too rigid and this perhaps resulted in imperfect working of the slide valves. However, the locomotive could take nearly double the load of a B class, though at a coal consumption of 106 lb. per mile compared to 40 lb. per mile. By the middle of 1914 the Garratt was out of use. A feed water heater had been fitted and reduced the tendency of the boiler pressure to drop when the injector was used. Slipping remained a problem, and the violent vibration set up necessitated frequent attention to the ball and socket joints in the main steam pipes. On 11th January, 1914, while climbing around a curve with one bogie and five four wheel trucks, and slipping very badly, one of the trucks derailed causing the locomotive to capsize. This mishap strained the boiler and resulted in leaky tubes.

The report concluded: "With a given load, cylinder and boiler power, wheel diameter and coupled wheelbase it is doubtful whether the Garratt engine as a type is as efficient as two ordinary engines on steep grades and sharp curves, because it probably requires a higher factor of adhesion on account of the excessive vibration which is set up by the double blast. The coupled wheelbase is only 4ft 3in, as against 5ft 6in for an ordinary engine; it may be advisable to increase this to 5ft 6in." Faced with such prejudices it is perhaps surprising that the Garratt continued in service for so long.

In 1914-15 two new railways, totally different in concept to the original line, were constructed by the Darjeeling-Himalayan Railway Extensions Co. The first ran south-west for 65 miles from Siliguri to Kishangunj, and was opened on 15th June, 1914. The second, the Teesta Valley line, ran north-west for 33 miles from Siliguri to Kalimpong Road, and had a ruling gradient of 1 in 50 and 100ft radius curves. It was predicted that the Garratt would be more suited to this route and should have no difficulty in hauling a 200 ton train.

In 1917 however the Garratt was reported to be working goods trains from Sookna to Tindharia, on the lower slopes of the hill section. A new blast pipe was fitted and the petticoat pipe extended down into the smokebox, which improved steaming. Further modifications were carried out in 1918-19 to correct the chief fault, claimed to be the two exhausts leading into a single blast pipe and interfering, causing the wheels of one engine to slip. The blast pipe from the leading bogie was therefore lowered as much as possible, and that from the trailing bogie brought into a separate annular blast pipe around it. The petticoat pipe was extended further down to improve the draught. Expansion joints were fitted into the steam pipes, and into the breeches pipes to each cylinder to prevent leakage. These measures appear to have cured the problems, and the Garratt was said to haul a load 65% greater than a class B. It seems to have spent most of the subsequent years on the plains section, in particular the Teesta valley line. Then, in 1948 the Kishanganj branch was converted to metre gauge, and in 1950 the Teesta valley line was severely damaged by flooding and abandoned. There was therefore little work left for the Garratt, and it was withdrawn from service on 30th November, 1954.

Although this locomotive has been described as a failure it did give many years of useful service, but this followed a lengthy period of modifications when its reputation was probably blackened for all time. In assessing its worth the special conditions on the D.H.R. should be considered. The B class was the largest 0-4-0 locomotive the line could accommodate. They had the maximum axle load, large cylinders and a long wheelbase for stability. Beyer Peacock produced a Garratt which was essentially equivalent to two B class, so why did it fail to produce the expected performance?

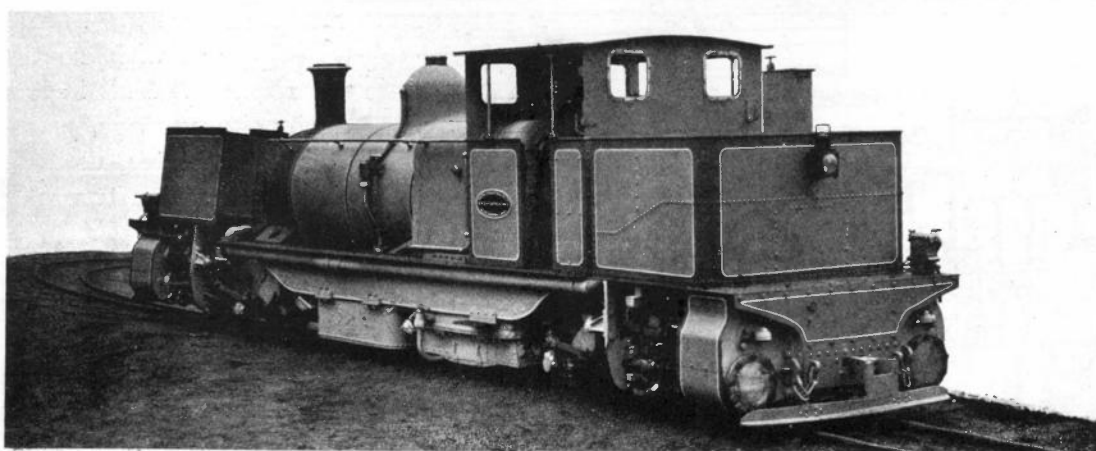
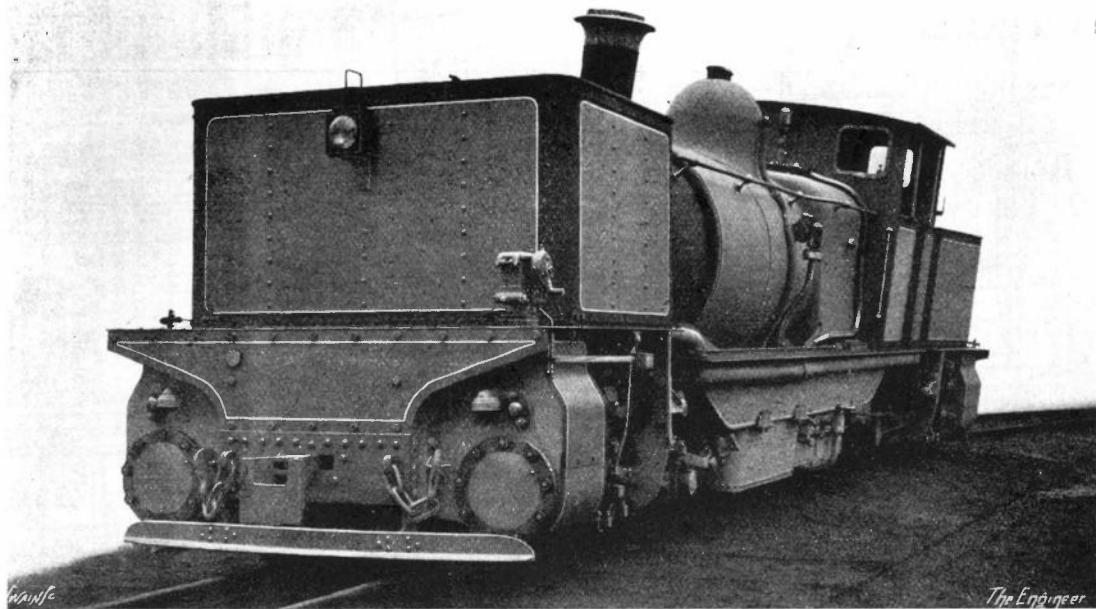
Rodney Weaver suggests that perhaps the designers did not consider flange friction, an important factor on very sharp curves. If the Garratt was developing its maximum tractive effort while hauling a train, and the leading vehicle was a standard passenger coach, the lateral force on this coach rounding an 85ft radius curve would exceed 4500 lb. This represents something over 500 lb flange friction, and weight transfer from the outer wheels of more than a ton! Because the total resistance of the vehicle, even on a 1 in 25 gradient, would be little more than 500 lb it is clear that the flange friction is an important factor in determining train loads. Further, the resistance of a train due to curvature is a function of its length and the radius of the curve, so that doubling the length of the train increases flange friction considerably more than the 100% one would normally expect. On the D.H.R. a rough calculation suggests that doubling the tractive effort would only permit a 50% increase in train load. This approximates closely to practical experience.

