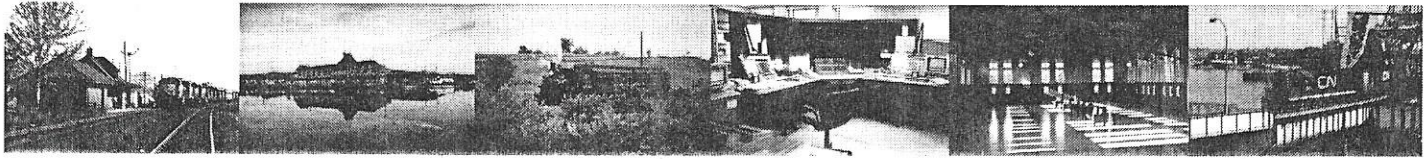


# Research and Reviews



## Just A. Ferronut's Railway Archaeology

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To keep last month's promise, let's have a little peek at a short-lived railway that hasn't operated any trains for almost 140 years, but still serves some industries today. This railway was the Preston and Berlin Railway Company, not to be mixed up with the later and better-known Preston and Berlin Street Railway Company. Confused? Well, I was, until a number of years ago when I spent a few days at the libraries, etc., in the area and discussed and compared notes with several other railway enthusiasts. This column attempts to highlight the Preston and Berlin Railway Company in perspective with the other railways of this part of the Grand River Valley.

The Preston and Berlin Railway Company was an early railway along the Grand River Valley between the Kitchener-Waterloo and Cambridge areas of Ontario. Preston was one of the communities that make up Cambridge today, and Berlin was the name for Kitchener prior to it being renamed in 1917 for Lord Horatio Herbert Kitchener. Lord Kitchener, a British field marshal and statesperson, was drowned in 1916 with the sinking of the *HMS Hampshire* on its way to Russia.

The residents of Waterloo Township, as well as their neighbours to the south in the Dumfries, like most people in the Canadas of the 1830s, were caught up in the hype of this newfangled mode of transportation that would solve many of their problems – railways. However, it would be 20 years before the people of Canada West would start to see their efforts and money transformed into iron monsters puffing their way across the rural landscape between their growing communities.

By the middle of the 1850s, the two major railway companies of Canada West were getting their lines in operation through Waterloo and South Dumfries Townships. The Great Western Railway started operations on their line from Hamilton to London with a special train on December 15, 1853. This operation was over what today we would call skeletonised track, and that was a factor in many accidents – but that is another topic.

The Grand Trunk Railway of Canada train operation between Toronto and Brantford started in the middle of October 1855. The *Berlin Chronicle* of February 6, 1856, reported that the GTR had run a train from Toronto to Guelph on January 30, 1856, to show the "Provincial Nabobs" the value of their monetary support.

The first regular GTR passenger train, with nearly 150 passengers, arrived in Berlin from Guelph on Wednesday morning, June 18, 1856.

The *Stratford Beacon* of September 5, 1856, reported that the first GTR iron horse made his debut in Stratford on Wednesday, September 3, in the presence of a number of spectators. This same article reported that I. N. Hall had received a stock of watches and jewellery by the Grand Trunk.

The competition between the GWR and the GTR and their locations were both major factors in setting the stage for the early railway lines along the Grand River. The Grand Trunk, primarily backed by Canadian and British supporters, was, as its name implied, to be a "trunk line" to connect the major Canadian centres with an ice-free seaport to provide year-round contact with Europe. Since we are talking of the years before Confederation, the maritime provinces were not part of the Canadas, and Portland, Maine, was the chosen seaport. The GTR promoters were also looking at enticing as much western U.S. traffic as possible to their line. The prime source of that traffic was Chicago. The straightest possible line from Toronto towards Chicago placed their line through Berlin.

