

# **The Railway Collection Of The Museum Of Science & Industry**

**Presented By Rev. Dr. Richard Hills**

**On Friday 9th November 2007**

The size of the temporary home for the North Western Museum of Science and Industry in Manchester at 97 Grosvenor Street precluded collection of any large-scale railway exhibits. But even before the small displays opened in that building in the autumn of 1969, we were well aware of the broad scope of railway heritage in the Manchester region. There was not only the Liverpool and Manchester Railway itself, often called the first Inter-City Railway, but also the wealth of industries which developed to support the network of railways that soon emerged, all needing to be commemorated in any museum. A few names of local railway locomotive builders will show how important this industry had been:- Galloways, Sharp Roberts later Sharp Stewart, William Fairbairn; Hick Hargreaves, Nasmyth Wilson, Beyer, Peacock, the Vulcan Foundry at Newton-le-Willows, the Lancashire and Yorkshire Railway first at Miles Platting and then Horwich; the Manchester Sheffield and Lincolnshire Railway which became the Great Central at Gorton. These concerns were supported by a host of other industries supplying parts and equipment such as Davies and Metcalfe.

## **The Beyer, Peacock Collection**

The first preservation challenge arose while the Museum was still many years in the future. In the autumn of 1965, Beyer, Peacock announced that it would cease to manufacture railway locomotives at Gorton Foundry, opened originally in 1854. This was only a few weeks after my arrival to study the History of the Textile Technology under Donald Cardwell at the recently formed History of Science and Technology Department at what later became the University of Manchester Institute of Science and Technology. Something had to be done to preserve the archives of such an important historic company – the task fell to muggins. But how and what, as we had no funds, no storage space, no transport, in fact no museum. My begging letter on official UMIST paper asking what was going to happen to Beyer, Peacock archives was neatly filed away along with those of thousands of other railway enthusiasts all in for the kill. Eventually I did receive an answer, that I could ask again when locomotive production had ceased. But that would have been too late because we had a contact in the form of the person who ran the pub at Beyer, Peacock's gates and also worked in the Registrar's Department. He told us historic correspondence was being burnt.

We persuaded Lord Bowden, Principal of UMIST, to invite some of the Beyer, Peacock Directors to lunch and convince them of the seriousness of our intentions. Textile technology was forgotten as I and some other volunteers went to Gorton Foundry and rescued what we could. Leonard Davenport in the Drawing Office was particularly helpful as he knew what was still stored where. Colleagues in the small History of Science Department found themselves squeezed out of their rooms by Cost of Work Books, Wages Books, Order Books and much more. I remember overhearing a conversation between Beyer, Peacock's Chief Accountant Mr. Dawes and Leonard Davenport looking at a bound run of the Institution of Locomotive Engineer's Transactions – 'Do they have any value?' - Leonard Davenport, who coveted them for himself, replied, 'I don't think so'. Dawes answered, 'If we can't sell them, let Mr. Hills have them'. Such was the importance of preservation. My old Lancia car was pressed into service as well as the UMIST van. The General Arrangement drawings were deposited in UMIST Library. Harry Milligan, photographer at the Central Library, shifted a ton and a half of glass plate negatives and housed them temporarily in his department. Some of these negatives dated back to 1856 so here was photographic history as well as railway history. The Beyer, Peacock Collection was re-united in the temporary museum at Grosvenor Street before being moved to Liverpool Road where it is still one of the major collections.

## The Railway Rail Collection

At Grosvenor Street, we were able to assemble some other collections relating to railways. One was a small but significant collection of samples of rails to show the development of permanent way. Too often railway historians and enthusiasts take the track on which the trains run for granted but rails must be strong enough to support the trains, otherwise disasters will follow. Our aim was to show the development from earliest times to the present. The earliest railways dating back to the 1620s had wooden wagons with wooden wheels running on wooden rails. The wagons were pulled by people or horses. The rails prevented the wheels sinking into the ground. We were very lucky to be able to display a late example of a wooden rail from Nidderdale, Yorkshire, dating to the 1850s. But, as the weight of wagons and their loads increased, wooden rails quickly wore out, particularly after cast iron wheels had been introduced. So the rails themselves became made from cast iron. These may have been introduced at Coalbrookdale in the 1760s.

At this point, railway technology divided into two. There was the plateway type, exemplified in the Manchester region by the Peak Forest Tramway opened in 1796 which brought limestone down to Bugsworth basin. Here the wheels had no guiding flanges. The cast iron rails were 'L' shaped plates, about one yard long, laid with the flange portion of the 'L' on the inside. The wheels ran on the flat portion. Such rails were structurally weak and broke frequently. Later, a reinforcing rib might be added under the flat portion of the 'L'. The rails were supported on rectangular blocks of stone. Sometime they were secured directly with wooden pegs, at others, forms of chairs were placed at the joints. We had samples of these. But plateways proved to be a dead-end design mostly through their structural weakness.