Weight transfer resulting from increased flange friction, if more than a ton, could overturn a light vehicle at the front of a train. This danger would be more pronounced with a badly-loaded or poorly-sprung wagon, and this combined with the fluctuating tractive force during slipping is undoubtedly what caused the derailment in 1914. It is significant that the only known photograph of the Garratt in action shows two heavy steel bogie wagons at the front of the train.

Some minor faults were to be expected with a relatively new design, and perhaps the D.H.R. staff did not have the expertise or motivation to attend to these quickly and effectively. A.E. Durrant, author of "The Garratt Locomotive" (David & Charles, 1969), commenting on the performance, attributes the serious drop in pressure when the injector was used to a boiler of insufficient capacity, or not steaming properly. The latter is more likely, but seems to have been corrected by blast pipe modifications. The suggestion that the exhausts interfering with each other caused slipping is unrealistic, in fact any interference would increase back pressure and reduce the tractive effort. The Garratt was fitted with a large sandbox front and rear, and steam sanders, but the D.H.R. is subject to slippery rails and this was probably not so effective as two men on the front of a B class. Steam pipe joints were a problem with all early articulated locomotives, and slipping would aggravate any faults. One reversing lever, and later one regulator, was standard practice on Garratts so that they could be handled like a normal locomotive. However, it is possible that the reversing gear was not entirely suitable, and it is significant that Beyer Peacock later developed a very effective steam reverser.

Finally, the D.H.R. has always been operated on the basis of small trains, duplicated as necessary. Fitting one long train into a regular pattern would certainly be unpopular with the operating staff, especially where there are reversing stations. There have been many locomotives which excited engineers or enthusiasts, but were roundly condemned by those who had to move traffic with them. Perhaps the Darjeeling Garratt was just another of these misfits.

The author acknowledges the assistance of the following in providing information incorporated in this article: M.C. Foster, Managing Director of Morgan-Grampian (Publishers) Ltd. for permission to reproduce material from "The Engineer"; North Western Museum of Science & Industry, Manchester, holders of the Beyer Peacock records; F.C. Hirst for the loan of an early edition of "Railway Wonders of the World"; and N.G.R.S. members "Dusty" Durrant, Hugh Hughes, Andrew Neale, Michael Satow, and Rodney Weaver.



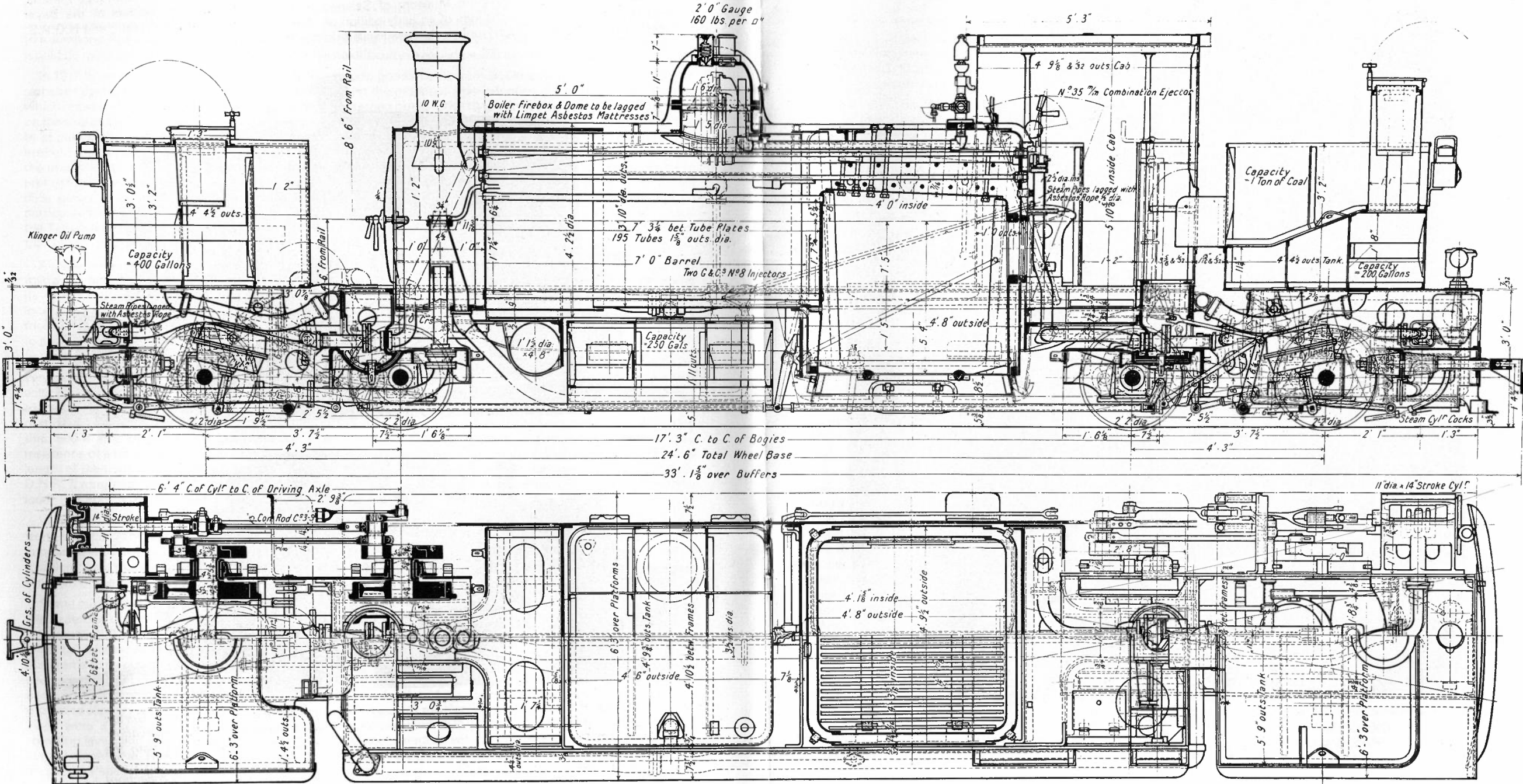
*Two views of the Darjeeling-Himalayan Railway Garratt on the special test track at Gorton Foundry clearly showing how well it accommodated reverse curvature and superelavation. The locomotive is standing on the tangent between the two 60ft radius curves, with the leading and trailing wheels actually on the curved track.  
(Upper: Courtesy "The Engineer")*