The Great Western Railway, in addition to the support of British investors, used U.S. support that was looking for a line north of Lake Erie to get around some of the U.S. competition to gain access to Chicago. The alignment of the GWR from Hamilton, on its approach to Harrisburg and Paris, was established up the Niagara escarpment to suit the demands of two of the railway's influential

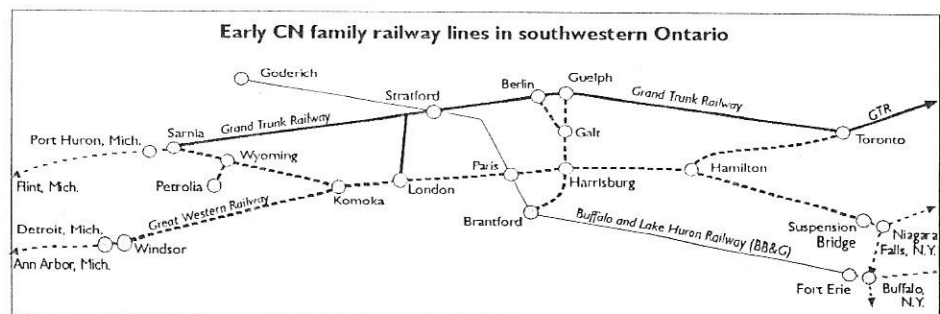
supporters, Sir Allan Napier MacNab and Dr. Hamilton, who insisted that the line serve their lands.

So as these two railway systems opened their parallel systems across the Grand River, as shown in the overview map, they were about 20 miles apart. The simple difference in the sizes of the two systems, and Canada's broad track gauge, quickly made the Great Western the underdog. One final item that made the upper Grand River a growing community was the immigration of the Mennonites, who arrived in Waterloo Township in 1805 and were creating a growing market around the community of Berlin that was too enticing for the Great Western, and later other railways, to overlook.

### The railways' march up the Grand Valley

The first railway sounds in the valley were from horse-drawn earth scrapers and ringing spike hammers as construction progressed on the 11.75-mile Great Western branch line from Harrisburg to Galt. This work followed the 1850 authorisation for the GWR to build this branch. The summers of 1852 and '53 saw construction in full swing. An advertisement in a March 1852 newspaper called for hundreds of labourers for work on this branch. The official opening of this branch took place on Monday, August 21, 1854. The Great Western Time Table of September 5, 1855, for the Galt Branch shows that this community had two trains for passengers arriving and two departing daily, except Sunday. The footnote of this Time Table is interesting:

"Stages – Leave Station on the arrival of the 7:10 p.m. Train for Preston, Berlin, Waterloo, St. Jacobs, Haysville, Hamburg, Peterburg, Stratford, Mitchell, Harpurhey, Clinton Corners, and Goderich, also, for New Hope, Guelph, Elora, Fergus, Arthur, Durham Village and Owen Sound, returning from these places in time for the 9:00 a.m. train. – C. J. Brydges, Managing Director."



### The Galt and Guelph Railway Company

Amongst the Hamilton business fraternity that had supported the Great Western was Isaac Buchanan, a Scottish-born politician and successful merchant. He in company with seventeen other gentlemen incorporated The Galt and Guelph Railway Company under a Province of Canada Act, on November 10, 1852. This act authorised the construction of a 15.2-mile line extending from Galt, via Preston, Hespeler, and Glenchristie, to Guelph. Construction was slow in starting due to the poor general economic conditions. Messrs. Brown, McDonell, and Cotton were awarded the contract for the construction of this line. However, in the spring of 1855 this firm advised the G&G that it was impossible for them to continue with the work. It was reported that the work completed at that time was valued at almost £13 000. The first four miles of the Galt and Guelph Railway Company, from Galt north to Preston, was opened on November 28, 1855.

By March 1856 there was an engine house at Preston, since it was reported that about 20 gentlemen, principally inhabitants of Preston, attended the G&G's annual meeting there on March 3, 1856.

The G&G promoters approached the communities for financial aid. The communities of Galt, Preston, Hespeler, and Guelph responded with subscriptions to this project. The Town of Galt provided \$62 500.

