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Workington Bridge looking south west. The coke train contains a mixture of NER and private owner wagons. The nearest appears to belong to Pease and Partners Ltd of Darlington. Wagons from this company appear in the background of a number of Cumbrian images. Although the NER had its own dedicated wagons for the West Cumberland coke traffic, much of it was carried in wagons belonging to the ironworks, to the Durham collieries and to wagon rental companies based in the Darlington area.

CRA, Peter Robinson Collection.

Coke to Cockermouth

Dave Richardson

The Requirements of the West Cumberland Iron Industry

If you wish to smelt iron, you need iron ore (of course), limestone to act as a flux and coke as a fuel. Although the first two were abundantly available in west Cumberland, one of the handicaps suffered by the early iron producers in the area was the absence of a local source of suitable coke. Local coal was of course readily available in west Cumberland and some of it was converted into coke for domestic and general industrial use. Unfortunately, the coke produced was generally unsuitable for iron smelting, having a high phosphorous content and tending to be soft and easily crushed when tipped into the blast furnace. Good quality smelting coke was of course readily available just over the Pennines in County Durham. Low in phosphorous and with excellent mechanical strength, the Durham coke was ideal for the job and in west Cumberland it became the industry standard. Indeed, one of the principal reasons for the construction of both the Stainmore line and the CKPR itself was to facilitate the movement of coke between Durham and the blast furnaces on the west coast. However, importing coke

from further afield was expensive and to some extent, this offset the commercial advantage of being able to source iron ore and limestone locally. By careful management of the coking process, it was in fact, possible to produce suitable smelting coke from the west Cumberland coal. However, the technical difficulties meant that this was not carried out on a large scale. Nevertheless, acquiring the ability to produce large quantities of usable coke from the local coal, was correctly perceived a means of increasing profitability. In the final quarter of the 19th century, a number of the Cumberland iron smelting companies acquired or sank their own collieries, erected coke ovens and attempted to produce a useable product from the locally mined mineral.

As late as 1907, five sixths of the coke used in the blast furnaces in west Cumberland, still came from Durham. However, in the preceding years there had been steady improvements in coal preparation and coke oven technology. The cumulative effect of these meant that by the end of the first decade of the 20th century, for the first time, it became possible to produce large quantities of satisfactory

smelting coke from the west Cumberland coal, at a competitive price. From 1907 onwards there seems to have been a dash to invest in the new technology. In the years leading into the Great War, banks of modern ovens were installed at Risehow, St Helens, Harrington, Moresby, Allerdale, Whitehaven and Oughterside collieries. Eventually there were some 409 of these ovens supplying 12,000 tons of coke per week, all of which was consumed in the local blast furnaces.

The increasing consumption of local coke inevitably meant that the traffic from Durham gradually dwindled away. However, the coke traffic over the CKPR increased during the Great War, owing to the unprecedented demands made on the west Cumberland iron producers as part of their contribution to the war effort. The harsh commercial climate of the 1920s saw the closure of most of the ironworks in west Cumberland and by 1930 only two remained. With an overabundance of local coke ovens and the need for the surviving companies to cut costs wherever possible, the use of the more expensive Durham product simply became commercially unattractive.

Working the Trains

The CKPR was slightly unusual in that whilst it was a wholly independent concern, all the trains on the line were operated by two other companies. The LNWR handled the goods and passenger services while the NER took care of the mineral traffic. From the latter company's perspective, this, overwhelmingly, meant through trains heavily loaded with Durham coke, plodding slowly westwards, with corresponding trains of empties returning east.

The coke trains travelling westwards from Kirkby Stephen, reached the Lancaster and Carlisle line via the NER's Eden Valley route. Then, after a short run of just over two miles northwards towards Penrith, they left the L & C at Eamont Bridge Junction to traverse the Redhills curve. This isolated section of the NER was opened in 1866 and enabled the coke trains to reach the CKPR without reversing. After passing under the CKPR, the NER trains finally came up onto the Keswick line proper at Redhills Junction.

By any standards the route from east to west was not an easy one to work. Apart from the well know climb up to Stainmore (1370 ft.) the CKPR had its own summit at Troutbeck (889ft.). The working of heavy trains of loose coupled wagons over such hilly terrain required considerable skill, care, co-operation and physical endurance. It is perhaps not surprising that the NER coke trains seem to figure disproportionately in the reports of accidents on the CKPR.