*(Lower: F.C. Hirst collection)*

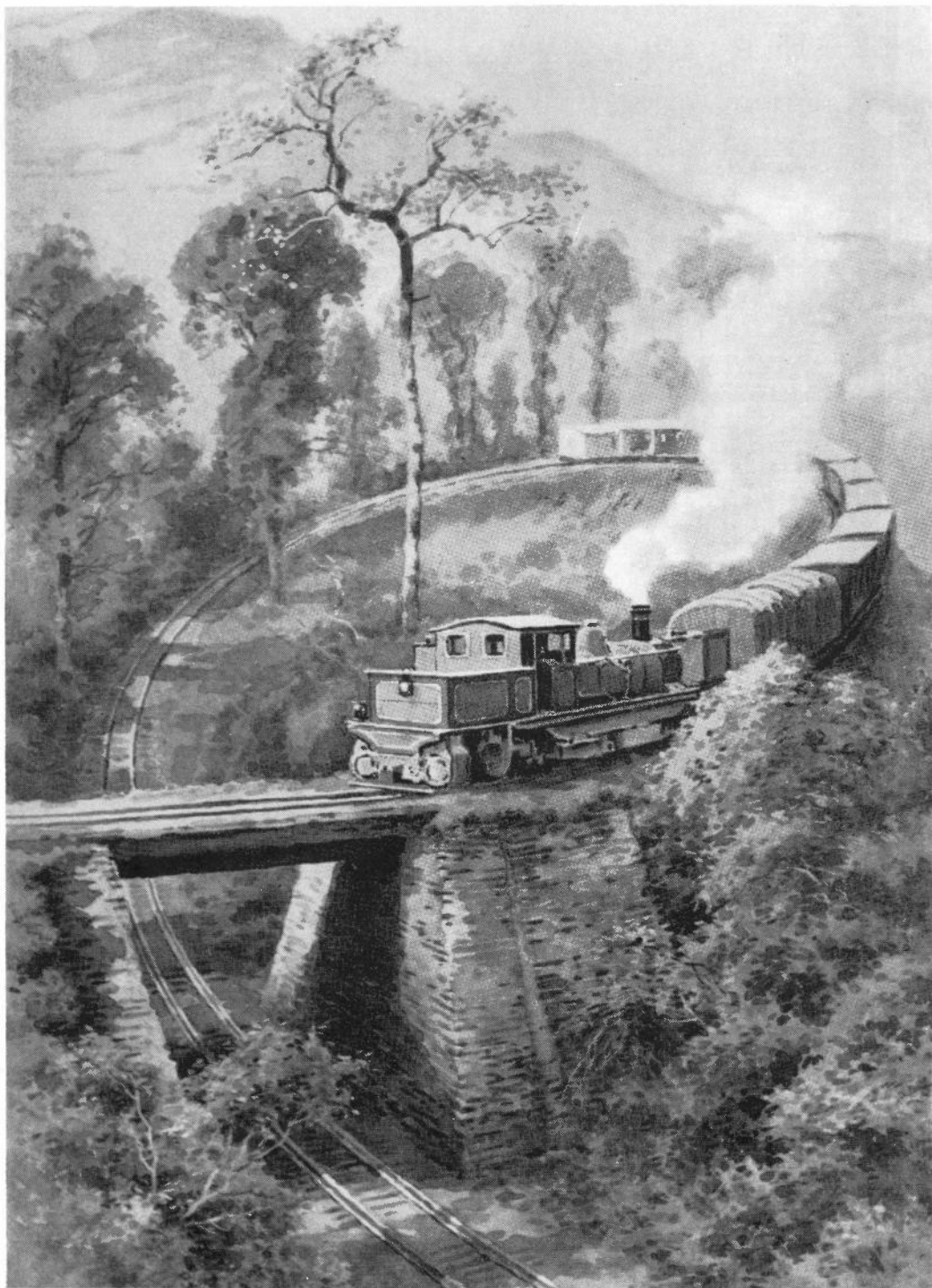
# GARRATT LOCOMOTIVE FOR THE DARJEELING-HIMALAYAN RAILWAY

BEYER, PEACOCK AND CO., LIMITED, MANCHESTER, ENGINEERS

(For description see page 240)







*This stylised view of the Garratt rounding Agony Point on a goods train is clearly based on the only known photograph of it working on the hill section. The original painting is reproduced in colour in "Railway Wonders of the World".*

*(F.C. Hirst collection)*

# TWENTY YEARS ON THE ISLE OF MAN RAILWAY, 1957-1977

Christopher White

The Isle of Man Railway was unique in these islands as a self-contained steam worked railway which continued to operate until 1965 in much the same way that it had done since its opening over ninety years earlier. Add to this the Douglas horse trams and Manx Electric Railway, also unique survivors of an earlier age, Manx hospitality and countryside, and it is only surprising that more railway enthusiasts have not braved the Irish Sea and made the journey to this island kingdom.

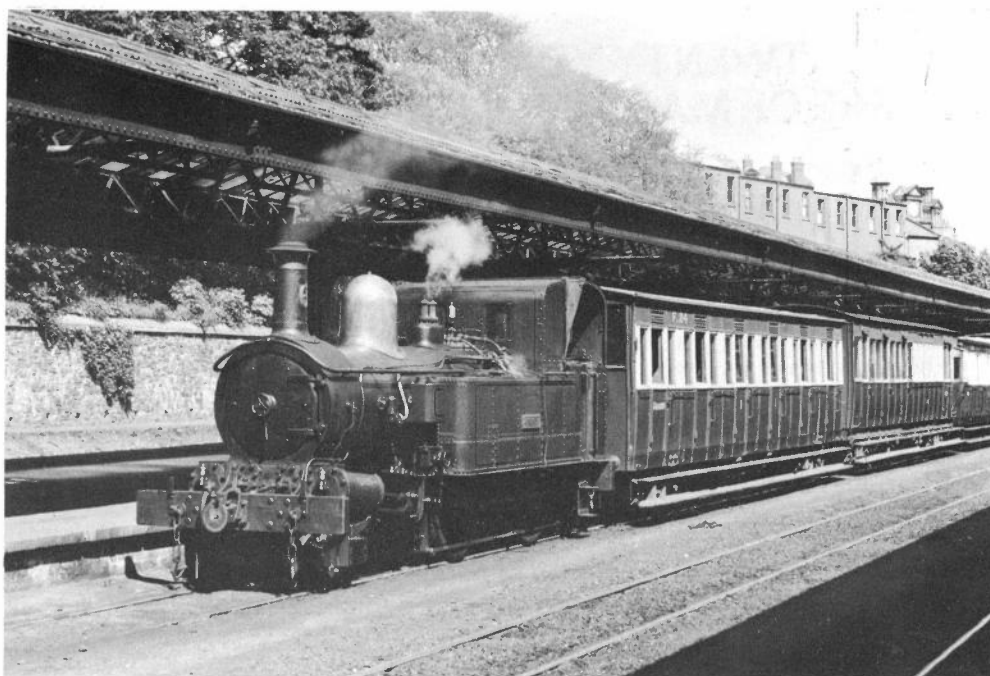
Even in 1977 you could ride from Ramsey to Port Erin and back on the 3ft gauge and enjoy electric, horse and steam motive power—a total distance of some 34 miles each way. Add to that the unique Snaefell Mountain Railway climbing to over 2000ft from Laxey and the struggling Ramsey Pier Tramway and you have enough for the most critical enthusiast to enjoy. In 1977 all this could be accomplished on a £5 weekly runabout ticket.

This article concentrates on the Isle of Man Railway during the years 1957, 1967 and 1977, tracing the decline of the steam railway in those years to the all time low of 1965 when no steam trains ran. In 1975 one locomotive trundled a few carriages along the almost level track between Port Erin and Castletown in the far South. In 1976 although a few miles were added to the steam run the Manx Electric Railway lost its winter services and the section from Laxey to Ramsey. The 1977 was the year of the phoenix, with restoration of full summer services on both lines. At the time of writing the plans for 1978 are uncertain.

In 1957 of course, the railway was still operating throughout the year; the main traffic in winter being schoolchildren between Peel and Douglas, and Kirk Michael and Ramsey, and some parcels and general goods traffic. The timetable for 7 January 1957 shows that the Railway was active from 6.45am to 6pm. There were three trips on the south line: in theory they could be worked by a single locomotive based at Port Erin, but the chances are that a Douglas engine was steamed for shunting in the morning and worked the 2.00pm trip from Douglas to Port Erin and back. The trains on the northern lines would be operated by three locos, stabled at Peel and Ramsey. Several permutations are possible and are known to have been worked at various times over the years so it is impossible to be certain if there were two at Peel and one at Ramsey or vice versa. My opinion is that there were two locos at Peel and that there was a light engine from St Johns to Kirk Michael at 7.35am and from Douglas to Peel at 5.30pm. These light engine workings were quite a feature of northern line timetables in this period and reflect a bizarre state of affairs in that the line with the heaviest traffic on the northern lines needed three.