The G&G, like many small early railways, was plagued with bridge design problems. The science of bridge design was still in its infancy in the 1850s. The few qualified designers were used on the construction of the larger structures. This resulted in many smaller bridges, being built without the benefit of engineering.

On the afternoon of Monday, July 7, 1856, a gravel train with 13 loaded cars was working around Main Street in Galt. As this train was passing over Mill Creek bridge just north of Main Street, the engineer felt as if something was giving way. On looking back, he saw the bridge sinking. To quote the reporter of the day, "With admirable presence of mind, he called to the fireman to 'loose the brake,' and putting on the whole steam of the engine, it gave a leap into the air, and in a violent effort threw itself off the bridge on to the road, carrying the tender and one of the gravel cars with it." The remaining 12 gravel cars fell into the stream. Of the six men on the gravel cars, three were killed.

The opening of the Galt and Guelph Railway along the Speed River from Preston to Guelph was reported in the *Berlin Chronicle* of September 15, 1857, as follows, "The line will positively be opened on Monday, September 28, 1857. Trains will leave Guelph at 7 o'clock in the morning, and half-past one in the afternoon."

The Great Western's Timetable of October 14, 1857, stated that effective Monday, October 19, 1857, the morning train would

leave Guelph at 8:15 a.m. for its two-hour run to Harrisburg. The afternoon train left at 4:45 p.m., arriving in Harrisburg at 7:00 p.m.

The Galt and Guelph Railway Company, although it was always operated by the Great Western Railway, survived as an independent company until 1860, when its financial woes reached the point that the GWR foreclosed on its mortgages and took it over.

### The Preston and Berlin Railway Company

Now that we have described the railway network around the area of the Preston and Berlin, it's time to look at this line. While, as indicated, this line had been discussed for many years, indications are that it was 1855 before any physical work was commenced. In June 1855, the Board of Directors of the Galt and Guelph Railway approved a survey for a line from Preston to Berlin.

This year, 1855, also saw the Village of Berlin pass a by-law to subscribe £5000 to the Galt and Guelph Railway towards the building of a branch line from Preston to Berlin.

Following the financial support of municipalities like Berlin, the Galt and Guelph Railway started at least some construction in 1855 and 1856 on this line that was to extend from the Galt and Guelph Railway in Preston, via Doon and German Mills, to Berlin. The Galt and Guelph Railway, probably to keep the municipal subsidies straight, decided to incorporate this branch line to Berlin as a separate company.

The Preston and Berlin Railway Company was incorporated on June 10, 1857, under Act 20 Victoria Chapter 147, Province of Canada, on petition of the Galt and Guelph Railway, to take over construction and to operate the extension of the railway, proposed to be built by the Galt and Guelph Railway Company from Preston to Berlin.

Mid-summer 1857 saw the report that "The Preston and Berlin Railway is rapidly approaching completion, and, according to appearance, will be open very shortly after the Galt and Guelph line."

The September 15 report on the opening of the G&G stated that at Berlin, while no work had started on the P&B station, the lumber was on site for this frame station. The station in Berlin was on the south side of the Grand Trunk and just west of King Street. Indications from the opening luncheon speeches imply that there was a track connection with the GTR. The P&B had purchased land east of King Street west of the present GTR/CN/VIA station to extend their trackage to permit either a union station or adjacent stations. While this land had been purchased, the land for a connecting right-of-way was not, and no work on this proposed eastward extension was ever undertaken.

Mr. Samuel Keefer, the Government Inspector, examined the works on the Preston and Berlin Railway on Friday, October 23, 1857. He scrutinised the bridges, etc., very closely, and stated that he was satisfied with

the substantial appearance of everything.

With Mr. Keefer's inspection being satisfactory, it was announced that the opening of the road would take place on November 2, 1857. The time table dated October 26, as we have reproduced, stated that trains left Berlin at 8:20 in the morning and 4:50 in the afternoon, arriving again at 12:05 noon and 8:45 in the evening. A connection was made with trains going east and west at Harrisburg, and no change of cars was needed at Preston. This version of a P&B timetable is probably the only one ever used for this railway. The December 12, 1857, GWR timetable combined the Guelph and Berlin branches into one.