The way ahead lay with the flanged wheel and edge rail. The Cromford and High Peak Railway built in 1825 across the southern part of the Pennines, finished at the canal basin in Whalley Bridge. Its rails were also cast iron, strengthened with a fish-belly underneath. Each rail was only about three feet long. They were supported once again on chairs on stone blocks. Horses pulled the wagons along level stretches while stationary steam engines hauled the wagons up connecting inclines. Once again, cast iron proved to be too brittle to withstand the weight and bumping of springless wagons and this form of track was already out-moded when the Cromford and High Peak Railway was being built. We had a broken sample.

The Liverpool and Manchester Railway at its opening used wrought iron rails about fifteen feet long once again supported on chairs secured to stone blocks. Each rail was mounted on four blocks and the rails were rolled in the form of a fish-belly between each block for added strength. Samples of rail sections, chairs and stone blocks formed part of the collections. Traffic increased so quickly on this line that even these rails soon proved to be inadequate and not strong enough. The collection contained samples of early wrought iron rails to show how stronger and stronger rails were produced, culminating in the 'I' shaped 'bull-head' rail with flanges top and bottom. Modern steel examples of these were obtained in the form of a wooden sleeper with chairs and short sections of rail. A concrete sleeper showed the type of track being used in the 1970s with flat bottom rail. Getting these up the stairs at Grosvenor Street for display proved quite a problem through their weight. For the Great Railway Exposition in 1980, short sections of line on concrete sleepers and concrete slab formation were displayed in the open at Liverpool Road Station. The size of these rails on these sections dramatically showed the greater strength needed to support modern trains.

Alongside the exhibits of rail track for ordinary trains, was a display of rails for road tramways. These were collected by an eccentric enthusiast, Stanley Swift, who lived in the Manchester Salvation Army Hostel. A rumour of workmen digging up any road in Manchester where trams had once run sent Stanley hurrying to the site to secure a section. He could tell at once whether it was say Richard Thomas and Baldwin's or Blackow Vaughan's, as well as the year. Imagine his sheer delight when resurfacing was being carried out outside Belle Vue and a siding laid with early horse-drawn tram track was discovered. A sample was procured. It was instructive to see the evolution of tram track from the light 'T' section rail which was all that was necessary for the small horse-drawn trams to the very heavy rail with its rolled-in groove to take the weight of bogie double-deck electric tramcars.

## **The Railway Signalling Collection**

It was another enthusiast who helped us secure an excellent collection of railway signalling equipment. The aim was to illustrate the evolution of mechanical, electrical and electronic aids for the safe working of railways, using equipment built or used in the region. Dr. Paul Spriggs, lecturer in the Metallurgy Department, was well known in the Manchester region of British Railways and beyond for his knowledge of railway signalling as well as the contents of most signal boxes. He helped us procure block instruments which we set up to demonstrate how trains were passed from one signal box to another as well as tablet instruments for single line working.

However it was the collection of lever frames to operate signals which were more important. It was not surprising that some signalling layouts lasted for years when the massive construction of some of these frames was revealed. An early example was the Mackenzie and Holland No. 11 'Soldier' locking frame from Macclesfield goods yard. Here the interlocking mechanism to prevent the wrong signal being pulled off or the wrong point being set was situated beneath the floor where the signalman stood. When the correct lever was pulled, links rotated two inch diameter bars with sort of cams on them. The cams moved more links which in their turn locked the other levers to prevent the wrong ones being pulled. The parts were massive and had to be lugged across the goods yard to where they could be loaded.

The Midland Railway frame controlling the single line to Hayfield at the end of the New Mills Tunnel had a much more elegant interlocking system situated at the back of the frame. The signalman grasped the catch-handle on the lever which moved the interlocking so he could pull off the lever if it were the correct one. The levers and parts of this Midland frame were much lighter than those from Macclesfield but even so had to be carried up the slope of the cutting behind the box. We had this frame with about ten levers re-erected at the top of the stairs to the basement in Grosvenor Street so that a simple sequence of setting signals could be demonstrated.