However, things balanced out later in the year and at the height of the season three locos were at work on the south line with seven trains in each direction, while the five trips on the northern lines were managed by the three locomotives with the exception of the 2.10pm. Douglas to Peel and return which was worked by the Douglas Station pilot or another spare Douglas engine. When traffic was heavy on the northern lines one of the larger Douglas engines might take the main train out to Ramsey in the morning leaving a northern line loco behind at Douglas to act as station pilot and banker. We may say that eight locomotives would have been at work to operate the service. The number of carriages in use is much more difficult to estimate so much so that the saloon carriages 29, 30, 31, 32, 35, 36 and 75 were reserved for use on Sundays between Douglas and Kirk Braddon in connection with the open-air Church Services. After the service was over the railway operated a major publicity exercise with several Inspectors stationed between the Church grounds and the Douglas Corporation bus terminus. People were enticed by the cry "Train to Douglas", handed leaflets extolling the Railway services, and shepherded through a narrow gate by the side of the Railway bridge, down a sloping footpath to a Booking Office, only open on Summer Sundays, and into this train of luxurious carriages—quite unlike the rather tatty and run-down specimens quite frequently making up the week-day trains!

Besides these seven carriages which were usually kept in the Douglas carriage sidings the south line had need of three trains, one based at Douglas and two at Port Erin—the basic Port Erin sets would be quite modest, probably three carriages each to which spares would be added as required—thirty carriages would be a very generous allowance. On the northern lines the situation was more complicated. The basic sets would have been but two carriages; thus the first arrival at Douglas would comprise two from Peel and two from Ramsey and these would leave again at 11.50. These were probably the only turns worked by the Ramsey carriages thus



*Douglas station about 1958. No.6 PEVERIL waits to leave for St. Johns with a combined train to Peel and Ramsey (R. Brook)*



*The complicated ritual of dividing the train at St. Johns. No.8 FENELLA draws the Ramsey portion forward into the platform, No.6 waits on the main line to take the Peel portion. (R. Brook)*

leaving the 10.15 Douglas to Peel and the 10.30 to Ramsey to be formed by Douglas based carriages, say five each. A further set of carriages would be needed to form the Ramsey portion of the 2.10pm from Douglas, and these would be formed by the 10am from Ramsey, a train made up of two or three carriages. In addition carriage 39 was in the shed at St Johns ready to form the Foxdale train as it always had, (even though the passenger service was withdrawn in 1942) and one carriage was based at Kirk Michael for the school train. This seems to imply 18 carriages but there were probably as many again spare, some of which may have seen only very occasional use.

The conclusion reached tallies with observation that all the 75 bogie carriages were available for service, and by the relaxed management standards of the time were probably required even if many of the number were very lightly used. Even the six-wheelers at St Johns were stored in the open as though ready to go if there was a sudden rush of traffic.

It also has to be remembered that both the locomotives and carriages were primitive and that the maintenance facilities were also extremely dated in every department. For example Douglas workshops possessed no welding equipment and drilling and rivetting was the order of the day. Routine oiling of the carriage axle boxes could only be done by the removal of the axle box covers, a very time-consuming business.

Operation of the railway at this time was a joy for the enthusiasts. Right up to the end of Company operation at least four locos were in steam at Douglas from 8.30 until the main departures between 10am and 10.45. These consisted of two trains for Port Erin and one each for Peel and Ramsey. A banker would be available and would bank the 10am up to Port Soderick and then return in time to perform the same function for the 10.30. Meanwhile the station pilot would be pottering in the goods yard shunting wagons for the 11.45 departure to Port Erin and 11.50 to Peel and Ramsey. Certain trains were booked to convey goods traffic. The 10.30 from Port Erin, the mid-day departures, and the 3pm arrival from Peel and Ramsey did so regularly. This made a lot of work for the station pilot.

Outside Douglas, interest centred on St Johns where trains divided and combined in various combinations of carriages and wagons and much fly shunting of wagons took place. The vacuum brake pipes on the carriages were faithfully coupled up but never used and this meant that coupling and uncoupling could be carried out very quickly.

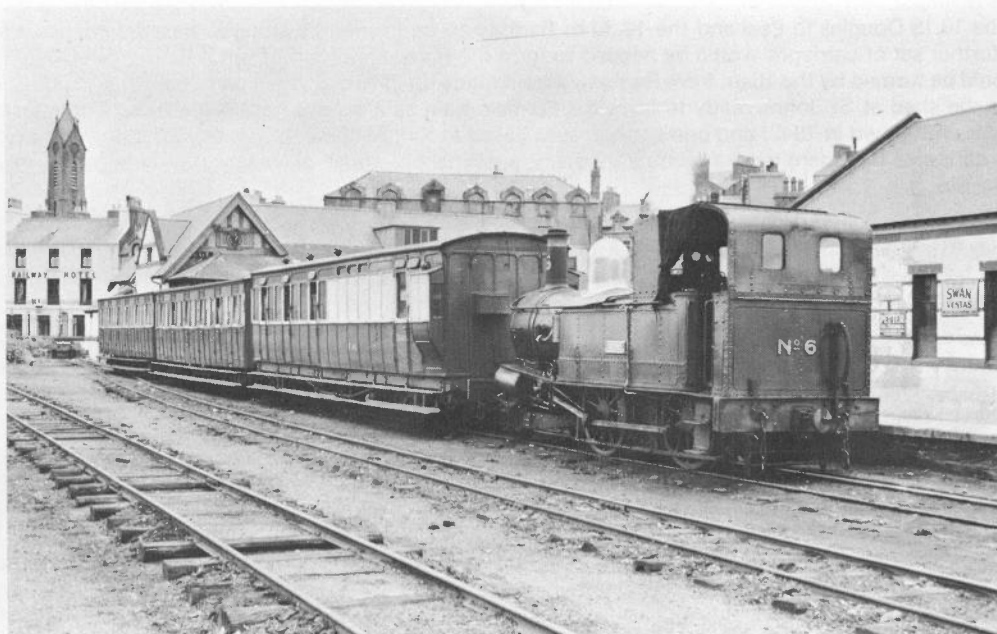
All the unique features of the Isle of Man Railway were to be observed in daily use; the distinctive whistle signals, the hand signals used by the staff, the white flags displayed from trains and at certain level crossings, the "rolling pin" staffs and paper tickets, the varied collections of signals, the races from Douglas and St Johns, frowned on by authority and deliberately avoided by the timetables, but who minded five minutes late for the sake of a race of which the outcome was predetermined by the gradients?

These and much more gave the Isle of Man Railway of 1957 and the next few years a unique fascination—a railway doing what it had been built to do with much of its original equipment intact. There were still plenty of passengers (though never enough); schoolchildren; grandfather clocks and household effects on the platform at St Johns; vans full of soap powder sent out from Douglas; parcels from all over Britain and kippers in the vans. Finally there was the smell of hot oil and steam mixed with the lingering odour of the gas works waste used as weed-killer which pervaded all. It was too good to be true and in the harsh climate of the sixties too good to last.