While there was grumbling in Galt that no holiday had been declared for the opening of the P&B, there were celebrations in Berlin. The Berlin town council, while the time was short, arranged for a civic luncheon at Mr. Klein's Hotel. Invitations to the luncheon were sent to the directors and officials of the P&B, the Great Western, and Galt and Guelph lines, and to the council and most prominent citizens of the neighbouring towns.

The official inaugural train over the new line, consisting of two passenger cars thronged throughout, arrived at Berlin at 12:15 p.m. The artillery company saluted its arrival in the loudest tones they could manufacture for the occasion. The guests were received at the station by the Reeve, H. S. Huber, and were escorted in carriages to Mr. Klein's Hotel, where, a little after 1:00 p.m., a party of over one hundred gentlemen, including A. J. Fergusson, MPP of Guelph, sat down to an excellent champagne luncheon.

**Great Western Railway.**



**OPENING OF THE  
Preston and Berlin Branch.**

**ON AND AFTER MONDAY, 2d  
November, 1857, and until further notice,  
Trains will run as follows:**

FROM BERLIN.		
	A. M.	P. M.
Berlin, depart.....	8 20	4 50
Doon, " .....	8 42	5 12
Preston, " .....	9 00	5 30
Harrisburg, arrive.....	10 00	6 30
Hamilton " .....	10 56	7 20
P. M.		
London " .....	2 15	
TO BERLIN.		
	A. M.	P. M.
London, depart.....	7 30	4 10
Hamilton, " .....	7 45	5 40
Harrisburg, arrive.....	10 15	7 00
Preston, arrive.....	11 20	8 00
Doon, " .....	11 40	8 20
P. M.		
Berlin " .....	12 05	8 45

Passengers to and from Berlin for Stations on the Main Line, will change cars at Harrisburg. There will be no change at Preston.

**C. G. BRYDGES,  
Managing Director.**

G. W. R. Offices,  
Hamilton, October 26, 1857. 573-6

To ensure the consumption of champagne fitted the occasion, the chairman proposed, "Prosperity to the Preston and Berlin Railway," in addition to the usual toasts to the Queen and Country. Mr. Keefer told the gathering that the road was well built, and he indicated that some culverts were superior to those upon the Grand Trunk.

The consensus of the dinner party was that the road itself was built more substantially than most had expected. The long bridges upon the line were exceedingly strong structures. There were a number of curves on the road, but these, it was understood, were unavoidable. The cars travelled very smoothly, for a new road, and the officers engaged were said to be courteous and obliging.

These men patted themselves on the back over the admirable location of the road, and the vast and wealthy country it ran through and tapped. It was expected that this line would ultimately be one of the best-paying branch lines in America, as well as a most important feeder to the Great Western Railway.

Hardly had the effects of this luncheon worn off before problems for the P&B started. The first came when it was realised that Berlin's 1855 by-law for a subsidy to the P&B was illegal. This meant that a second by-law had to be prepared. Since the P&B was in operation, much of the 1855 support for its construction had waned and council voted down the second by-law on December 3, 1857. This led to a lengthy legal battle. As in these types of cases, there were lots of barbs thrown around.

Contrary to statements from people like Government Inspector Keefer, there were those that questioned the calibre of both the design and construction of the P&B. Reports indicate that there were 22 curves on this 9.7-mile road, accepted to reduce the excavation and fill. Some curves had a radius as short as 700 feet (8 degrees), and there were also sharp reverse curves. The 9.7 miles of the P&B cost, without equipment, £103 000, about the same price per mile as had been paid for the Grand Trunk.

The P&B had its finger-pointers about insider profiteering. One such comment was on the "good fortune" that the Honourable Jonathan Spiller had in buying up certain parcels of land in the vicinity of all the principal stations.

