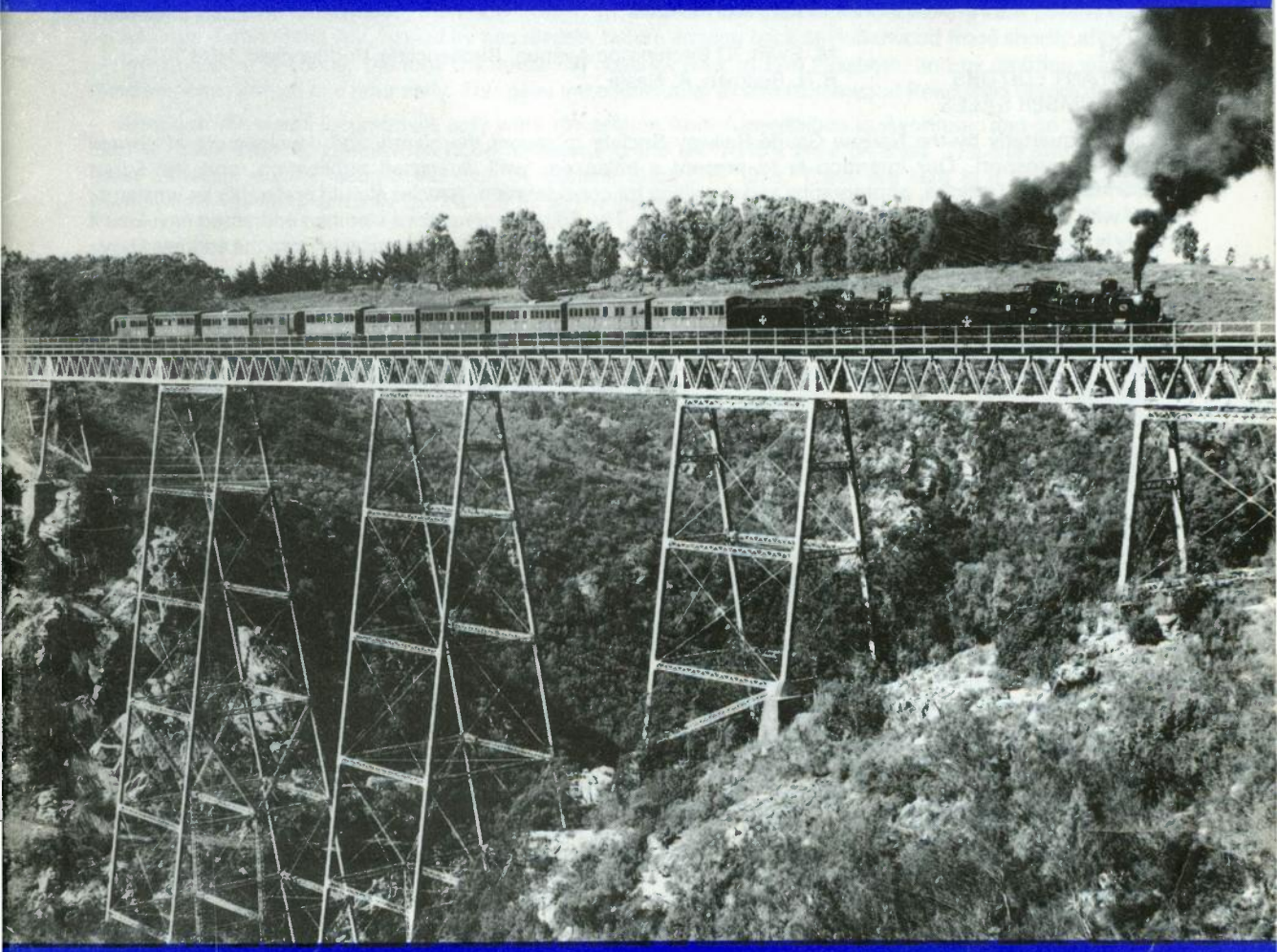
THE NARROW GAUGE

No.86



NARROW GAUGE RAILWAY SOCIETY

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Serving the narrow gauge world since 1951

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The Society was founded in 1951 to encourage interest in all forms of narrow gauge rail transport. Members interests cover every aspect of the construction, operation, history and modelling of narrow gauge railways throughout the world. Society members receive this magazine and Narrow Gauge News, a bi-monthly review of current events on the narrow gauge scene. An extensive library, locomotive records, and modelling information service are available to members. Meetings and visits are arranged by local areas based in Leeds, Leicester, London, Malvern, Stoke-on-Trent and Warrington. Annual subscription £5.50 due 1st April.

THE NARROW GAUGE

ISSN 0142-5587

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BACK NUMBER SALES :

Published quarterly by the Narrow Gauge Railway Society to record the history and development of narrow gauge rail transport. Our intention is to present a balanced, well illustrated publication, and the Editor welcomes original articles, photographs and drawings for consideration. Articles should preferably be written or typed with double spacing on one side of the paper only. The Editor appreciates a stamped addressed envelope if a reply is required. A range of back numbers, and binders for eight issues are available from the address above.

Printed by Hadfield Print Services., Mount Pleasant Street, Ashton-under-Lyne. Lancs.

EDITORIAL

No 86 WINTER 1979/80

Civil engineering works, and particularly the construction of reservoirs, created some spectacular narrow gauge railways in Britain between 1890 and 1940. Most of these were only in operation for a few years, but are now being documented in a series of Oakwood Press publications by Harold D Bowtell. The second in this series, *Reservoir Railways of the Yorkshire Pennines,* spurred your editor to work up an appetite for Christmas dinner by walking the formation of the 3ft 6in gauge line to Green Withens reservoir. Although lifted more than 80 years ago, the route is still well defined with some spectacular sections, and it was easy to imagine the contractor's locomotive, JACK TAR, blasting up the steep gradient beside a rushing stream. This Manning Wardle later went to help build the Beira Railway in East Africa, and is now preserved in Zimbabwe-Rhodesia.