The end came suddenly although not unexpectedly. The decline is most evident from a perusal of the winter timetables, for every summer the railway blossomed again, but not always quite so profusely as the previous year. I travelled on the 6.45 from Ramsey in the summer of 1959 for the first and last time—it was replaced by a bus by December of that year, and at the same time the Peel-Douglas school traffic went. The Ramsey to Kirk Michael school service survived the beginning of term in September 1961 but was replaced by a bus from 25 September. In November 1962 the only services worked were 10.15 Douglas to Peel; 11.10 Peel to Douglas; 12.20 Douglas to Port Erin and 13.35 Port Erin to Douglas. This was the all time low, however, for later winters show two trips, morning and afternoon on the south line and a mid-day working to Peel and back.

The final summer timetable (1965) showed six return trips on the south line, two trips to Ramsey and four to Peel. This was an improvement on some previous summers which had departures from Peel to Douglas at only 14.25 and 16.25. The improvement was due to the breakdown and withdrawal of some steam locomotives and the use of the former County Donegal railcars on the Peel trains. Even at this time there was enough work for a banker and station pilot at Douglas and this loco also worked the 12.00 and 15.25 to Peel. Locos 10, 11 and 12 shared duties on the south line and 5 and 8 struggled with the Ramsey trains. Many trains were lightly loaded outside the peak departures from Douglas and wise passengers tried to catch the earlier trains back to be sure of arriving in time for high tea served in Douglas at 5.30 or 6.00. The 15.45 from Port Erin and 15.40 railcar from





*Peel station with the Railway Hotel prominent in the background. No.6 PEVERIL on the 1.15p.m. to Douglas in June, 1955. (H. Ballantyne)*



*Beautifully finished in apple green livery, No.5 MONA contrasts sharply with the dilapidated loco shed office at Peel one summer day in 1967. (A.C. White)*

Peel, for example, tending to load more heavily than the 16.10 from Port Erin and 16.25 from Peel. Ramsey passengers were not due into Douglas until 17.15 and this train ran five minutes later until 21 July. Was this really for the schoolchildren or was it just that it had always been timed for the school during termtime and tourists during the school holiday?

In 1966 no trains ran. 1967 was the first year of the Ailsa regime. It is difficult to write fairly of this era: on the one hand much that was valuable was destroyed or vanished for ever; on the other hand two locomotives were re-boilered and the trains were kept running. An ambitious time-table was planned with no less than nine workings between Douglas and Peel, three workings to Ramsey and four workings daily between Douglas and Castletown, the line further south being unfit for use owing to the laying of a gas main along the railway right of way.

Sunday services were re-introduced and brave attempts were made to generate excursion traffic. However, all was not well. The staff were discontented at being asked to work much more intensively than they had been used to, one man commenting "The engines haven't got time for a pee, let alone the men". The situation was not helped by the fact that the two best locos were out of order for some time after a head-on collision in the vicinity of Union Mills. A return Ramsey excursion was de-railed at the same station late at night on the unlocked facing points and a bus had to be sent to rescue the passengers. Cancellations and delays were frequent, and this coupled with the missing part of the south line and the general air of chaos were not conducive to the tourist who still treated the Isle of Man Railway as a means of transport rather than an attraction in its own right. Many imaginative moves were made such as the issue of inclusive travel and lunch tickets to Ramsey, and this produced some very good loadings. The saloon carriages were used for these special trains and the crews worked manfully to keep their trains to time but the state of the track and the congestion between St Johns and Douglas were against them.

In this period the locomotives were repainted apple green instead of the indian red they had sported since 1950. This was a great improvement and so was the spirit of optimism for the future. However, while the locomotives were preserved, various carriages and many of the smaller fittings of the railway were destroyed and dispersed in the following ten years.

The spirit of 1967 was undoubtedly one of great enthusiasm, and any criticism that lovers of the IMR had about the way things were being done, about the lack of maintenance, about the operating standards, about the theft and vandalism of the Company's property, were quieted by the fact that trains were operating again and by the promise that seemed to hold out the continued operation of the whole system. It is a matter of history that this promise was not, indeed could not, be fulfilled because of the harsh economic realities of operating the northern lines and these closed in September 1968. In the earlier part of this article I have indicated the difficulties that faced the old Company and the disproportionate investment in locomotives, carriages and manpower that had to be made to keep these lines (and particularly the St Johns to Ramsey section) operating at all and circumstances were no different under the Ailsa regime. Traffic between Douglas and Peel has never been very heavy and while it would have been most interesting to see the effects of working just the Peel line and the south line this combination was never tried.

The 1970's have seen a further gradual decline in the railways fortunes. Kept alive from year to year by one expedient after another—which have all ended up by putting Manx taxpayers money into the pockets of the shareholders of the Isle of Man Railway Company—the service declined to the operation of one locomotive and four or five carriages between Port Erin and Castletown in 1975 with an extension to Ballasalla in 1976. This was a comedown indeed with the railway really being operated as an adjunct to the new Railway Museum at Port Erin. In the same period unsuccessful attempts were made to sell the passenger station, loco and carriage sheds and workshops at Douglas and all the stores were at one time moved out of Douglas. The stock of five workable locomotives finally inherited from the Ailsa regime seemed overmuch for a line that only ran one engine in steam. The wholesale destruction of the wooden carriages has resulted in a reduction from 75 to 37 units—some of these are in a very poor condition and hardly likely to run again. In 1968 the scrappers first arrived, and eleven former four wheel pairs were taken off their bogie underframes and burnt. Then in 1975 a fire in the St Johns carriage shed destroyed a further eleven carriages. Another fire in 1976 put paid to four more. Two carriages have been withdrawn from use and are in the Port Erin museum along with one of the Manx Northern Railway six-wheelers which is privately preserved in MNR livery. The working carriages have been reasonably maintained during the period, with several re-upholstered and general repairs and underframe maintenance continuing although on a reduced scale in line with the railway's reduced circumstances.

The trackwork on the Isle of Man Railway has long been a source of wonder to the visitor. This is partly because the old method of ballasting is used with the ballast packed up to the top of the sleepers—and the base



*A peaceful scene at Ballasalla about twenty years ago. The driver of No.12 HUTCHINSON passes the time with the stationmaster.* (N.G.R.S. Library)



*In 1976 services operated only between Port Erin and Ballasalla. On 12th July No.11 MAITLAND takes water at Ballasalla surrounded by a group of admirers.* (D.H. Smith)

of the rails. Even today there are considerable numbers of half-round sleepers in use with a slot adzed out for the rail. In many places the rails are very worn and track work is completely un-mechanised. A considerable number of sleepers were obtained recently but it has to be said that most of the maintenance has been on a make do and mend basis for very many years. The same can be said about the fencing and hedges, although a mechanical hedge cutter is employed. The mild climate of the island leads to a lush growth along and over the track, and long grass right up to the rails leads to adhesion problems on damp days. In recent years chemical spraying of the track has been tried and this has had some effect especially between Ballasalla and Port Erin. After two years of almost total disuse the Ballasalla to Douglas section was very overgrown and considerable efforts had to be made on clearance work in the early months of 1977.

The 1977 season was from 15 May to 23 September with trains running daily except Saturdays. Five locomotives were available for service; 4, 10, 11, 12 and 13; and about twenty carriages. The timetable showed departures from Douglas at 10.10, 11.45, 2.10 and 4.10, and from Port Erin five minutes later with all trains booked to cross at Ballasalla. During a visit in June locos 11 and 12 were in use and everything was running reasonably efficiently although the morning train from Port Erin was forty minutes late into Douglas one wet day owing to slipping on the bank up from Ballasalla and the crossing of the mid-day workings took place at Port Soderick as a result. The return fare for the full journey was £1.50 with a weekly ticket at £3 also available for the first time for many years. At the end of the season a Railway Company spokesman described it as a good season with 81,528 passenger journeys made, revenue £40,200 and operating loss £41,000.