Brooklands Road signal box on the Altrincham line yielded its Saxby and Farmer frame but not without a struggle. In the gloom in the lower part of the box beneath the floor where the signalman stood, I could see there was a cast iron girder supporting the pivot bearing blocks for the levers. I assumed that the bearing blocks were bolted onto the girder and so could be easily removed. Oh no – the girder and the lower part of the bearing blocks were one very complex casting. We nearly brought the Altrincham line to a halt as we struggled to manoeuvre that casting across two sets of tracks over to the car park.

The size of these manual frames contrasted with the small scale of the operating levers and switch gear of the electro-mechanical systems installed by the General Railway Signalling Company at Central Station in Manchester, at Bolton and elsewhere. A section of one of these frames was placed alongside the Midland frame at Grosvenor Street together with actual signal arms – surprisingly large and weighty when brought down to ground level. After the closure of Central Station, I remember staggering from there back to Grosvenor Street with the panel from that box showing the layout of the tracks and signals which had been mounted over the signalling frames. Among a much more extensive collection, there was also the Metropolitan-Vickers electric interlocking signalling panel from Brunswick Junction near Liverpool, the first of its type in the world.

It had been my intention to place some of these frames at the end of the Power Hall at Liverpool Road Station in a small signalling display where the safety principles could be explained. Then visitors would pass out of the Power Hall through part of a signal box in which a frame could be mounted, linked to points and signals on the railway lines to control the demonstration trains running on the site. One or two signal boxes were investigated for possible removal and re-erection at Liverpool Road Station when they became redundant.

## **Liverpool Road Station Becomes a Possible Site**

After its formation, the Greater Manchester Council took over the role of the City of Manchester on the Governing Body of the Museum and it became clear that a far larger Museum could be envisaged. Having

looked at other sites, during 1978, the Greater Manchester Council decided that the original 1830 station buildings of the Liverpool and Manchester Railway ought to be the permanent site for a science museum. At first, only the actual 1830 buildings themselves were considered, purchased from British Railways for the exorbitant sum of £1. These posed great difficulties for a museum with heavy engineering exhibits owing to the poor condition of the wooden-framed 1830 warehouse and lack of adjoining space. Officers of the Greater Manchester Council proposed covering in the rail tracks in the 1830 section to house railway exhibits which would have destroyed the originality of the site. I was able to point out that the 1850s Goods Shed would be an ideal place to hold celebrations to mark the 150th anniversary of the Liverpool and Manchester Railway in 1980 and where permanent displays of mill engines and transport could be housed later.

But 1978 was leaving it very late to procure railway locomotives which could show their historical development and reflect the region's past achievements. We had missed the chance of many potential exhibits such as the first Garratt locomotive built by Beyer, Peacock of which more later. Locomotives in the National Collection not required at York had been dispersed to other places. But one aspect that presented itself and was not being preserved in 1978 was the fact that most of the private locomotive builders in Manchester had exported locomotives overseas. Some of these engines were still at work. However the cost and problems of repatriation would be enormous.

### **Isle of Man Railways, 'Pender'**

Since the Museum strongly emphasised education and explaining basic principles, one of my ambitions was to have a steam railway locomotive sectioned to show how it worked. I had been impressed with a locomotive on display at the Lucerne Transport Museum where parts of a small locomotive had been cut away and the engine mounted on rollers so its wheels and motion could be turned round. A person pointed out the various parts to a recorded commentary. The engine was small enough to be seen easily and it was situated at the bottom of a flight of steps on which people could sit or stand to view it. Could this be re-created at Liverpool Road Station?

Where could a suitable small engine be found, preferably one built in the Manchester region? Thoughts turned to the Isle of Man where all the steam locomotives bar one had been supplied by Beyer, Peacock. This fitted in with the policy of collecting exhibits that had been exported. In 1978, all still survived theoretically, with some in various stages of disrepair. It so happened that one of my cousins, who had married a Manx architect, was a member of the House of Keys. She arranged for me to meet the Minister of Transport over lunch. This was at the height of an I.R.A. bombing campaign when security was tight at every public building in England. I followed her instructions – 'Go up Constitution Hill to the large double doors at the House of Keys' – no police on duty so in I went – still nobody about. 'Ascend the stairs and you will see the doors of the debating chamber' – still nobody around so I went in. I don't know who was more surprised, myself or the Speaker, but I sat down where my cousin told me. The debate was about whether they should introduce roll-on-roll-off ferries.