A few of the contractors railways were retained to provide access for maintenance, and the Llyn Cowlyd Tramway is probably one of the most interesting. Its location in the mountains of North Wales ensured that it became known, but few ever saw the line, and hardly anyone observed it in operation. The article in this issue has been in preparation for eight years, but I am disappointed that only one photograph of a train turned up.

The article on "The Harlech Tramway", by D Clayton in No 84 brought some additional information from members, now published in Mail Train. If a short line such as this creates so much interest can I hope for an even greater response on Llyn Cowlyd?

Cover: A pair of SAR 2-8-2 locomotives cross the famous Van Staden's bridge, the highest narrow gauge bridge in the world at 250ft above the river, with the RSSA special train described in this issue by Peter J Martin. A E Durrant, who took the photograph, was almost deafened by the clash of massed camera shutters, but by some miracle nobody got into the picture!

THE APPLE EXPRESS

Peter J. Martin

In April 1979 the Railway Society of Southern Africa ran the "Sunset Limited", their most ambitious rail tour to date. Over ten days 24 spotless steam locomotives of thirteen different classes were involved in hauling the train more than 2000 miles. The outward route from Johannesburg was through Kimberley and De Aar to Port Elizabeth, thence via Klipplaat and the Montagu Pass to Mossel Bay. The return route included the climb over Lootsberg summit (5727 ft), continuing past Bloemfontein to Johannesburg. Two nights were spent in Port Elizabeth, and tour members were able to travel on the 2ft gauge "Apple Express" on Easter Sunday.

There is no regular passenger service on the line from Port Elizabeth through the fruit growing areas of the Langkloof to Avontuur. The "Apple Express" is a tourist train, which normally runs on Saturdays from June to January, but a special working was provided for "Sunset Limited" passengers. The excursion commenced at 08.00 from Humewood Road station, Port Elizabeth, behind two class NG15 2-8-2 locomotives. The train climbed westwards, and made several brief photographic stops before reaching Van Stadens Gorge two hours later. After a stop for the locomotives to take water a run past was arranged on the spectacular Van Stadens Bridge, 250ft above the river. The line continues to climb to Summit station, 747ft above sea level, then in eight miles descends 647ft to the Loerie Valley. Just after midday the train reached Loerie, 45 miles from Port Elizabeth, the normal terminus of the "Apple Express", although the line continues for another 132 miles to Avontuur.

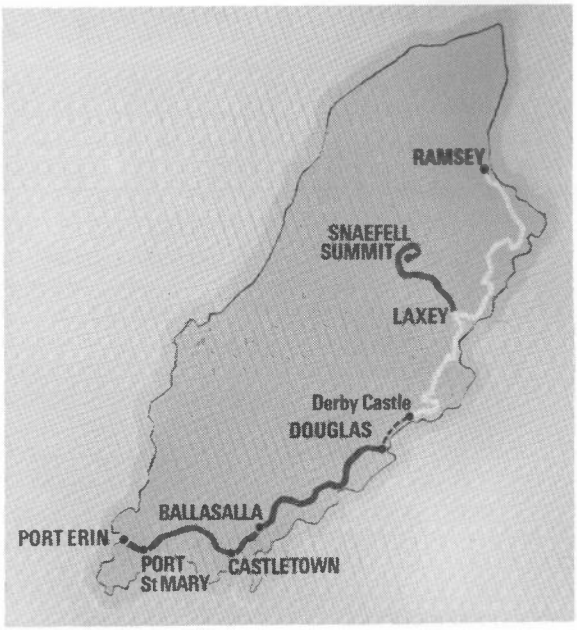
At Loerie a picnic lunch was provided, after which the train was divided. 124 took four coaches along the Avontuur main line to Gamtoos, then down the 17 mile branch to Patensie. The returning train passed the only freight noted during the day, hauled by two diesels, before arriving back at Humewood Road shortly after 22.30. After two hours at Loerie, 146 took the remaining coaches back to Port Elizabeth, and by omitting some intermediate stops arrived one hour early. This gave the opportunity to visit Humewood Road shed before dark.

Although the steam locomotives only work the section from Assegaaibos to Avontuur, and on the Patensie branch, they return to Humewood Road for servicing and six NG15's were on shed. The line also has twenty class 91 diesel electric locomotives built by General Electric in 1973. These are kept in a separate depot at Humewood Road and normally work all traffic on the line as far as Assegaaibos.

Almost within sight of the Indian Ocean, 124 and 146 climb out of Humewood Road in a pastoral setting within the Port Elizabeth suburbs. *(A.E. Durrant)*