The Isle of Man government subsidised the operation of trains in 1977 as in previous years, but the Isle of Man Railway Company paid a 20% dividend on Ordinary Shares in 1976, largely from the sale of assets and astute management of the capital received. In these circumstances the Transport Steering Committee of Tynwald asked if the Railway Company would be prepared to sell and received an affirmative reply. A market valuation of the relevant assets was prepared and this came to £268,500, a large sum but considerably less than the IMR Company's own valuation. So the uncertainty about the railway's future continues just as it has for over twenty years. The only advice that can be given to the enthusiast who has not been to the Isle of Man is go as soon as possible—and above all ride on the trains and the Manx Electric Railway as well. It is well worth getting the Isle of Man Steam Packet Co. literature well in advance and studying details of the various excursion fares especially if only a short visit is planned. September I have found a particularly good month for bargains.

It is ironical that in this situation there should be two preservation societies interested in the Isle of Man Railway.

The railway has not been an easy line to support and it has been evident from the 1965 closure that no voluntary group could hope to raise the capital to purchase the line and make the necessary investment in replacement or modernisation of worn and outdated equipment. Such practical work as has been done has always been in the knowledge that it might all be in vain if a political or financial decision in Tynwald went against the line, and indeed that done on the Peel and Ramsey lines was wasted in just this way. However, both the societies have made a contribution to keeping the wheels turning and one now seems to be concentrating on museum exhibits and the other on practical improvements at stations and along the line. This is perhaps not a bad thing for both are still badly needed in spite of progress so far made.

Against all the odds, trains have kept running on at least part of the Isle of Man Railway and it is to be hoped that these will play their part in revitalising the islands tourist industry as they did in building up its prosperity during the last century.

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**A MINIATURE RAILWAY FOR THE SULTAN OF MOROCCO:**— In 1888, the King of the Belgians presented the above ruler with a miniature portable railway locomotive, engine and carriage seating twelve persons. The track had a gauge of 0.600m (about 2ft) and a section of 5 metres weighed only 80 kilos (say 160 lb). The locomotive was of 4 H.P. and could haul the car at a speed of 9 miles per hour; it was constructed entirely of steel and phosphor-bronze to serve strength and lightness. The fuel used was wood, hence a diamond-shaped smoke stack with spark arrester was fitted. The weight of the engine with fuel and water was 1400 kilos. The locomotive was named "Occident", inscribed in Arabian characters, and was intended for the personal service of His Highness. (*"The Locomotive Magazine"*, March 15, 1926).

**AVONMOUTH DOCKS:**— Messrs. Peckett & Sons, of Bristol, shipped the first locomotive from the New Docks since their opening by H.M. the King last month. The engine was bound for New Zealand. (*"The Locomotive Magazine"*, January 15th, 1910).



## VINTAGE DAYS AT RAVENGLASS



Two views of the Ravenglass & Eskdale Railway's principal motive power in the summer of 1928. The upper photograph shows the three steam locomotive rebuilds outside Ravenglass shed—from left to right are RIVER IRT (newly rebuilt from MURIEL), the original 4-6-6-4 RIVER MITE built on the frames of SIR AUBREY BROCKLEBANK and COLOSSUS, and RIVER ESK, then fitted with an eight coupled Poultney tender. In the lower view RIVER MITE is on the turntable with ICL No.2 (rebuilt from ELLA), RIVER IRT and RIVER ESK to the left. (collection R.N. Redman).

# EARLS BARTON SILICA CO. LTD.

S.A. Leleux

The Birmingham Locomotive Club, Industrial Locomotive Information Section (now the Industrial Railway Society) published "*Industrial Locomotives of Eastern England*" in 1960, and this led me to visit more of the railways near my home in Northampton. There was no need to hurry, these lines would always be there to see. Such was the optimism of youth and inexperience! So, one sunny afternoon at the end of April, 1962 (was it really fifteen years ago), I cycled the seven or eight miles to the village of Earls Barton. The book promised 2ft gauge Lister petrol and Orenstein & Koppel diesel locomotives, types unfamiliar to me.

The silica works stood at the end of a short lane to the east of the village. A gantry for loading road lorries projected over the lane, and behind were rusty corrugated iron buildings. These contained pug mills—heavy rollers rotating in a circular pan—where the silica sand was ground and mixed with clay from Cranford. Apart from a bicycle leaning against a wall there was no sign of life, but on further exploration I heard noises coming from a long, low brick building at the far end of the yard. Within this building, used for storing and drying materials before grinding, were two dark green Orenstein & Koppel diesel locomotives. Two men were trying to start one, without much success. One man lit a piece of blue paper and, when it was glowing well, dropped it into the cylinder through a hole in the head. He then quickly screwed a plug into the hole while his mate rapidly turned the starting handle. If nothing happened within a few seconds the plug was removed and the procedure repeated. Eventually the engine fired and the locomotive chugged out of the shed.

Four side-tipping skips were collected and propelled past the shed to the quarry, where the train halted beside an excavator. The loco driver started up the excavator, filled the skips, then drove the locomotive and loaded train back to the works. The accompanying sketch shows the track layout here, and although there was no loop the locomotive had to run round the train to propel it up to the high level tipping dock. The train was therefore stopped just short of the incline points, the locomotive uncoupled and run forward for a few feet onto the incline track. The points were changed and a wire rope with a hook on each end was fastened to the locomotive and the back of the first skip. When the locomotive was driven slowly forward its train ran on the adjacent track. I have no notes to confirm this, but photographs indicate that two skips were first propelled up the incline, tipped, and returned to the lower level before the second two skips were tipped. I suspect that a similar procedure was used to run the locomotive round the empty wagons, although again I have no notes.



*Cable shunting in progress at the foot of the incline in July, 1965. Motor Rail 8731 is in the process of running round the skips it has brought up from the pits. The drying shed can just be seen on the right of the track heading towards the quarry in the distance. (S.A. Leleux).*



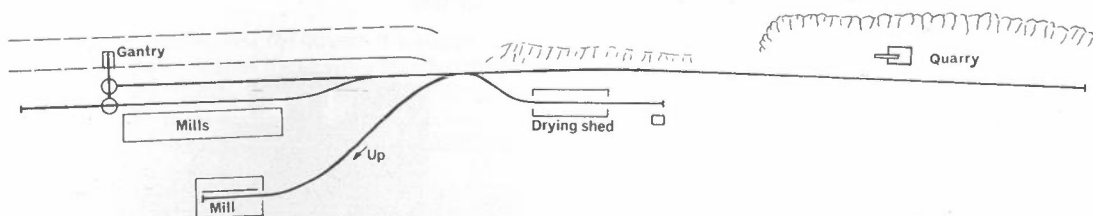
*Orenstein & Koppel 7595  
leaves the quarry with a  
loaded train in April, 1962.  
(S.A. Leleux)*



*The first Ruston & Hornsby  
diesel locomotive, BIG  
TOM, out of use behind the  
drying shed in April, 1962.  
(S.A. Leleux)*



*This surviving Lister was  
almost hidden by weeds as  
it lay derelict in April 1962.  
(S.A. Leleux).*



On this occasion the working locomotive was Orenstein & Koppel 7595, a single-cylinder machine recorded in the book as having arrived from Wm. Jones Ltd., the Greenwich dealer. The other Orenstein & Koppel, 8650, was recorded as from M.E. Engineering Ltd. in July 1958. Two other locomotives lay derelict on a siding behind the drying shed. First was a Lister type RT 10063, delivered new from the manufacturer in 1938, but now a rusty ruin deep in the weeds. The legend "Haulage Capacity 30 tons on the level" was no longer meaningful. I begged the plate, which one of the men quickly removed with a hammer and chisel. Behind it stood a Ruston & Hornsby with a two-cylinder 10 h.p. Lister diesel engine, now in a shabby pale blue livery with the name BIG TOM crudely painted in red across the front of the water tank. This was Ruston & Hornsby 163997, their first diesel locomotive built in 1931, recorded as arriving here from the Earls Barton Sand & Gravel Co. Ltd. I learnt that it had been out of use since 1958, and although it had no cab, I did discover a very rusty "keyhole" cab, still carrying the circular Ruston & Hornsby transfer, lying in the bushes during a later visit.