By 1882, the double loading of the coke trains appears to have been well established. Utilising two engines and two brake vans, a load equivalent to twice the limit for one engine would be brought

over the Stainmore summit and then taken forward to Cockermouth by engines from Kirkby Stephen shed. When taking the train up to the summit at Troutbeck, the assisting engine would push from the rear to guard against the possibility of runaways. Once on the summit, as well as stopping to pin down the wagon brakes, the assisting engine would be placed on the front of the train. This would avoid any strain on the couplings whilst braking on the descent. This practice of having the assisting engine at the rear on rising gradients and on the front when travelling downhill was also followed on the Stainmore section of the route.

Using two engines with two crews and two brake vans with their respective guards to move a double load did not produce any cost savings. However, it did reduce the number of train paths taken up by the slow moving mineral trains, which tended to get in the way of faster moving traffic. This was particularly relevant on the CKPR which, for the first 30 years, was single track throughout. The NER does appear to have regarded the line as something of a bottleneck and during the early 1880s, at times when the demand for coke was especially heavy, the company made several requests to the CKP Board to make the line available for night working so that additional trains could be run during the hours of darkness. It was not until 1894 that the first stretch of the CKPR, the section between Threlkeld and Troutbeck, was doubled. This of course was the western side of the Troutbeck summit. The section between Troutbeck and Penruddock on the other side of the hill, followed seven years later and the new double track formation was opened for traffic on 1st June 1901.

The Cumbrian Railways Association holds an excellent run of working timetables (WTT) covering the CKP line for the pre-grouping period and these show a fairly consistent pattern of between two and four coke trains in each direction on weekdays (Monday to Saturday inclusive). Although there are some references in the WTTs to the double loading of coke trains, it is unclear whether particular trains carried a single or double load. It is likely that when the iron works were operating at or close to full capacity, double loading was the norm. However, the iron industry was subject to periodic cycles of depression. At these times, some of the furnaces would be damped down with a resultant reduction in the demand for coke. During these periods, it is likely that single loading would have sufficed for the number of train paths available in the timetable. The WTTs also show that at different times, one or more of the daily trains was conditional, i.e. it would only run providing there was sufficient traffic available. This arrangement gave the railway companies some degree of operational flexibility when handling the variable volume of this traffic.

Although we tend to associate the NER trains solely with the carriage of coke, this is not quite the full story and an examination of the WTTs reveals that other mineral traffic was also hauled by the NER. The WTT for July-September 1903 shows that there was a daily eastbound NER coal train and provides the following information:

... will bring coal and lime from Cockermouth for CK&P stations and pick up empty wagons for east. All wagons of lime to be immediately placed on the drops.



NER 1001 class No. 1184 pauses at Keswick station, probably in the late 1890s. This particular engine had been allocated to Kirkby Stephen shed by 1882 and was also involved in an incident at Keswick station in 1896 when she was derailed to avoid collision with an LNWR passenger train. No. 1184 is therefore likely to have been a regular performer on the coke trains over quite a number of years.

CRA D F Tee Collection.

There was a corresponding westbound working designated as a NER coal and mineral train and again the working timetable provides additional information:

...down mineral will bring coal from Clifton and lime from Redhills lime works for CK&P stations and pick up empty wagons for west at all stations.

Redhills lime works and quarry had its own siding which had a trailing connection from the down line of the Redhills curve. It was therefore served exclusively by the NER. All of this indicates that by this time some Durham coal was finding its way across the Pennines to supplement the locally mined west Cumberland product, at least at some of the CKPR stations east of Keswick. However, the NER was also bringing coal eastwards from Cockermouth (presumably mined at West Cumberland pits) for stations east of there. This pattern is repeated in the WTT effective from July 1911.

During the Great War the arrangements for the handling of the coke traffic do not appear to have changed significantly and in 1916 and in 1917 there were three NER trains, now described as "mineral", in each direction. Of the three, two of were through trains, both of which were also conditional. The description of these trains as "mineral" makes it difficult to decide whether they carried coal or not, although it is very likely that the through trains consisted solely of coke wagons, running straight to their destination. It might be expected that during the difficult war years, as much coke as possible would be transported over the CKPR in order to keep the furnaces of west Cumberland supplied. However, the service of three trains in each direction, two of them conditional, does not appear to support this.