Less than three months after the opening of the Preston and Berlin came its closing. The *Berlin Chronicle* of Wednesday, January 28, 1858, reported that the P&B would be closed at the end of January since the receipts of the road were not sufficient to induce the Great Western Railway to continue running it. The same paper a week later, February 3, 1858, reported that the P&B bridge over the Grand River had been washed out and closed up the railway. Two stages were put in service between Preston

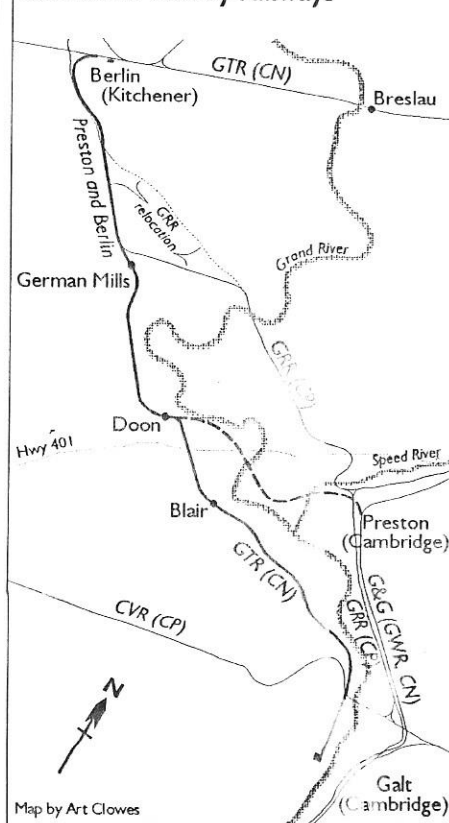
and Berlin to replace the trains.

The exact configuration of the Grand River bridge is subject to some dispute. One report describes the bridge as one of stone abutments supporting a Howe Truss. Another account states, "the masonry of the upper face of one of the piers, with which the ice would come in contact is unbroken - the wall is cracked at the lower end - if the ice have done this, it must have travelled up stream - the other pier has collapsed entirely not having been built sufficiently strong to hold together." To me, this second account of a bridge, with at least two piers in addition to the abutments, both fits the site and makes more engineering sense.

The statement about the bridge with piers was made in rebuttal to statements from those who blamed the bridge collapse on the lack of ice-breakers for the bridge that had not been constructed because Berlin had not contributed the £5000 promised in 1855.

One must conclude that the collapse of the Grand River bridge was caused by under-scouring, or the washing-out of material from under the piers. The placement of piers in the water causes a swirling motion in the water around the downstream end of the piers. Again, to quote one of the 1858 articles, "The simple fact is that the Bridge has been built on a shoal, or loose river deposit, the piers have not had a sound foundation, they have been mined by the flood, the upper ends have sunk some three or four feet, and the masonry has cracked asunder."

### The Preston and Berlin and other nearby railways



Regardless, the P&B had ceased operation by the end of January 1858, less than three months after its opening.

In 1859, the statement was made that the Preston and Berlin line remained closed - the bridges rotting, the iron rusting, and the line altogether going rapidly to decay.

The subsidy haggles with Berlin continued in court and was finally settled in the parliament of the Province of Canada, when on October 15, 1863, an act was passed exonerating Berlin from the payment of its subscriptions of 1855 and 1857. Under this same act, Edward Irving Fergusson acquired the property and privileges of the Preston and Berlin Railway, by virtue of a mortgage previously granted him, as well as the right to sell it.

Under a deed dated November 14, 1865, the Grand Trunk Railway acquired the properties of the former Preston and Berlin Railway from Mr. Fergusson.

The 2.75-mile section of the P&B from southeast of Doon to Preston was not rehabilitated. Since this portion was on the interval lands adjacent to the Grand River, it had very little business potential.