A MANX EXCURSION

Roy E. Wright



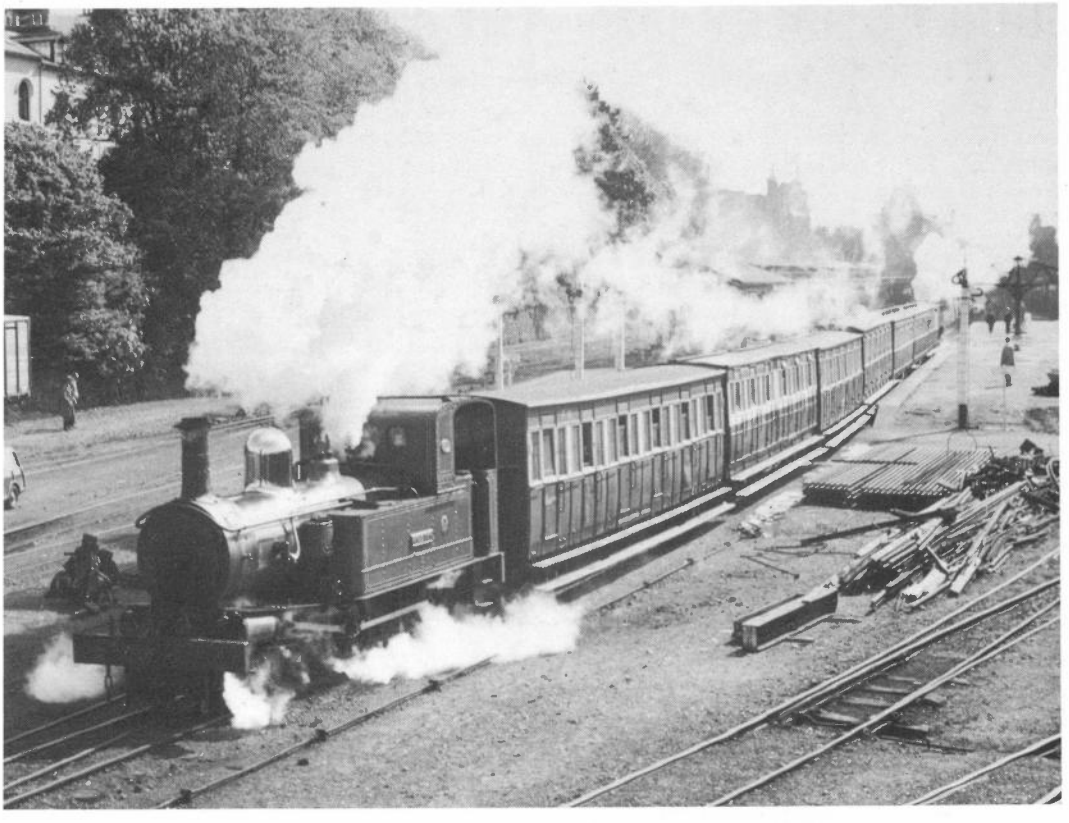
Having visited all the Welsh narrow gauge lines several times, it seemed that the next nearest, at least as the seagull flies, was the Isle of Man Railway, and when I learned that there was to be a Sunday excursion in July I examined the timetable to see how much I could pack into four hours ashore. The steamer from Llandudno was due to arrive in Douglas about 1.15pm, and the steam train departed at 2.10, which allowed plenty of time to transfer from the pier to the station. I laid my plans. First, a ride to Port Soderick, returning on the 3.02 to arrive in Douglas at 3.15. Then by horse tram to Derby Castle station, for the Manx Electric Railway at 4.00 to Onchan, back to Douglas at 4.45, leaving 45 minutes to stroll back along the promenade to the boat at 5.30.

The great day arrived, I loaded up my cameras, binoculars, O.S. map and guide book from the local library, and enough food for the day. My schedule allowed no time for relaxing in cafes of course. Looking like a cross between a pack-mule and a Japanese tourist, I parked the car as close as possible to the pier in Llandudno, (there are no trains or buses before mid-morning on a Sunday), and was on board the MANXMAN in good time. There was little shipping to be seen and after the Great Orme faded from view there was nothing to do but keep an eye on the watch, and wonder how long it would be before I caught the first glimpse of Man.

We sailed into the scenic Douglas Bay in sunshine, and docked about 15 minutes late, but no matter, I still had plenty of time. The first thing that meets the eye as you leave the steamer terminal is an Isle of Man Railway carriage, now being used as the railway information bureau. I collected a few brochures, then sped hot-foot to Douglas station, a very impressive building. Inside were a dozen or so passengers at the booking office, then onto the platform where No 13, KISSACK,was waiting to leave for Port Erin. Time for a photograph, then away, climbing out of the island capital into pleasant rural scenery. I managed to eat a sandwich or two before the sea came into view on the left, where another steamer could be seen heading for Douglas from the south, possibly an excursion from Dublin.

Port Soderick station building was boarded up and out of use, but the stationmaster was there at attend to the points because some trains cross here. I had about 35 minutes before the train back to Douglas, so took a short walk as far as the top of the steep hill leading down to the sea, then returned to the station for a chat with the staff, who told me that three locomotives, No 4 LOCH, No 11 MAITLAND, and No 13 KISSACK were in steam for the day. When the train arrived No 11 was in charge.

It's mostly downhill to Douglas, and after leaving the train I bought a booklet or two from the sales counter, then strolled along the North Quay and back to the steamer terminal, which is the terminus of the horse trams. It is a gentle 20 minute amble along the promenade, giving plenty time to admire the view of the bay. I got an outside seat on the toast-rack tram, noting as we went the variety of accents from the other passengers, a mixture of Northern England, Glasgow, Dublin and so on. We had been the first to arrive, but a glance over the right shoulder showed that there were now five of the Steam Packet Co boats in the harbour. All Britain and



KISSACK leaving Douglas station with a seven coach train for Port Erin, the maximum load for one locomotive. *(Manx Press Pictures)*

Ireland were coming for a ride!

As we approached Derby Castle station, a Manx Electric tram started to climb to Onchan Head at a time that was not listed in the time-table, but it appears that the service as far as Laxey is augmented as required during the high season. The horse and electric trams use the same terminal, still called Derby Castle station, though that is long gone, and Summerland has taken its place. Onchan is just 'round the corner'. Though in effect a suburb of Douglas, it is now the second largest place on the island, and has its own little harbour, parks and amusements. Trams were returning to Douglas every few minutes, and all seemed well filled in both directions. In fact I found three two-car sets at Derby Castle, waiting to return up the hill to Onchan. There was plenty of time left for a stroll along the promenade and beach back to the sea terminal, being passed every few minutes by another horse tram, also well filled. The horses, I was told, only make two return trips before being replaced. After a dull spell in the afternoon, we left port in sunshine again, and I was well satisfied with my day out. I had photographed four of the steam locomotives, two out on the line, and 5 and 6 awaiting overhaul in Douglas station, and about eight assorted trams.

This excursion operates on most Tuesdays and Wednesdays during the summer season, and also on a few other days. The Manx Tourist Board will supply details and railway timetables. It makes a fine day out for the narrow gauge enthusiast in North Wales, and there are a number of options open in Douglas. If one does the whole trip on the steam railway there is about 25 minutes available to see the museum at Port Erin. Alternatively the Manx Electric can be taken to Ramsey, where they too have a museum, or again a change may be made at Laxey to the Snaefell Mountain Railway. The trip to the summit takes about half an hour each way, and they have enough single tramcars to run a service of ten minute frequency in the high season. On a few days with unusual tides you may get more than four hours ashore, perhaps as much as 5½ hours about once a year, but one can see plenty in four hours. I intend to repeat the trip for more Manx narrow gauge, why don't you?