Harold Bowtell's book, *Rails Through Lakeland* provides figures of coke tonnage carried over the CKPR in the years 1900 to 1918. These need to be interpreted with caution as they are affected by episodes of industrial action and by the cyclical periods of "boom and bust" prevalent in the iron trade. However, it is clear that the coke traffic over the CKPR increased significantly during the war years, but even at its height (in 1918, with 111,935 tons) it was only around half of the substantial quantities carried during the busiest periods at the turn of the century. It is likely that the steeply graded route with its sections of single line and, above all, its weight restrictions, discouraged any attempt to significantly increase the tonnage of the coke traffic passing over it. Especially since much of the east-west coke traffic could be and indeed was, routed via the Newcastle and Carlisle line and then over the MCR. It is instructive to note that during the Great War, the LNWR made overtures to the CKPR, wishing to introduce heavier goods locomotives on the line but the CKPR board could not see their way to carrying out the necessary strengthening work on the bridges.

It should be mentioned at this juncture that in 1917, the government reorganised coal traffic across northern England with



NER 1001 class No 1183 trundles slowly into Embleton station in order to facilitate the exchange of tokens. The visible portion of the train appears to consist of NER Diagram R5 coke wagons. The history of these vehicles was extensively documented in an article by Richard Lacey which appeared in the CRA Journal Vol 8 No 12.

North Eastern Railway Association.

a view to making the most efficient use of the resources available. As a result of these arrangements, traditional traffic flows were suspended and large quantities of coal from Durham and Northumberland were carried to both west Cumberland and the Furness peninsula. The limited documentation which exists in relation to these arrangements shows that the additional trains from the NER were routed either via the Newcastle and Carlisle line and onto the MCR, or, taken over Stainmore to Tebay. There is no evidence that the CKPR was utilised for any of this additional traffic.

A perusal of the WTT effective from 1st March 1919 reveals that by this time the frequency of the coke trains had reduced slightly. There are now just two daily NER trains in each direction and one of these, again in each direction, is conditional. This pattern is repeated in the WTT for 1921. Although the possibility of double loading tends to muddy the waters slightly, the reduction in the number of trains must surely be an indication that the coke traffic

had reduced considerably by this time. The introduction of modern coke ovens at many of the west Cumberland collieries in the run up to the Great War, would have significantly reduced the Durham coke traffic over the CKPR. However, the impact of this was mitigated by the unusual conditions which pervaded during the war years. With the war over and things returning to normal, the declining nature of the traffic would have become more apparent. During the 1920's this decline would of course have been exacerbated by the gradual closure of most of the ironworks. Writing in *Over Shap to Carlisle*, Harold Bowtell recounts that the traffic continued until 1926 when it was suspended, almost certainly as a result of the long coal miner's strike which followed the General Strike in that year. It was not resumed, except for a brief period for several months in 1928 when industrial action halted production at the west Cumberland coke ovens and once again it became necessary to import coke from county Durham. However, writing a little later in *Rails Through Lakeland*



Kirkby Stephen probably about 1905. This image perfectly captures the essence of the double load coke trains. The locomotives Nos 889 and 670 are both members of the NER's 398 class. These seem to have replaced the 1001 class at Kirkby Stephen shed in the early years of the 20th century. The train itself appears to consist of a mixture of NER and privately-owned coke wagons.

North Eastern Railway Association, Valentine Rippon Collection.

he is slightly more equivocal, referring to a photograph of a double headed coke train taken by D S Barrie near Eamont Bridge Junction seemingly in 1929. The Redhill Curve remained in situ until 1938 and does appear to have been used from time to time for turning locomotives and by excursion trains travelling to or from the CKPR. In theory therefore it was available for any Durham coke traffic, but there is no evidence that it was used for this purpose after 1929.

The NER coke and mineral trains commenced or terminated at Cockermouth Junction, immediately to the west of the goods yard there. There was not a visible junction here, as such, but this was the point at which the metals of the CKPR met with those of the of the old Cockermouth and Workington Railway (CWR) which had been absorbed by the LNWR in 1866. An LNWR document from 1920 provides details of the sidings at the junction which were provided for the reception and dispatch of the coke traffic. On the up side, there were two sidings for marshalling traffic. The first, named appropriately Stockton Siding was designated for traffic for the NER line and coal for stations on the CKPR. The second, named Keswick Siding, was designated for other traffic for the CKPR line and anything for exchange at Penrith. On the down side there were three sidings. The first two (named No.1 and No 2 Sidings) were for the reception of laden

coke trains from the east. The third, known as Bank Siding, was used for inbound coke traffic but also for coal empties coming from the CKP line and onto LNWR and MCR lines.