Twelve side tipping skips built by Allens of Tipton, their "Eezetip" design, were in use, and a further six lay derelict about the works. The track around the works and out towards the quarry was in 18ft lengths on steel sleepers, but on wooden sleepers in the quarry. Some time after this initial visit I joined an accountant who carried out work for many of the local cooperative societies. I therefore had the opportunity to visit a number of industrial railways during my lunch hour, and in July 1964 walked up from Earls Barton to the silica works to see what changes had occurred. My first surprise was the appearance of a light green Simplex diesel locomotive, Motor Rail 8731 built in 1941. This had apparently been obtained from the manufacturer in 1963. BIG TOM, the Lister and Orenstein & Koppel 8650 had gone, sold some three months earlier to the local scrap merchant, W.J. Redden at Little Irchester. Spares for the remaining Orenstein & Koppel were expensive and difficult to obtain, so its role as spare engine was uncertain. Five Hudson skips with lifting trunnions at each end and simple legs to allow the body to be lifted by a crane and placed on the ground were also at the works. These, together with a quantity of rail, had been obtained from Bedford Corporation Waterworks. Realising that the O. & K. would probably not survive I hurriedly made a dimensioned sketch. During the afternoon I realised that I had missed a major item and had to dash back at the end of the day to correct this omission!

A year later the Orenstein & Koppel had been relegated to the back of the drying shed where it remained, increasingly becoming immersed in the undergrowth in a similar manner to its two predecessors, until removed for preservation by Alan Keef about November 1971. In its place was a second Simplex, 4813 built in 1937. This was painted red with black engine covers, but under the paint could be discerned "Bedford Corporation Waterworks". I recalled having seen it working on a sewer contract for Conduit Construction Co. at Wellingborough. Both locomotives were in service, probably one in the quarry and the other at the works, hauling and shunting trains of six or eight skips.

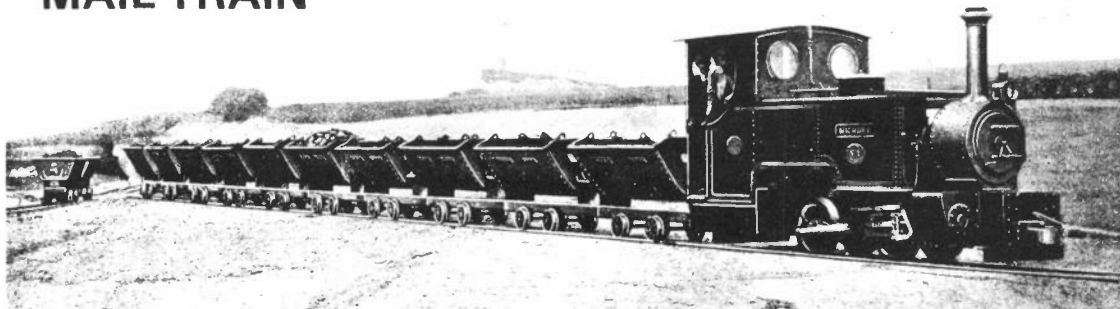
Shortly afterwards I left Northampton, and it was August 1969 before I visited Earls Barton again. The works had closed the previous October and a fitter told me that the local gravel pit operator, Mackeness Aggregates Ltd. (now Mixconcrete Aggregates Ltd.) had bought the locomotives. The newer one had gone to a new pit near Warwick, which I later learnt was Charlecote, but 4813 remained in the open with nine skips and the Ruston cab. I believe it later went down the road to Earls Barton gravel pits.

I never discovered when the works started, but suspect that it was during the mid 1930's. However, the silica beds were above a layer of ironstone worked by the Earls Barton Ironstone Co. Ltd. until 1921, and could have been established at any time after that date. I never saw the earliest Lister petrol locomotive, also from the Earls Barton Sand & Gravel Co. Ltd. which was disposed of about 1953 according to "Industrial Locomotives of Eastern England".

*(I am informed by Eric Tonks that Motor Rail 4813 was sold to Conduit Construction Co. Ltd. by J. Redden & Sons Ltd. in 1964. As Earls Barton Silica obtained some Bedford Corporation Waterworks track and skips in 1964 it would seem likely that Redden's bought the whole Bedford Corporation Waterworks system for scrap after its closure in 1962 and subsequently found customers for the best of this material. I too have happy memories of several visits to the Earls Barton system, and it seems tragic that no move was made to try and save BIG TOM, the very first Ruston diesel, particularly as all three locomotives lay in Redden's yard until about 1967 before finally being cup up. — AN )*



# MAIL TRAIN



## STEEPEST ADHESION WORKED GRADIENTS FOR NARROW GAUGE PASSENGER TRAINS

Neither the SLGR nor the Plynlimon & Hafan can claim to be the steepest non-funicular railway; that distinction is held by the Pilatus Railway with a maximum gradient of 1 in 2. Presumably for "non-funicular" (i.e. not worked by rope) one should read "adhesion worked", but even so neither is a remote candidate. The steepest public railway worked by adhesion alone has a gradient of 1 in 13¾; this is the MOB in Switzerland which has a lengthy stretch at this inclination on the climb out of Montreux. Also in Switzerland there is the Bernina Railway with long stretches at a ruling gradient of 7% (1 in 14.2). 1 in 22 on the SLGR is by comparison almost main-line standard—indeed the Southern Railway (USA) had just such a gradient on one of its principal lines at Saluda, North Carolina.

The steepest gradient on any railway worked by adhesion is undoubtedly steeper than 1 in 10 and would have been found on an American logging line. I have seen photographs of a reputed 1 in 6 worked by Shays but I think that claims for 1 in 8 gradients are probably nearer the mark.

**KENILWORTH, WARWICKS.**

**RODNEY WEAVER**

## GEORGE GUNDRY'S COLLECTION

With reference to the first picture in this photo feature in NG 77 the Tramway d'Annecy a Thonex was opened on 1st September 1898, and closed in 1930—I do not know the exact date. Its locomotives were all built by Buffaud et Robatel.

**NEWCASTLE, STAFFS.**

**E. K. STRETCH**

## STANLEY BATTISON'S LOCOMOTIVES

The locomotive in the lower illustration on p 27 of NG 78, DUCHESS OF ILKESTON, looks remarkably like one shown in a photograph in R.H. Leithead's 1975 *Miniature Railways Stockbook & Guide*. The photograph was taken in 1963 and shows a locomotive named INGOLDMELLS FLYER operating on the Ingoldmells Miniature Railway.

**MICKLEOVER, DERBY**

**R.N. JONES**

## SAND RAILWAYS OF LEIGHTON BUZZARD

In our article in NG 78 we list BROWN JACK (4wDM MR 7148 of 1936) as possibly still surviving at Churchways shed but it appears this is no longer so. The last time I actually saw BROWN JACK it was lying out of use in the scrap siding next to Eastern Way workshop. This siding was cleared by a scrap dealer early in 1976 so it probably went then but I would be grateful if anyone could confirm or deny this. When I checked recently there was no sign of any unidentified locomotive.