REBUILT DURLEY 1979—THE STORY OF "WENDY"

Paul Hitchcock

Fifteen yours on a Welsh hillside had hardly improved WENDY's already doubtful condition. Her abandonment in 1946 had been prompted by a fractured main steam pipe, and although a start had been made to fit a crude external replacement, it was never completed. Evidently by that time the work available at the quarry was within the capacity of the horse which superseded the loco!

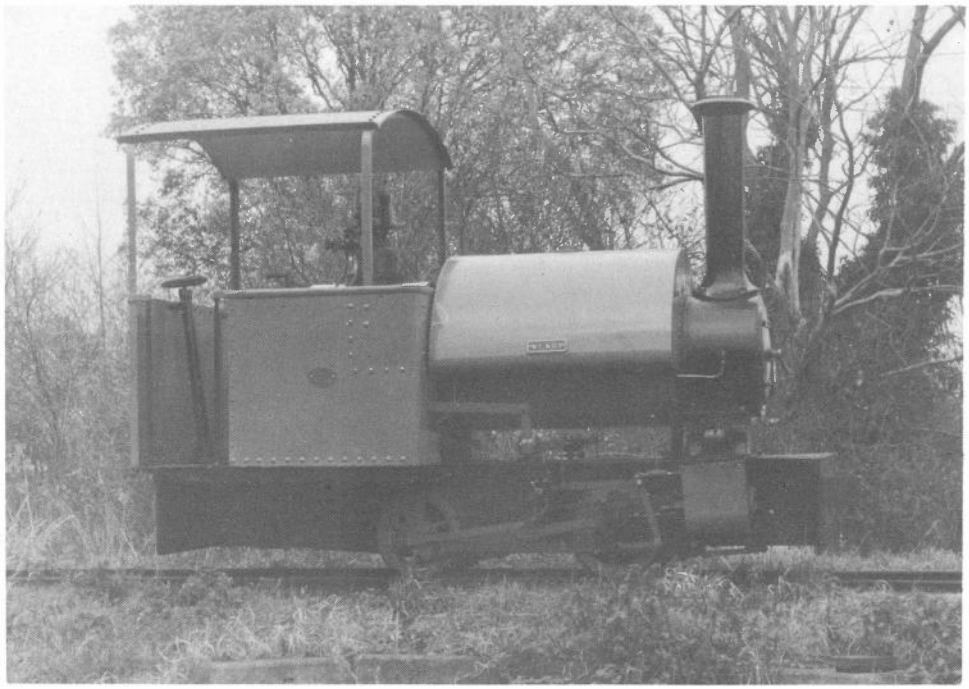
It has proved difficult to establish the details of WENDY's career since W G Bagnall completed her as works number 2091 in 1919. It has been suggested that she formed part of a batch for general sale, together with the two Minworth Sewage works engines, 2087 and 2088; Cadeby Light Railway PIXIE, 2090; and a long defunct 2ft 6in gauge example, 2089. Suffice it to say that the pipework arrangement drawing does not suggest that this was the case, although there was a batch of six 2ft gauge machines from 2090 to 2095. This seems to be a problem for the Bagnall specialists to solve.

We first learn of WENDY at the Votty & Bowydd Slate Quarry, Blaenau Ffestiniog where, heresay has it, she became disused as early as 1921. Around 1929 she was transferred to the Dorothea Slate Quarry, Nantlle. At one of these locations the cab roof was lowered and the chimney decapitated, seemingly with disastrous effects upon steam raising capacity.

The Hampshire Narrow Gauge Railway Society acquired WENDY from Dorothea in 1961 for the sum of £30 but, for a variety of reasons,restoration did not commence in earnest until 1969. Dismantling revealed that, if anything, she was in worse condition than her rusty, incomplete appearance suggested. It was evident that nothing short of a full rebuild would suffice, and this work would take several years.

In the event the task took ten years to accomplish. Much, indeed most, of the restoration work has been carried out at the HNGRS headquarters at Durley, near Southampton. Available skills included machining, welding, and even patternmaking, but certain tasks had to be contracted out. Fortunately, it proved possible to locate

BEFORE: WENDY lying outside the slate mill at the Dorothea Slate Quarry in September 1959, two years before she was taken away to Durley. (Vic Nutton)



AFTER: Twenty years later, fully restored and ready to work on the HNGRS track at Durley in November 1979. *(HNGRS/Peter Hammond)*

boilermaking, sheet metal working, and ironfounding concerns in the area that were capable of quality workmanship, which saved in transport costs, but the need to raise money to cover this work was one reason for the length of the project. Major replacements included the smokebox, firebox, chimney, saddle tank, motion parts, boiler fittings, smokebox door, boiler cladding, firebox arch support and cab roof. This list is far from exhaustive, and takes no account of many parts laboriously repaired to save the cost of replacement.

An early decision was made to restore the engine so far as possible to its 1919 condition which involved, amongst other things, discarding the home made spectacle plate, restoring the cab roof to its original height, and casting a new chimney to the original dimensions. Purists will note that WENDY now sports mechanical lubrication, and a back sheet to the cab, which were fitted for operational convenience and safety respectively.

In the latter part of 1979 WENDY moved under her own power for the first time in thirty three years. This was a great moment for those associated with the task, especially Barry Curl the project leader, and David Fooks, both of whom had been involved from the beginning. It demonstrates that an engine in a very derelict condition can be restored given time, dedication and, it must be said, money.