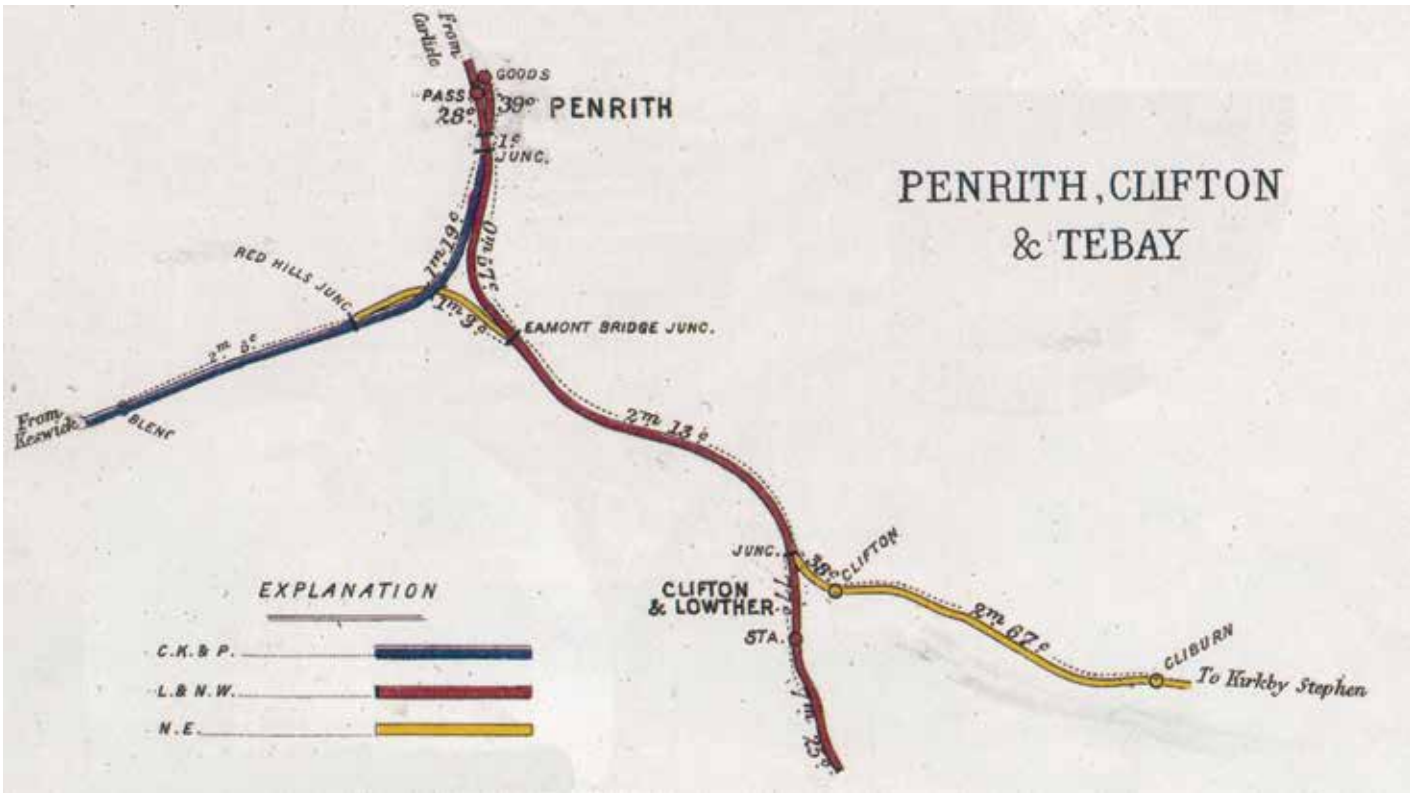
By 1920, as part of the arrangements for controlling the goods and mineral traffic in the area, regular reports were provided throughout the working day to the Regulator's Office of the number of wagons on hand at Cockermouth Junction for the following ironworks: Distington, Cleator Moor, Moss Bay, Derwent, Oldside and Harrington. These would have been, almost exclusively, loaded coke wagons which had been brought from Durham by the NER. Regular reports were also made in respect of the number of wagons for different destinations, on hand in the sidings at some of the ironworks. The lists of destinations are interesting in so far as they appear to confirm that at this time, at least some of the ironworks were using a mixture of coke from both the Durham and the local ovens in their blast furnaces. The report also differentiates between empties for the NER line travelling via the CKPR and those travelling via the LNWR and MCR to Carlisle, providing a further reminder that in fact, only a portion of the West Cumberland coke traffic was routed via the CKPR.