**LEIGHTON BUZZARD, BEDS.**

**KEN SCANES**

## THE BENGUELA RAILWAY

G.S. Moore's article (NG 78) covers the steam locomotives well, but only briefly mentions the six British-built diesel shunters. The first of these were four North British Locomotive Co. Ltd. 0-6-0DH units (NBL 28042-3 built 1961, 28053-4 built 1962), CFB D1-D4. These 40 ton locos followed established NBL practice for export shunters, having outside frames and a rear-mounted drive unit with the jackshaft drive and SKF bearing coupling rods driving onto massive flycranks. The 9ft wheelbase gives a considerable overhang at each end. Power comes from a Paxman 8RPHXL 8 cylinder Vee type four stroke diesel engine and Voith-NBL type L24V hydraulic transmission. The engine is pressure charged to give 425 b.h.p. at 500ft, 400 b.h.p at 3000ft and 350 b.h.p. at 6000ft above sea level to suit the various altitudes along the line. The starting tractive effort is 24000lb., 20800lb. at 5 m.p.h. and 7100lb. at 15 m.p.h. The top speed is limited to 17 m.p.h. These locos proved very successful, and in common with other Paxman powered shunters in Africa the engines have performed exceptionally well with minute maintenance costs.

When more shunters were required, North British was no longer in business, but their goodwill had passed to Andrew Barclay Sons & Co. Ltd., who received an order for two further locos (AB 580-1 of 1972), CFB D11-12. Apart from the wheels, coupling rods and cooling group, these have a very different appearance, following Barclay mechanical practice with a lower bonnet and off-centre cab. The same Paxman engine is allied to a British Twin Disc hydraulic transmission with an axle-mounted final drive. The performance is similar to the NBL machines. Although British suppliers were interested in the mainline diesels, General Electric (USA) won the orders, as they have elsewhere in Africa, by superior credit facilities. It is perhaps gratifying to note that the performance of some North American power invading other parts of Africa leaves much to be desired.

**SCARBOROUGH, NORTH YORKS.**

**BRIAN WEBB**

The mainline diesels delivered to the CFB by General Electric are their U20C type carried on two six wheel bogies with motors on all axles. A 12 cylinder Vee type engine fitted with turbo-charger develops 2000 h.p. at 1025 r.p.m. The starting tractive effort is 59500 lb., 28900 lb. at 22 m.p.h. and 14500 lb. at 39 m.p.h. Maximum speed is 68 m.p.h., and maximum axle load 15 tonnes.

The first ten, CFB 101-110, arrived at Lobito in January 1973 and were put to work immediately. They were normally coupled together in pairs with the driving cabs at the outer ends. Livery is silver grey with a red stripe along the side.

**LONDON**

**R.D. JONES**

*(Mr. R.D. Jones also kindly provided information on the Cubal Variant included in the original article. Ed)*

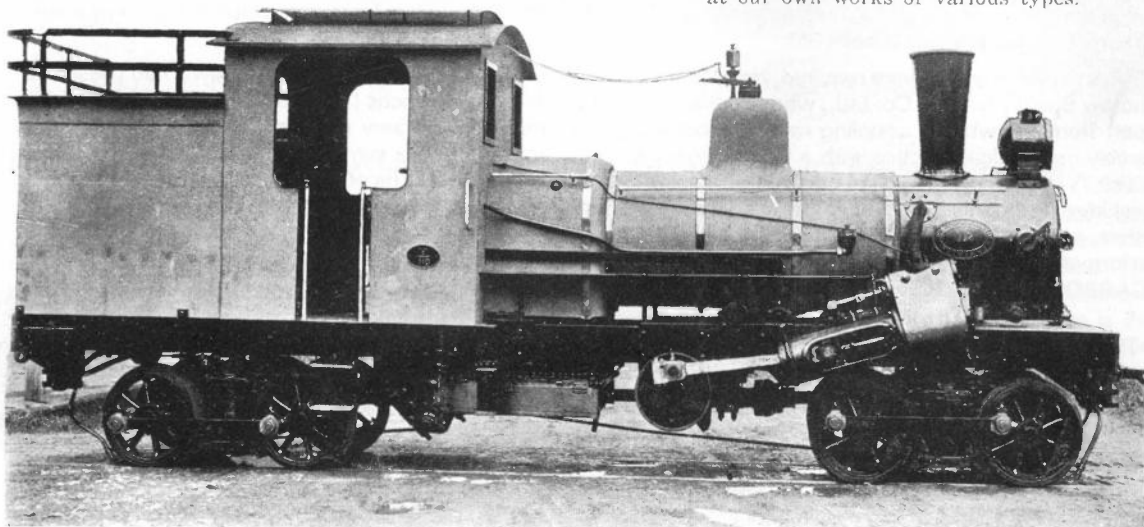


*Unloading GE U20C D-106 at the port of Lobito. (CFB official courtesy J. Scott Morgan.)*

# BUSH LOCOMOTIVES

With some 30 years' experience in locomotive building for the New Zealand Government we have naturally given attention to the sawmillers' requirements in the matter of haulage of logs to mill.

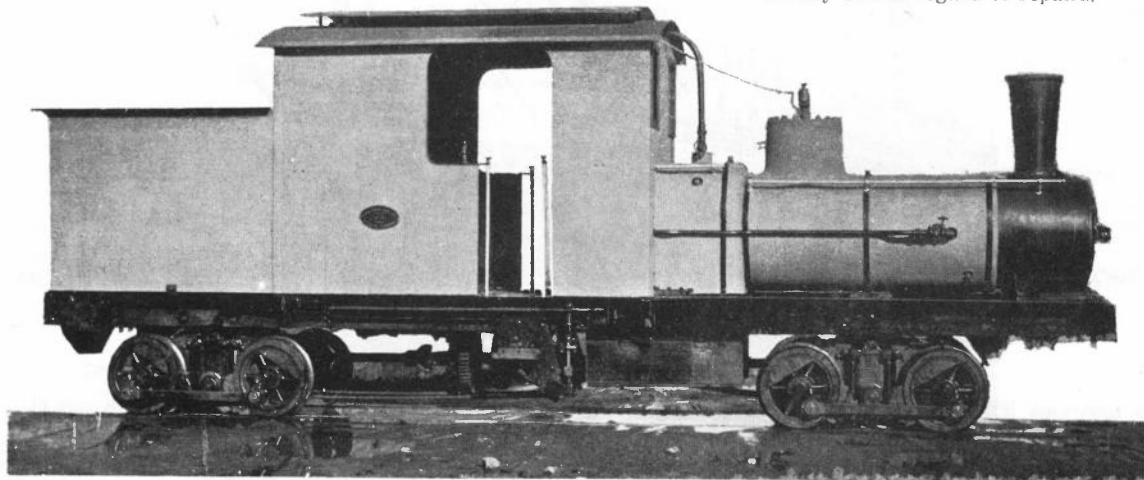
With so much variation of conditions and requirements it will readily be seen that each haulage proposition must be treated distinctly separately according to those features. We have happily been able to meet the requirements of our sawmilling friends by producing locomotives at our own works of various types.



E Type Locomotive.

We illustrate above our "E" Type Geared Locomotive for sawmill haulage work.

Another favourite design of geared Locomotive made by us is the "CB" type—a lighter machine than the "E" type, but one that has found much favour as a good job and one economically run in regard to repairs.



"C.B." Type Geared Locomotive.

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**Locomotives of New Zealand Manufacture**