HNGRS drivers now have to accustom themselves to different techniques from those which answer best on the Society's Hunslet quarry engine CLOISTER. Firing the latter is chiefly a matter of keeping the back corners filled, with a thin fire over the front of the grate. By contrast, WENDY has to have a thick, bright fire at the front of the grate just behind the brick arch, otherwise she will go off the boil immediately. She does not seem to be fussy about fuel, but the right firing technique is vital. Once this has been mastered the boiler steams most freely. The engine rides steadily, decidedly better than CLOISTER, but drivers have to be sharper in their reactions. If a driver delays opening the regulator for a gradient, and speed is allowed to fall she seems to need more steam to recover than the Hunslet. Conversely, once over the gradient, WENDY must be "notched up" immediately, and the regulator eased because she is fast, and has rapid acceleration. There are three running notches, and it is possible to run much of the time with the reversing lever in the first notch from the centre.

Any member wishing to see WENDY in service should send a stamped addressed envelope to the HNGRS Secretary, Mr A Gilmore, 4 Holmdale Road, Gosport, Hants, for details. The Society's headquarters are not accessible to the public, but visits can often be arranged if advance notice is given.

STRIKING GOLD IN TURKEY

F. Jones & R.A. Bowen

Lucky for some!
(R.A. Bowen)

As the number of industrial steam locomotives becomes ever smaller, the discovery of a previously unknown narrow gauge line is something of an occasion. When the location is found to contain seven steam locomotives, then it really is something special. I have always tried to avoid following in the footsteps of others, but although pioneering is often frustrating and fruitless, sometimes one strikes gold. Ayancik was first discovered by poring over large scale maps in the Royal Geographical Society library. Several possible locations had been checked in 1977, but to no avail, and a railway network running inland from Ayancik could not be investigated due to car failure. However, in 1978 a determined effort was made to get there.

Situated on the north coast of Turkey between Samsun and Zonguldak, Ayancik is joined to both by a dubious coastal road. There is no through bus between the two, but I thought that it should be possible to accomplish the journey by Ford Transit "dolmus", with various changes. I travelled from Ankara to Sinop by the only bus, then on to Ayancik the next day by Transit. There were four or five making the trip each day, allowing plenty of time to return to Sinop on the same day.

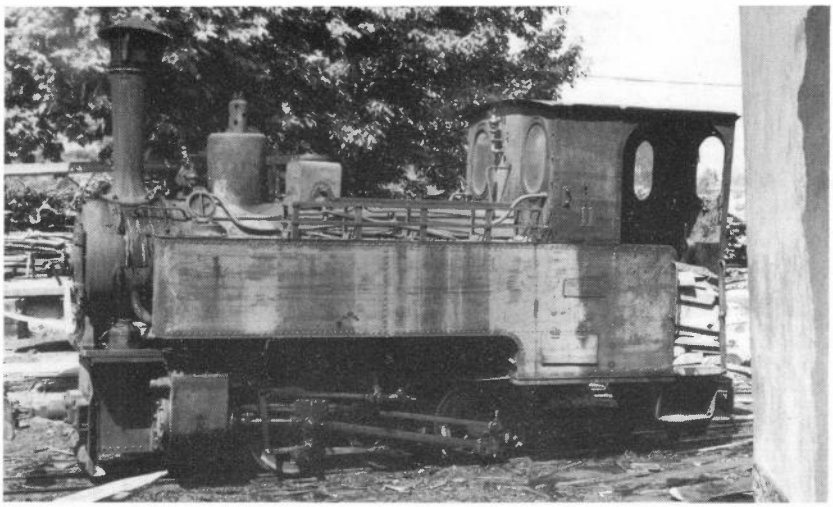
The Transit approached the town from inland, but there was no sign of track until we were almost in the town, and as that seen was half buried, I was most depressed at having apparently wasted three days of the holiday. I wandered down to the sea front and noticed a factory away to the east. Not having anything else to do I ambled over to it, and was tickled to see shiny track, and then, a little further on around a building, a steaming 60cm gauge 0-6-0 tank! Behind it was a shed which looked promising, and inside were two others, both long disused. I returned to the road and soon realised that I had entered the rear of the running shed. The staff were highly amused to see such interest being taken in their locomotives, of which there were another two standing dead in front of the shed, and the final two inside.

The factory is now operated by TC Orman Bakanhgi, Fabrikasi Sondopce. Although the network of lines serving the inland forests and the town was closed in the 1950's, a short seciton to the timber yard 2km from the factory survived, but is no longer used. Road transport now brings logs direct to the plant, and the railway is simply retained to carry waste timber to the boiler house which powers the factory and the town. A fire-fighting train is also kept is service, but only one of these locomotives is now required each day:

1	0-4-0T	Henschel	21142/1942		11	0-6-0T	O&K	12211/1930
3	0-4-0T	O&K	10519/1924	Out of use	12	0-6-0T	O&K	12212/1930
4	0-4-0T	O&K	10520/1924	Out of use	13	0-6-0T	O&K	12213/1930
-	0-4-0D	Deutz	24245	Dismantled	14	0-6-0T	O&K	12214/1930

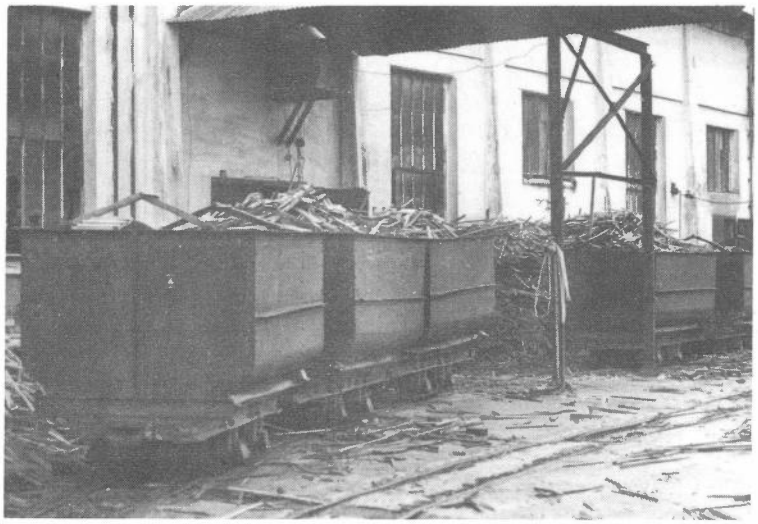
So far as I was able to understand from the staff, there never was a number 2. The coincidence in the numbering of 11 to 14 will be noted; these locomotives were supplied to Soforbel, Brussels, and carry "Orenstein & Koppel S.A. Bruxelles" plates.