From Cockermouth Junction, the coke appears to have been delivered to its various destinations via a series of local trip workings. However, the position is

complicated, because at least some of this traffic was handed over to the CWJR to complete its journey. Furthermore, the WTTs do not usually identify the type of traffic carried by a particular working, so it is not possible to obtain a complete picture of how the coke arrived at its final destination.

NER Engine Sheds and Motive Power

In the early days it appears that Shildon shed provided the NER locomotives which ran over the CKPR. It was customary for loaded trains to be worked from south Durham straight through to Cockermouth. The crews would then service the locomotive, turn it on the turntable at the station and then return eastwards with a train of empties. This was apparently accomplished in a single shift of 16 hours or more. At this time therefore, there was no necessity for the provision of engine stabling facilities for the NER at the western end of the route. However, right from the very beginning there appears to have been some sort of agreement that the CKPR would provide accommodation for NER locomotives if the latter requested it. In fact, there was already an old CWR engine shed at Cockermouth, and this appears to have been utilised by the LNWR for stabling its own locomotives until the opening of their new six road shed at Workington in 1876. By 1878, plans were afoot to convert the redundant building into a much-needed



goods shed and the contract for the work was agreed in 1881 between the LNWR and Mr Boulton the original contractor for the CKPR.

With the introduction of block signalling along parts of the NER route (which extended the journey time) and reductions in the length of the working day, it became necessary to split the return journey over two shifts. Crews working in from Shildon would therefore end their shift at the western end of the route and then rest, before beginning a fresh shift for the return journey. In 1875 the NER wrote to the CKPR to ask if they would be able to supply accommodation at Cockermouth for two locomotives. It is unclear as to whether any action was taken as a result of this request, but in 1880, the NER wrote again to the CKPR requesting that they provide accommodation for three NER engines engaged in the coke traffic. The obvious thing would have been to utilise the old CWR engine shed and this is what may have happened at some point, but by 1880 of course, the LNWR had plans to convert this into a goods shed. After some discussion, the LNWR offered the NER temporary accommodation at their recently opened shed at Workington. However, the NER engines did not work beyond Cockermouth junction and the company declined the offer, because it would involve too much light running between Cockermouth and Workington. Some attempts were made by the Cockermouth Station Joint Committee to establish a site for a new shed specifically for the NER. However, in 1881 the latter company decided not to proceed with the project, preferring instead to change engines and crews at Kirkby Stephen. In this way, the shed at Kirkby Stephen assumed much greater importance, becoming in effect a locomotive staging post for the east-west coke traffic. It provided the power for the

Cockermouth trains and shared the Tebay run with the engines stabled at the NER shed there.

The coke trains from Durham were originally in the hands of the short coupled, long boilered goods engines which had dominated goods and mineral traffic on the old Stockton and Darlington Railway. Engines of the same basic design were built between 1852 and 1875, by various contractors as well as by the S & D and NER works at Shildon and Darlington respectively. One batch ordered in 1859 was built specifically for use on the soon to be opened line from Barnard Castle to Tebay. These were more powerful than previous members of the class and were fitted with what were at that time regarded as large cabs to protect the crews from the extremes of the Winter weather over Stainmore. By 1885 Kirkby Stephen shed's freight engine allocation consisted of seven examples of this class of locomotive. Although replaced on the Stainmore route in the late 1880s they continued to be used on the trains from Kirkby Stephen to Cockermouth, certainly into the early years of the 20th century. In 1895 the NER included all these engines in the 1001 class and at that time there were still 192 of them in service. Although modernised over the years, to some extent, by the application of standard NER boilers and fittings, their close coupled wheelbase and spartan cabs gave them a rather antique appearance. No 1275 is of course preserved in the national collection and represents one of the class as first built.