I met the Minister of Transport and we agreed that, in return for my providing a report about the historic exhibits held by the Isle of Man Railways and the Manx Electric Railway for potential museums, we could have for Manchester one of the Beyer, Peacock locomotives, provided we did not run it but could use it as an advertisement for the Isle of Man. That debate which I attended resulted in favour of having roll-on-roll-off ferries – which were introduced at an opportune time for us. We were offered 'Pender' one of the first batch of three Beyer, Peacock locomotives purchased for the Isle of Man Railways in 1873. I had no idea how we could dismantle it, load the various parts probably at Castletown quay and get them to Manchester. Our salvation lay in the roll-on-roll-off ferry because Pender on a Pickford's low loader would just fit inside the loading door of the new ferry.

So it was in early September 1979 that Pickfords sent a low loader to the Isle of Man. It should have arrived at 3 o'clock which would have given us ample time to load so that the Pickfords wagon could return the next day. The boat was late so it was dark when loading started. The plan was to push Pender up the ramp onto the low loader with the Donegal railcar. All went well at first but there was only a manual winch on the low loader. We couldn't wind the winch quick enough to keep up with the push of the railcar so the wire rope

went slack, Pender ran back and nearly sent the tow bar through the radiator of the railcar. The situation was retrieved and Pender secured safely but too late to secure a passage for the following day. She did arrive in Manchester in time to take part in the parade through the streets of Manchester that September to commemorate the 149th anniversary of the opening of the Liverpool and Manchester Railway.

The problems then started. What to do with a three foot gauge locomotive when you have no safe storage? After a brief residence in a container at Pickfords' depot, a Work Experience Scheme for unemployed lads was set up to section Pender at Beyer, Peacock's Gorton Foundry. We were able to use part of the 1920s Boiler Shop which had been taken over by the Manchester Corporation Refuse Department. Space was found beneath the overhead cranes which still worked – luxury! Here with my Senior Technician, Sid Barnes, helped by a volunteer Jack Starkie a retired Beyer, Peacock employee, supervising the lads, Pender was sectioned and a concealed electric motor with gearbox fitted to turn the driving wheels.

During the Great Railway Exposition, Pender was displayed in the undercroft at Liverpool Road Station. She was then moved to the Goods Shed and a third rail for 3 ft. gauge fitted so that she could take part in the Christmas festivities organised by the Liverpool Road Station Society. Then the Goods Shed had to be cleared to give access for the builders who were to turn the site into a museum. Once again, the storage problem loomed up, resolved this time by offer of a temporary home in the Queens Road bus garage amongst the preserved buses. Then the day came when Pender could be moved to her permanent home in the Goods Shed, now the Power Hall, at Liverpool Road Station. She was displayed at the foot of the steps leading from the mill engine collection so that a group of people could stand on the steps to hear a member of the Museum staff explaining how she worked. She was mounted on rollers and the concealed electric motor energised. One person was heard to ask why, if the wheels were turning, didn't Pender move.

## **Replica Carriages**

With Liverpool Road Station definitely emerging as the permanent home for the Museum, I realised that something must be done to commemorate the opening of the Liverpool and Manchester Railway on 15 September 1830. I had been able to purchase a collection of commemorative pottery and glassware decorated with railway scenes. It would be possible to create some static display with reproductions of contemporary railway prints like those by Thomas Talbot Bury. But something rather more dramatic was needed. What better than a replica train of early carriages and an early locomotive. For the 1830 Great Railway Exposition, I realised that vacuum braked carriages would be an asset because they could be hauled by any visiting steam locomotive. Accordingly I looked at the drawings of Liverpool and Manchester Railway carriages in the 1838 edition of Nicholas Wood's Practical Treatise on Rail Roads. I scaled up the picture of the second class carriage and found, to my surprise, that it would be the same size as the four-wheeled goods wagons still in current use on British Railways. Through our contacts in the various railway trade unions, I went to a meeting with some railway officials at Horwich Works. All open goods wagons had been requisitioned to store coal due to a miners' dispute, but some covered goods vans were being scrapped. Luckily their frames and wheels were the same size as the open wagons. It was arranged that a couple of complete vacuum-braked chassis should fall off the lorries at Liverpool Road Station instead of at the scrap merchants. Timber was donated by a local merchant and another Job Creation Scheme organised to build the bodies. I had drawn the canopies at the same height as depicted by Nicholas Wood and they were built accordingly but we received so many complaints from people bumping their heads on the roofs that we had to raise the height. I still feel that people ought to experience the discomforts of 1830s travel!