Altogether then, this was a very satisfying trip some 160 miles from the nearest railhead. There seems to be accommodation in Ayancik, so anyone wishing to extend their visit should have no problem. Another woodyard with track exists to the north of the Zonguldak-Samson road between Bartin and Karabük, possibly near Ulus, and finally, does anyone know what happened to the locomotives supplied by H K Porter to the Turkish Forestry authorities after 1945?



11 outside the running shed at Ayancik.Note the rack for wood fuel on top of the side tanks. (F. Jones)

11 in the foreground, and 13 in steam in the background on 1st November 1978. (R.A. Bowen)



These wagons are fitted with unusual "clamshell" bodies which can be lifted from the frame, and opened to discharge the load into the boiler house. (R.A. Bowen)

TOMMY'S DAY AT ANACORTES

Ron Cox

The Anacortes Centennial Celebration over the weekend of August 4-5th, 1979, provided our member Tommy Thompson with an ideal opportunity to demonstrate his ability to establish a tourist railway in the area. He has campaigned for this for some years, but until this event was unable to operate any services. Anacortes is 65 miles north of Seattle, on the Pacific coast of Washington, USA, and the celebrations also included an Arts and Crafts Festival. Since Tommy's equipment is all home built, the railway was a craft exhibit in its own right.

The Anacortes Railway is 18in gauge, and was laid on the evening of Friday, August 3rd, by Tommy and a small band of helpers, from Anacortes Port Dock, down the centre of Commercial Avenue to 4th Street, a distance of 840 ft. The local telephone company transported the entire railway between Tommy's home and the site. About 30 track panels, prefabricated in new 20 lb/yd rail spiked to 3¾in × 6in × 41in cross ties, were first dropped into place; then station buildings, platforms, and telegraph were installed and working within five hours! On Saturday morning a bronze spike, engraved by a local jeweller, was driven home by the Washington State Senator before a gathering of local dignitaries.

The locomotive is a Forney 0-4-4 tank, with running gear made up from parts of a 1909 Porter compressed air locomotive from Homestake Gold Mine, of Lead, South Dakota. It weighs 4½ tons, the boiler pressure is 150 psi, cylinders 5in × 8in are adapted from the compressed air locomotive, with valves operated by inside

No 1 loaded on the telephone company trailer for transport to the Anacortes Railway, 3rd August. *(T.G. Thompson)*

The train runs into 4th Street station on 5th August. A similar operation is now planned for the weekend of 3rd/4th August 1980. *(T.G. Thompson)*

Stephenson link motion, and the driving wheels are 23in diameter. Vacuum brakes, steam carriage heating equipment and a carbide headlight are fitted. The single bogie passenger car seats three in the leading compartment, four in the centre compartment, and three in the open trailing compartment, ten passengers in all. The interior is clad in American Cherry wood, with raised panelling and mouldings, finished with three coats of china oil varnish. The car is sumptuously furnished with Pagoda silk ceiling, red carpeting, seats upholstered in Sultan Red velvet, buttoned and tufted; tassled lambrequins, gold dusted mirrors, brass flower holders and door sills. Exterior finish is British Racing Green with gold leaf lettering. Doors have solid brass hardware based on Talyllyn Railway stock, and the open compartment is enclosed by brass safety rails. The car took 1400 working hours to complete.

Over the weekend the locomotive ran 173 trips totalling 56½ miles, and hauled 2400 passengers. It performed remarkably well, always had a full head of steam, and the only problem was slight overheating of the rear bogie axle boxes. After replacing the cotton waste packing, and refilling with oil, no further problems were encountered. One question regularly put to the crew was "What fuel do you use?", the reply being, "Coal, naturally". Services finished operating at 7 pm on Sunday evening at the end of the Arts and Crafts Festival, and the entire railway was dismantled and removed to a barn at Tommy's home. By 9.15 pm the only traces of the railway were a few drops of oil on the road surface.

The operation proved to be the best public relations exercise ever for the proposed railway, and was so successful that the local authority plans to apply for an Urban Mass Transit Grant to construct a permanant railway, financed by a public corporation. The railway would then be leased to the Anacortes Railway Authority, Tommy Thompson and his helpers, who would undertake operation and maintenance. The planned line will be 3.3 miles long, and be steam worked with ten passenger cars including a parlor observation car, three parlor cars, an enclosed first class observation car, three open cars, a parlor/baggage car, and a dining car complete with three tables and a kitchen.

I am greatly indebted to Tommy Thompson for the information and photographs contained in this article, and feel sure that members will wish him well in his endeavours. My only regret is that Anacortes is slightly beyond the range of the average NGRS weekend visit.

LLYN COWLYD TRAMWAY

S.A. Leleux & M. Swift

In the first decade of this century there was a growing interest in the new metal aluminium, but its production required low cost power and hydro-electric power stations offered the best solution. The mountains of North Wales had many suitable sites, and some installations were already in operation. The North Wales Power & Traction Co Ltd was the major electricity producer, and had acquired some of the water rights in the Dolgarrog area. The Aluminium Corporation Ltd, registered on the 10th April 1907, needed a source of cheap power, and these two companies came together to realise their joint aims.

An aluminium smelter was constructed at Dolgarrog, incorporating a DC generating station supplied with water from Llyn Eigiau, a reservoir in the mountains some three miles south-west of the works, and more than 1200 ft above the Conway valley. The valley is steep-sided, and clothed in trees, but between the site of the smelter and Llyn Eigiau lay the route of the Cwm Eigiau tramway, a narrow gauge line from slate quarries to a wharf on the river. This had been closed, and largely abandoned by 1888. The course of the three inclines carrying this tramway from the edge of the escarpment to the valley floor was cleared, and a single standard gauge incline climbing 825ft in 700yds was laid on part of the site in 1907. Wagons were hauled to the summit by a steam winding engine, and worked over the 3½ miles to the reservoir site by two standard gauge locomotives, which had also been taken up the incline. Bott & Stennett were the contractors for this work, completed the first stage in 1908, and the second stage in 1911. The standard gauge line, including the temporary incline, was lifted about 1910.