The remaining portion (approximately 6.9 miles) of the P&B from near Doon north through German Mills to Berlin passed a number of mills and manufacturers and hence had potential as a branch line for the Grand Trunk Railway.

### The Grand Trunk Railway Doon Branch

Following its 1865 takeover, the Grand Trunk Railway apparently did little work towards putting the northern portion of the former Preston and Berlin line in shape for railway traffic. A July 1872 report states, "The Engineer of that Railway (GTR) is daily expected to inspect the condition of the old road between Doon and Berlin, and to see that it is put in proper order for the opening of the line. Some rather extensive repairs are likely to be necessary on the bridges on the old line, but otherwise we understand the road is in fair order."

During the latter part of the 1860s, there was agitation for this line to be extended southward to Galt. On June 28, 1871, the Town of Galt passed a by-law authorising an expenditure of \$25 000 in aid to the GTR to extend its line to the town. The argument in support of this aid was that the GTR would be competition for the GWR, and the people of Galt would save from 12 to 30 percent on freight shipments.

The various factions within the town of Galt did several rounds of sparring over the station location before the site on the west side of the Grand River south of Parkhill Road West near George Street was adopted. Apparently to help satisfy the parties, the track was extended south for a few more blocks to St. Andrews Park.

In March 1872, John Fergusson of Galt was awarded the contract to construct the

roadbed for the 6.2 miles of railway for an estimated \$22 573.38, which work he started on Monday, April 22, 1872. It was expected that the right-of-way, engineering expenses, etc., would add another four or five thousand dollars to this amount. By the end of May, John Fergusson had over one hundred men along with 50 carts and horses at work on the line. Wednesday, July 17, 1872, saw the inspection of the line by the engineer of the GTR, Mr. Fergusson, and Mr. O'Keefe, the engineer in charge. The result was that Mr. Fergusson was instructed to proceed to acquire 15 000 ties for the line.

In September 1872, the Grand Trunk put gangs on the line from Berlin to Doon, to upgrade the line for train operation to permit material to be brought in for the southward extension. However, the ties for the extension could not be obtained either by Mr. Fergusson or the GTR, so the expected completion of the line was delayed.

This delay provided time for a lawsuit. The town of Galt had arranged for the construction of the roadbed from Doon to Galt. The width of cuttings was made 18 feet, the same as on the old P&B, and also the width considered a Canadian standard. However, the GTR stated that their standard width for cuttings was 22 feet. Since the town couldn't get a final sign-off from the GTR, they refused to make final payments to the contractor, Mr. Fergusson. So it was off to court and finally to a board of arbitrators.

During June 1873, the Grand Trunk started laying the ties and rails between Doon and Galt. Some twelve cars of rails for the extension were shipped to Doon. The rails were laid to within a comparatively short distance of Blair by June 12. It should be remembered that these rails were being laid at the broad gauge of 5 feet 6 inches between the rails.

The town of Galt, as part of the agreement with the GTR, was to build the station and freight sheds. Work on the 30-by-38-foot station commenced on June 11, 1873.

By August 1, the track was laid into the station yard at Galt, and the engine was down daily carrying materials for the workmen. Shortly after this, it was decided not to open the line to traffic until after the pending change in track gauge – to our present standard, 4 feet 8½ inches – scheduled for October 6, 1873.

Since this gauge changeover took longer than expected, the town of Galt was given a couple of false starts for the official opening of their line.

Finally on Monday, October 13, 1873, the GTR branch was opened for freight and passenger business to and from Galt. The first train left the Galt depot shortly after 7:00 a.m. on that day, with a fair number of passengers. On Tuesday, October 14, Mr. Thomas Todd, a town merchant, had the honour of making the first shipment of freight over the new road, loading three cars of barley for Boston, and one of apples for

Glasgow, Scotland, which were taken off by the morning train.