## **Replica Locomotive**

Now we had carriages, we needed a locomotive to haul them. It should have local connections and be small enough to reduce running expenses. Ones that might have been suitable were the four-coupled Beyer, Peacock works shunter then at Oswestry, or perhaps the larger 0-6-0 'Bellerophon' built by Richard Evans' Colliery at Haydock from where our beam engine had come but that was on the Keighley and Worth Valley Railway. We had no money to purchase 'Lindsay', another locally built 0-6-0. We took the replica of 'Novelty', built by Locomotive Enterprises, into our temporary workshops at Gaythorn and endeavoured to make it 'fit for purpose'. We fitted it with a hand brake, endeavoured to make the air pump work that sup-

plied air to the fire in the boiler and also much more. That boiler – to feed the fire, coke was dropped into a small hopper at the top of the firebox. The lid was closed and a sliding hatch opened at the bottom so the coke fell onto the fire. But how to see the state of the fire? The air pump had to be stopped, both lid and sliding hatch opened – wait for the explosion of carbon monoxide gas to occur and then take a quick peep over down to the fire. My Keeper of Industry, Ken Barlow, miss-timed his peep and got an explosion full in his face. Locomotion Enterprises wanted £10,000 for this very doubtful asset.

I took Novelty to Sweden at the request of the Swedish Railways to celebrate their 125th anniversary because this locomotive had been designed by Eriksson, the Swede. Novelty arrived at the railway museum at Gavle and was placed on a length of track where she could be demonstrated. The valves on the cylinders were driven by a single eccentric secured by a single Allen screw. Of course this was insufficient and the eccentric slipped. I could take no tools but we were in luck because the person assembling an adjacent display had the correct size of Allen key. A Swedish Railway maintenance van also had a useful range of tools and oxy-acetylene welding equipment so we were soon in business. Steam was up on the grand opening day – a short trial run, when that eccentric slipped again just as the train from Sweden carrying the big-wigs went past to Gavle station. I had to borrow that Allen key again and crawl underneath Novelty in my boiler suit to refix that eccentric. Luckily the opening speeches took a long time. As I crawled out from underneath, the big-wigs descended upon Novelty. I was unaware that the Mayor of Gavle in his speech had said, 'We must buy Novelty for our museum'. And passed the hat round. In dirty boiler suit and black hands I was introduced to the Director General of the Swedish Railways who said, 'Dr. Hills, show us how she works'. I clambered up, engaged the valve gear, opened the throttle and to my great relief, she moved away obediently. She was sold. This was in fact another relief because Novelty would never have been capable of hauling those replica carriages at Liverpool Road Station. The Central Electricity Generating Board came to our rescue by lending one of their 0-4-0 shunting locomotives from Agcroft Generating Station. We were able to persuade Davies and Metcalf to fit an ejector suitable for creating the vacuum to work the brakes on the replica carriages. So we acquired a workable train for the world's oldest passenger railway station. Eventually, the 1830 period was represented by the loan from the Science Museum of their wooden replica of Novelty. We fitted a concealed electric motor to turn the wheels which were off the original Novelty. I investigated having small scale models made of other locomotives of the 1830 period to form an introduction to the locomotive display but lack of funds prevented this scheme coming to fruition.

## **The Pakistan Locomotive**

Novelty represented the very early period up to 1830. With Pender, we have moved forty years on into the time when the railway locomotive had reached its first maturity. Move on another thirty years or so and we have the classic 4-4-0 express tender locomotive that reached its peak in the early Edwardian period soon after 1900. Around 1980, Pakistan Railways were still running some of their 4-4-0 locomotives built by Nasmyth Wilson and the Vulcan Foundry. They were, of course, 5 ft. 6 in. rail gauge so wider than those on British Railways. The British Overseas Railways Historical Society tried to secure a Nasmyth Wilson example on behalf of the Museum but these were all scrapped while negotiations were still at a preliminary stage.

However President Zia of Pakistan did agree to us having one of those built by the Vulcan Foundry. This presented me with a further dilemma because the Liverpool Road Station site was still being refurbished and in the hands of the contractors. Even so, in anticipation that we could eventually accept this offer, a third rail to give 5 ft. 6 in. gauge was laid into the Goods Shed. In the meantime, one of the Pakistan Railways 4-4-0 tender locomotives was despatched under its own steam from Lahore down to the docks at Karachi where it was loaded into the hold of a Pakistan cargo ship. It was too late to ask the Pakistan authorities to keep it for us a little longer.