Dolgarrog works and the old power station about 1912. In the foreground is the line from the wharf to the smelter, and in the background the pipeline descends through the trees to the power station. *(Central Electricity Generating Board)*

The foot of Dolgarrog incline, probably in the early 1920's, with a party about to set off on an outing to Llyn Cowlyd. The haulage cable is already attached to the leading wagon, whose occupants seem unmoved by the experience in prospect. *(collection J.M. Ryan)*

Alumina, the oxide from which the metal is obtained, was at first imported from Germany, and the aluminium produced, together with surplus carbon anodes, were exported back to Germany. A 2ft gauge railway was laid within the works, and in 1912 a short branch was laid to a wharf on the river. Most traffic was worked by hand, but wagons travelling to and from the wharf were hauled by cable. About 1913 a canal was cut directly into the works, and the branch to the wharf was closed and lifted. On the outbreak of war in 1914 trade with Germany ceased abruptly, but the increased demand for aluminium on the home market enabled the company to prosper. A small rolling mill was laid down during the war, and in 1916 a standard gauge siding about one mile long was constructed from the works to Dolgarrog station. This crossed the river on a girder bridge shared with a new access road.

The upper portion of the incline and passing loop from the meeting point of the pipeline and railway. May 1965.
(P. Hindley)

The Aluminium Corporation had purchased the winding gear and some of the incline materials in March 1911, but although the standard gauge track was removed it is uncertain whether the original 2ft gauge rails were lifted, or left in position beneath the standard gauge. In 1916 the incline was cleared, a 2ft gauge track laid on the present site, and during the following months extended for 3½ miles to Llyn Cowlyd, reached in May 1917. Llyn Cowlyd had been made into a reservoir about 1900, when the Conway & Colwyn Bay Water Board built a dam to raise the water level from 1155ft to 1169ft. It was a natural source of additional water for the power station, and about March 1919 a contract was awarded to Sir Robert McAlpine & Sons Ltd to construct a new dam, and a tunnel connecting Llyn Cowlyd with Llyn Eigiau, 1¼ miles away in the next valley.

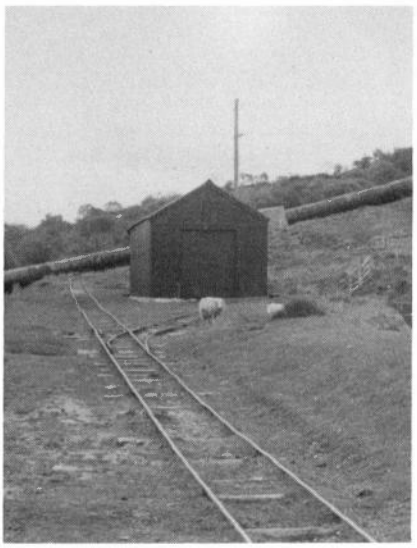
All materials and equipment required for the work had to be hauled up the incline, then taken forward to the dam site by the Orenstein & Koppel EIGIAU, or a Bagnall 0-4-0 saddle tank. McAlpine worked traffic on the incline during three days each week, and the tramway during the remaining three days. The new dam was located downstream of the original, and raised the water level to 1201ft. A 6ft diameter steel pipeline, reducing to 4ft diameter, was installed to carry water to the power station. The dam was completed in December 1921, and officially opened on 20th September 1922, though the tunnel to Llyn Eigiau was not completed until somewhat later.

A closer link with the North Wales Power & Traction Co Ltd was forged in 1918 when the Aluminium Corporation purchased a controlling interest. Four years later the company title was simplified to North Wales Power Co Ltd. Development was not confined to power supply. Additions were made to the reduction furnaces and rolling plant after the war, and about 100 houses built to accommodate the growing workforce. In 1924 a small reservoir, Llyn Coedty, was being built across the Afon Porth-llwyd about ¼ mile from the incline head.

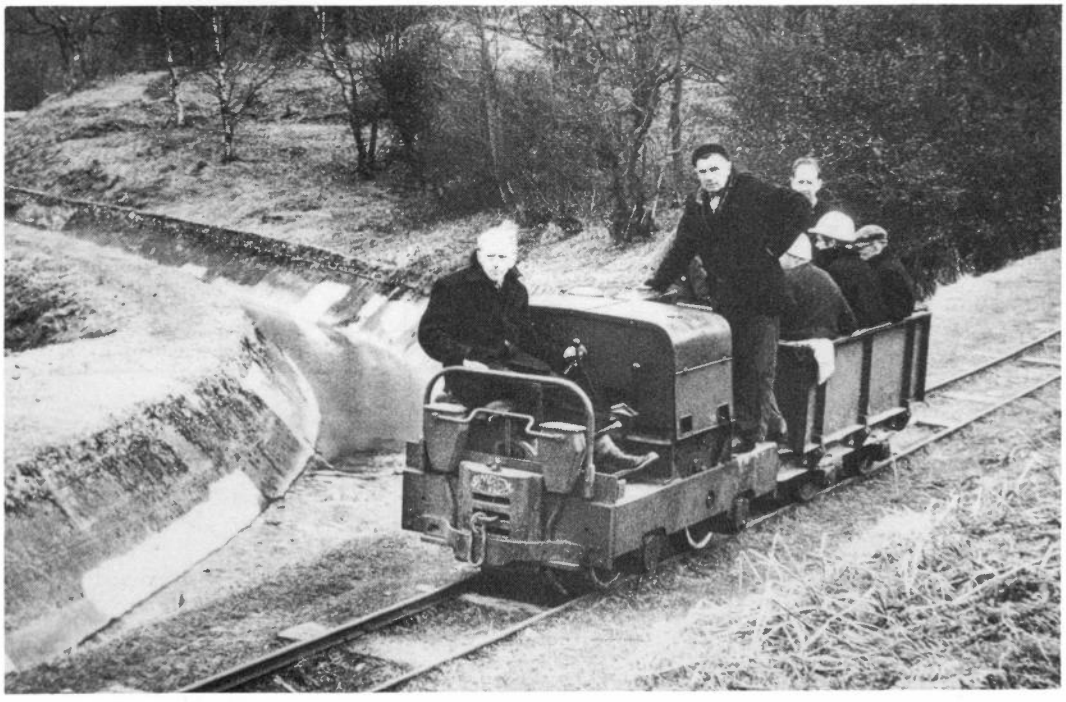
Then, on 2nd November, 1925 the dam at Llyn Eigiau failed. A torrent of water rushed down the valley, carried away much of the new reservoir dam, and spilled down the steep hillside to inundate the village below. Many houses were severely damaged, the works was partly buried by debris, and 16 people lost their lives in this disaster. The following year the Corporation became associated with the International Aluminium Company Ltd, and began to obtain ingots for rolling from the Norwegian branch of this company. A new power station with AC generators had been commissioned in 1924, but the importation of ingots reduced the power required in the factory. On the 1st July, 1929 the catchment areas, reservoirs and pipelines, power station, and Llyn Cowlyd tramway were sold by the Corporation to the North Wales Power Co Ltd.