With the disappearance of the 1001 class from the CKPR after the turn of the century, other classes of NER 0-6-0 were transferred to Kirkby Stephen and used on the coke trains. The use of the Fletcher 398 class on these trains is well attested and these seem to have replaced the older locomotives as the latter were transferred

from Kirkby Stephen. This was a large, and relatively diverse class of locomotive, being constructed at Gateshead, Darlington and York as well as by outside contractors, between 1872 and 1884. Across the class, the appearance of individual locomotives varied, with different types of cab and tender and even different driving wheel diameters.

In July 1906 the CKPR board agreed to accept the NER's C and C1, 0-6-0 classes of locomotive over the line, although this necessitated work on strengthening some of the bridges which the engineer estimated would cost £80. These were amongst the NER's standard classes of goods engine, although with their 5ft 1inch diameter wheels, they had a turn of speed and were consequently found on some passenger workings. The C class were two-cylinder compound engines and the C1 was the simple, non-compound version. However, following extensive trials, all the compound engines were converted to simple between October 1901 and March 1913. These engines were reclassified as J21 in LNER days. In 1920 an observer at Keswick noted the use of both the C1 and 398 classes of locomotives on the coke trains, both types of engine being identified with Kirkby Stephen shed.

This general picture is confirmed by a locomotive allocation list for Kirkby Stephen dated 31st December 1920. On the freight side of operations, the shed had six class 398, two class C and one class P1 (J25 under the LNER classification). There were still five members of the 398 class at Kirkby Stephen in 1923, but from this point on, the numbers reduced, the last one being transferred to Wear Valley Junction in June 1927. The mention of a solitary example of class P1 is interesting. These engines were broadly similar in appearance to the C1 class but with 4ft 7 in diameter wheels. Peter Walton's



Redhills Junction looking east about 1935. The NER Redhills curve diverges from the CKPR off to the left. The line then descended to pass underneath the Keswick line and join the L & C at Eamont Bridge Junction. A closer inspection of the print reveals that the tops of the rails on the NER curve are dark with rust, indicating little or no use by this date.

CRA, Pattinson Collection

book *The Stainmore and Eden Valley Railways* contains an undated account by J W Armstrong of a footplate trip over the Stainmore route. In it, Armstrong makes reference to seeing P1 No 1866 at Kirkby Stephen, making ready to leave for Cockermouth with a mineral train.

There is one final aspect of NER motive power over the CKPR which requires discussion. The deployment of the new T and T1 classes of 0-8-0s on the Durham-Tebay coke trains in 1902, revolutionised the workings over Stainmore. These handsome and powerful engines could take 27 loaded coke wagons unaided over the summit as opposed to only 16 by the older 0-6-0s. In addition to this, the NER began to utilise one 20-ton brake van to replace the two, ten-ton vans formerly used on the double loaded trains. The savings in engine mileage and wage costs were significant, and consequently, the NER was keen to extend these new working practices as far as possible. In February 1904, Wilson Wordsell, the NER's Locomotive Superintendent, approached the CKPR board seeking their agreement to begin using the "T" class on the coke trains as far as Cockermouth. The board responded by requesting that the NER make a contribution to the costs which would be incurred in strengthening the bridges to accept the heavier engines and suggesting that this could be covered by making a reduction in the percentage of the receipts from the mineral traffic which was paid by the CKPR to the NER. Wordsell however,

was having none of this and replied saying that the CKPR should be strengthening its bridges as a matter of course and that this was essential if the company was to earn revenue under modern conditions. There the matter rested, but in 1906 the CKPR's engineer did prepare an estimate of costs for strengthening the bridges to take the larger engines. However, the board seems to have taken fright at the proposed expenditure and decided not to proceed. Consequently, the coke workings over the CKPR continued in the time-honoured fashion, although it is possible that single 20-ton brake vans began to put in an appearance on the double loaded workings.

So, there it is, the story of an almost forgotten traffic that once brought NER engines into the heart of northern

Lakeland. Although we've looked at the coke trains which travelled over the CKPR, this is of course only a part of the story of coke coming into west Cumberland. There was a significantly heavier traffic over the MCR, much of it coming from the NER via their Newcastle and Carlisle line. However, at various times there were also trains of Scottish coke coming via the Caledonian or North British railways. These found their way onto the MCR, either by exchange at Carlisle, or via the NBR and Caledonian lines south of the Solway Firth. This is an untold story and at the present time the details are fragmentary. However, it would form an excellent subject for a future article.

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