The ship duly arrived at Liverpool. The Greater Manchester Council reluctantly agreed that the locomotive could be stored outside the Goods Shed while the contractors were refurbishing the interior. The mammoth steam crane at Liverpool Docks was fired up and moored alongside the Pakistan ship, towering above it. Sniffer dogs inspected the locomotive in the hold for drugs. The tender was lifted out first and lowered onto the waiting Pickfords low loader. Next it was the turn of the locomotive itself. I had gone onto the quayside

to take photographs and was unaware that the slinging gang had not used a spreading beam at the front end. This not only caused that end of the locomotive to be lifted lower than the rest but the hawsers bent part of the running plate. Perhaps it was luck that Pickfords larger low loader blew up en route so did not arrive until the following day. Remember that the crew of the mammoth crane could not see over the sides of the cargo ship. As the engine was being lowered, the bogie wheels hit the quayside first. As the rest was being lowered, the engine ran a yard or so along the quay before the crane could bring it under control. Luckily no further damage was done, which could have happened had the locomotive been lowered onto a trailer.

On arrival at Liverpool Road, running the engine off the low loaders onto the track was comparatively simple, care being taken to see that both locomotive and tender were facing the right way round. It was with considerable relief that I saw the chimney of the locomotive pass under the lintel of the doorway into the Goods Shed, something I had been unable to check. The engine had to remain outside for most of one winter before the Goods Shed was ready for exhibits. During the visit of Her Majesty the Queen to Liverpool Road Station, Prince Philip enquired about the engine. It had some of the latest technical features, such as superheating and vacuum brakes. I had hoped to pipe it up to the same steam system as supplied the mill engines so the wheels could be turned round but the position of that supply was altered and was too far away from the locomotive.

### **Black Five 4-6-0 Tender Locomotive**

Ken Aldcroft lent his Black Five type of 4-6-0 general duty tender locomotive. This advanced engineering technology another thirty years into the 1930s. The Liverpool Road Station Society had ambitions to run steam-hauled special excursion trains between Manchester and Liverpool. This locomotive might have been suitable but needed repairs to the boiler. This was beyond the scope of facilities at Liverpool Road. Another home was found for it later so it was removed. Those four locomotives, Novelty, Pender, the Pakistan locomotive and the Black Five would have covered most of the improvements in locomotive design over the whole period of the steam engine.

### **Electric Traction**

The Goods Shed at Liverpool Road had twin rail tracks extending for its full length. Goods were transferred across a central platform to road vehicles on the other side. The length of the track was shortened to allow for the installation of the mill engines. Where the tracks remained, I had the platform narrowed and one track slewed across to allow a better viewing space between the railway exhibits. The remaining part of the platform was to be devoted to a small display on the Manchester hydraulic power supply system and the development of electric railway traction in which Manchester played a leading role.

One of the pioneers in electric traction was Mather and Platt. This firm had supplied equipment to the Manx Electric Railways in the 1890s. To my surprise, the carriages on the Snaefell Mountain Railway were still powered in 1978 by their original Gramme ring type electric motors. Modern electrical equipment was being fitted. I was able to obtain a controller, a motor and a set of wheels which we mounted in part of a bogie. We wired the motor up for demonstrations. Another exhibit was a pantograph from one of the Direct Current driving cars of the Altrincham line. This could be raised and lowered.

Further along the platform, we placed the cab cut off one of the Manchester and Sheffield Railway Bo-Bo electric locomotives. These were developed by Metropolitan-Vickers in Manchester. Its associated control switch gear was mounted on the platform so that it was possible to explain how to drive such a locomotive. I had hoped also to have a speeded-up film of travelling from Manchester to Sheffield over Woodhead in four minutes as a further piece of interest. York Railway Museum had preserved a complete example of this type of electric locomotive so there was little point in obtaining another.

It had been the intention of the London and North Eastern Railway to extend the electrification of the Manchester to Sheffield line up to London. This was overtaken by nationalisation of the railways and the development in France of the 25 kVa A.C. system which British Railways preferred to the existing 1,500 volt D.C. system of Manchester. But six Co-Co EM2 electric locomotives were built at Gorton with Metropoli-

tan-Vickers electrical equipment. Their capacity for 100 m.p.h. was never fully utilised over the Pennines yet they were the first high speed electric locomotives to perform regular passenger duties in Britain. When passenger services ceased on the Woodhead line in 1966, these locomotives were sold to the Dutch Railways where they covered a far greater mileage than at home.

The time came for the withdrawal of the EM2s. I think that it was once again through the British Overseas Railways Historical Society that we got in touch with an Englishman, David Ward, working for the Dutch Railways. I went over to the Netherlands and negotiated through him with the Railway authorities for the presentation of one of these six EM2s. This was granted with the proviso that it remained in its Dutch Railway colours. Here again we were lucky with the timing. These locomotives had been sent to the Netherlands by rail, using the Harwich to Hook of Holland train ferry. We were lucky that No.1505, Ariadne, could be brought back the same way shortly before this ferry service was terminated due to the opening of the Channel tunnel. It would certainly have been very difficult to negotiate hauling such a locomotive through Belgium, France as well as the Channel Tunnel itself. I went to Harwich to see Ariadne being hauled off the ferry. This was a tricky operation since a weight of over one hundred tons being removed from one side of the ship unbalanced it against the loading ramp. Also Ariadne could not be coupled directly to a diesel locomotive of similar weight while on board the ship. The locomotives had to be separated with a line of trucks. All went well so Ariadne landed safely once more on British soil to begin her final journey to Liverpool Road Station.