GTR and Canadian National train service continued to Galt until early 1956, though at the end it was down to one train per week. The construction of Highway 401 in the area, across the alignment of the branch, gave the excuse to abandon the line south of Doon. This basically left the old P&B portion in operation. The 40 years since that abandonment has seen about another two miles of the old P&B abandoned. But today, almost 140 years after the Preston and Berlin was opened, CNR diesel-electric switchers still trundle over about five miles of the same alignment that the P&B used for those three months at the end of 1857.

#### **A quick look at nearby railway lines**

The first railway on the scene after the completion of the Doon branch was the construction of the Credit Valley Railway between Toronto and St. Thomas. The section which runs through Galt is presently part of the CP Rail Galt Subdivision. The first train over the Grand River Bridge, which crossed both the river and the GTR Doon branch, was on December 24, 1879. A single locomotive is said to have crossed the bridge on December 18. The CVR was leased by the CPR in June 1883.

In 1890 the Galt and Preston Street Railway was incorporated, and four years later it had constructed slightly less than five miles between the two communities. In 1895, the G&PSR undertook the construction of an extension east along the Speed River from Preston to Hespeler.

The construction of the Preston and Berlin Street Railway line between the two communities in 1903 formed the basis for the Grand River Railway and CP's electric operation along the Grand River. In our October 1991 column, we covered the 1905 squabble between the CP electric and the GTR at Seagram's plant as CP pushed their line north of the GTR into Waterloo. The Grand River Railway continued to expand and pushed a freight line across the Grand River at Galt to serve industries on the western bank in 1907. The final main link in the railway network along the Grand was the construction in 1912 of the Lake Erie and Northern Railway south of Galt.

The GRR rail line along the Highway 8 median in Kitchener was relocated in 1961. Following this relocation, the GRR had running rights over a portion of CN's Waterloo Subdivision. While there are many more stories and details of the railways along the Grand River, I will close with this relocation, which in theory put the Preston and Berlin Street Railway operation on the old Preston and Berlin Railway.

While this story has been a long time in the mill, I would like to thank all who have spent time with me discussing these lines, and especially to Ray Corley and George Roth for their comments.

**Bill McGuire's**

## **Diesel Locomotives**

This column will complete our look at the electrical system of a diesel locomotive. Three components remain to be examined: the reverser, the traction motor, and the armature, which is essentially the core of the traction motor.

The reverser is an electrically-controlled power switch which connects the traction motor fields for either forward or reverse armature rotation. The power to operate the reverser is either pneumatic (air) or magnetic. When the reverser lever on the control stand is moved to either the forward or reverse position, the interlock on the reverser closes to activate either the forward or reverse magnet valve. The magnet valve opens to admit control air to the operating piston, causing the reverser to move to either the forward or reverse position. The reverser-handle movement will automatically establish circuits using local current to activate the heavy-duty electromagnet switch gear.

All modern locomotives have either four or six traction motors. They are located between the engine wheels and rest on the axle. There are two main parts to the traction motor: the armature and the frame.

The armature is the rotating member of the motor and is the component that performs all the work. The armature coils are the part of the armature which carry the current and cause rotation. They are held on the armature core by steel or glass banding. This banding determines the rotational speed of the motor and thus the maximum speed of the locomotive (depending on the traction motor gearing).

The commutator portion of the armature carries the load current from the brushes to the rotating armature coils. Each copper segment must be electrically insulated from the rest and from the armature shaft. Load current is conducted to the armature by brushes which are held in contact with the rotating commutator by springs.

The armature is supported in the traction motor frame by the armature bearing. The frame contains the field coils and also forms the mounting arrangement for the motor on the axle and in the truck. The bearings which carry the traction motor on the axle are called support bearings. There are two bearings, one at each end of the motor, riding on a specially machined surface of the axle adjacent to each wheel.

The major portion of the traction motor's weight is carried by the support bearings on the axle. There are no springs nor any shock-absorbing arrangement between axle and bearings. The motor rides directly on the axle, so all road shocks are transmitted directly to the motor.

In the next column, we will move to the wheels and trucks of a locomotive, and also discuss the problem of wheel-slip.