### **The Garratt Locomotive**

One major contribution by a Manchester firm to railway locomotive design still eluded us. That was the articulated Garratt locomotive developed by Beyer, Peacock into some of the largest steam locomotives ever built in the form of the Beyer-Garratt. When Beyer, Peacock was closing Gorton Foundry, I looked longingly at the first Garratt which had been purchased by the Tasmanian Railways in 1909 and had been repatriated by Beyer, Peacock after the Second World War. But we had no museum, nowhere to store it, no money to purchase it. Luckily the Ffestiniog Railway stepped in so that today K1 has a second lease of life on the Welsh Highland Railway. One of the few Garratt types to work in Britain, the shunting engine at Sneyd Collieries, found a home at Bressingham while the L.M.S. ones and that for the L.N.E.R. had long since been scrapped. But some were still running overseas.

An example of one of the later Beyer-Garratts would be a fitting memorial to the heyday of Manchester engineering. One such could have been the massive 59 Class for the metre gauge East African Railways. An approach was made once again through the British Overseas Railways Historical Society and one was earmarked for preservation but the £120,000 or so needed to ship it back home proved beyond the reach of the Museum. Then a series of remarkable coincidences fell into place so that one of the 1930s mighty GL Garratts in South Africa was brought back to Manchester. Liverpool Road Station had been opened as a museum. A space had been left in the Goods Shed, or what had now been renamed as the Power Hall, for either development of a road transport section or more hopefully for a Garratt locomotive. We learnt that the South African Railways were intending to scrap their strategic reserve of steam engines, among which was one of the second batch of the GL Class, arguably the most powerful Garratt type. It would be a major acquisition for the Museum.

An approach was made to the South African Railways but this letter never reached them. In the meantime, Overseas Containers Limited gave a very generous quotation of £30,000 for shipping the engine. Extra finance was promised by the Greater Manchester County Council. The project looked feasible although there were still many hazards to overcome, such as moving the engine five hundred miles from Germiston outside Johannesburg to a port. Early in October 1983, I heard that the General Electric Company would be moving some heavy pieces of electricity generating steam turbines and transformers to the Transvaal on three heavy lift road trailers at the end of the month. Each trailer was capable of carrying 100 tons – and they would be returning to England empty. Now a GL Garratt weighing a mere 160 tons would split into three parts. G.E.C. was willing to allow the trailers to be used and Wynns, the Stafford road hauliers, were willing to load and deliver the locomotive to Manchester. Now we had the possibility of repatriating a locomotive – but no response had come from the South African authorities.

As soon as it was discovered that my first letter had gone astray, a second was sent, pointing out the possibilities of the GEC-Wynns operation. The ship carrying the electrical items had left before a telex from South Africa was received on November 18th to say that we could have GL Class No. 2352 for display in Manchester. But then an unforeseen snag arose because, owing to the South African road regulations, Wynns' trailers would be unloaded at the port of Richards Bay, 1000 km. away from Germiston. A further complication was that only air-braked vehicles could use the new direct line from the Germiston area to Richards Bay and 2352 had only vacuum brakes. Also 2352 had not moved for twelve years. Luckily the South African authorities undertook to move 2352 to Richards Bay. It was a major feat of organisation to prepare 2352 for her journey from Germiston first down to Durban and then on to Richards Bay along the old route in the middle of the Christmas rush with a top speed of only 30km/h (20 m.p.h.) and only in the hours of daylight. Heavy rains which broke a three-year drought also complicated matters. 2352 left Germiston on Tuesday December 6th and arrived at Richards Bay by 10.30 a.m. on Tuesday, December 13th.

I flew out to Johannesburg where I was entertained by the railway authorities and chatted them up before flying on to Durban. Here I caught up with 2352. She looked a forlorn sight after twelve years in the grime and soot of Germiston depot. The connecting rods had been removed and placed in the coal bunker which was half full. Otherwise 2352 seemed complete except for many of the boiler fittings and oilers. Wynns had agreed to send their men out two days early to separate the parts of the locomotive but, while I had studied our surviving drawings at Manchester, I had never seen the details of a Garratt locomotive. So it was full of apprehension that I reached Richards Bay to find that 2352 had arrived safely and was the first steam locomotive to enter the port.

As we were struggling to separate brake and reversing rods, steam pipes, pivot bearings, mechanical stoker and other parts, a white van drew up – 'pist, do you want some boiler fittings?' As the engine passed through Pietermaritzburg, someone had been detailed to see what was missing. We put the fittings in the front watertank. I jumped off the engine onto the ground – Ouch - the scorching heat of the ground seared through my shoes. Wynns men had hydraulic jacks, beams were placed under the boiler unit which was lifted off the engine units, enabling them to be drawn out from underneath. By two o'clock on Wednesday, the engine was ready for loading. But how?

The roll-on-roll-off ship, the 'Elgaren' from Gotenburg, reached Richards Bay ten hours late at four o'clock on Friday afternoon and was due to sail twenty-four hours later. By two o'clock early on the Saturday morning, Wynns men had off-loaded eight large lumps of electricity generating pieces weighing over 100 tons each. Work started again at 8 o'clock that Saturday morning. The boiler on its beams was raised, a trailer run underneath, the boiler lowered onto packing pieces and the beams removed. A tug towed and pushed the boiler unit up the ramps into the Elgaren.

But then it was realised that the engine units could not be treated in the same way because they were so packed with wheels, pipes, brake gear, etc. that lifting beams could not be used. Also, if a single crane were used, spreader beams would have been necessary so that the slings would hang vertically to clear the watertanks. The solution was to have one of the ship's 35 ton fork lift trucks at one end and a 200 ton crane at the other, made available by the harbour authorities. But how could the engine units be secured onto the trailers which were just an open grid of steelwork with no top platform. The wheels of the engine units would fall into the gaps. Then a brilliant idea struck me – Wouldn't it be nice if, back in Manchester, 2352 could be displayed on genuine South African rails? Problem solved and rails duly appeared which were placed on the trailers. The trailers were run under the engine units from the crane end and the units lowered onto them.

By two o'clock on the afternoon of Saturday December 17th, Wynns men were washing their hands. The three trailers with the engine were being chained down. Soon the massive ramp was being raised. The Elgaren sailed on schedule for four o'clock. A few weeks later, she would have been loaded with oranges leaving no room for a Garratt locomotive. Blizzards were sweeping across Scotland and a bitter cold wind was blowing down the Thames when the Elgaren docked at Tilbury early during the morning of Thursday January 19th. The bureaucratic problems of Her Majesty's Customs and Excise had been sorted out by pay-

ing over £2,000 Value Added Tax (value added to what?). Unloading went smoothly and the three units were rolled off. Customs clearance was given the same afternoon.

But then plans went awry because the blizzards had totally disrupted the electrical apparatus of the Central Electricity Generating Board. Wynns men were engaged moving vital transformers and other parts to keep supplies going. 2352 was stored on the trailers at Stafford. The snow had disappeared from Liverpool Road Station when the engine units arrived during the afternoon of Tuesday January 31st. It was essential that all the parts came in the right order and were the right way round. Track had been prepared for the engine units. The space at the Station seemed vast until a tractor and trailer arrived. However it was not until five o'clock on Wednesday that the rear unit was run off due to the restricted space. One end of the trailer could be raised hydraulically and the unit run down special ramps, checked by a wire rope. By two o'clock on the Thursday, the front engine unit had been run down onto its prepared track. By this time, the boiler unit had arrived on its massive trailer with eighty wheels in ten rows. It had to be backed in to get it the right way round which actually made manoeuvring it a little easier. Even so it took three attempts to manoeuvre the trailer through the main gate. Luckily the wheels were self-steering through a hydraulic system.

Friday morning was occupied with placing lifting beams under the boiler and putting four stands into position. The trailer was backed into position and left there for the weekend. Work started again on Monday. Oil had leaked out of the hydraulic system during the South African trip so the jacks had barely half an inch clearance when lifting the boiler. There was only just enough space for the tractor to pull the trailer clear of the boiler. Wynns equipment was taken away and the boiler was left supported on the Museum's own stands, ready for cleaning, reuniting with the engine units and moving into the Power Hall for final restoration.

While this unloading was in progress, news came through of a hurricane devastating the area round Richards Bay in South Africa. Had this tragedy occurred earlier, there would have been no possibility of moving 2352. So, through a series of remarkable coincidences, a series of remarkable openings in time and conditions, a series of remarkable cooperation from railway authorities, shipping and transport managers, as well as staff, such an impressive and historic exhibit would not have been brought back to Manchester.