This change of ownership probably had little effect on tramway operation. The only means of access was up the incline, either on foot or in a wagon, and when a train was loaded with whatever men and materials were required the Muir Hill locomotive would set out for Llyn Cowlyd. There were occasional periods of intense

The winding house and store, now demolished, at the incline head in May 1965. *(P. Hindley)*



The locomotive shed near the incline head. May 1965. *(P. Hindley)*



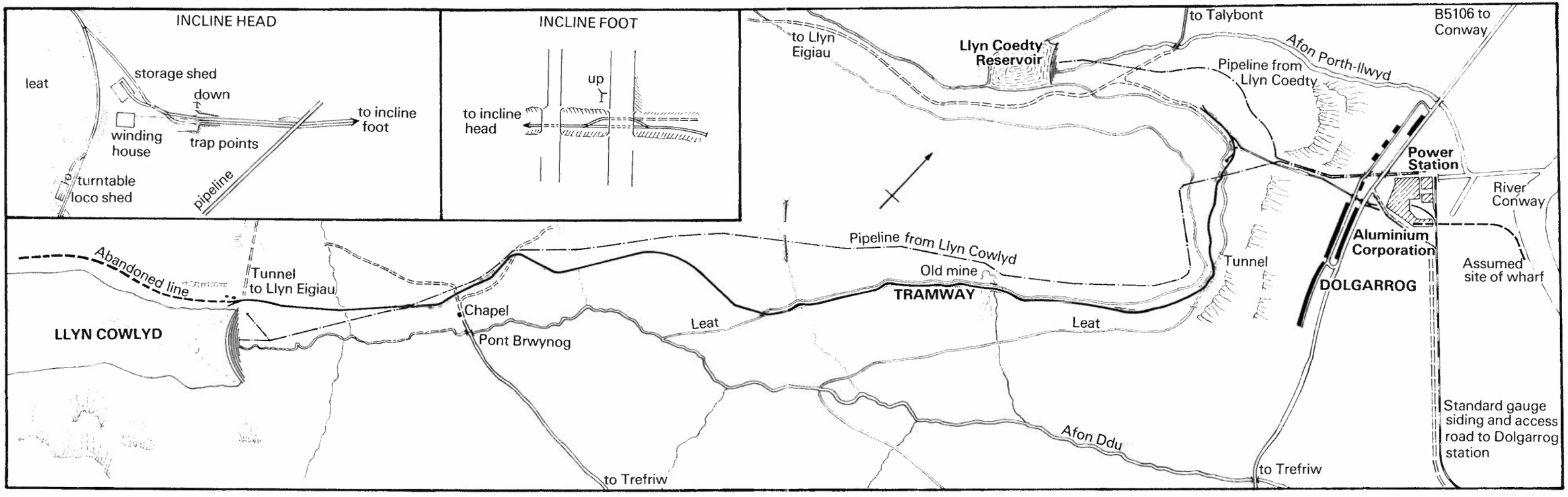
Workmen's train approaching the incline head from Llyn Cowlyd in April 1968, shortly before the tramway was closed. *(A.J. Wilson)*

activity, especially during 1936/38 when J L Eve Construction Co Ltd carried out major work on the pipeline, and brought additional locomotives and rolling stock to handle the extra traffic.

In common with other electricity producers, the assets of the North Wales Power Co Ltd were vested in the British Electricity Authority, now the Central Electricity Generating Board, on 1st April, 1948. Despite the subsequent development of major coal-fired power stations elsewhere, existing plant was not neglected. In 1955 John Laing & Sons Ltd received a contract to construct a watercourse more than five miles northwards from Llyn Coedty, which doubled the catchment area. The spillway was also raised to increase the storage capacity of the reservoir. John Laing used four 2ft gauge Ruston & Hornsby diesel locomotives on this contract, but it is unlikely that these worked on the Llyn Cowlyd tramway. One side effect of this work was improved road access into the valley of the Afon Porth-llwyd, and construction of a rough road to the incline head in 1958. After this date the incline was no longer used regularly, if at all.

A new Simplex diesel locomotive arrived in 1962, and steel wagons were also obtained at about the same time. This was the first new equipment since the line was built, and greatly improved its operation. Track maintenance in such a remote area was always a problem, and during the next few years sleepers began to deteriorate at a faster rate than they could be replaced. There was also a growing interest in industrial railways, and the Railway Enthusiasts Club, of Farnborough, specialised in visits to unusual systems. They planned to run a special train to Llyn Cowlyd early in 1968, but this was postponed until the summer. Unfortunately, at some time between April and August of that year a train carrying workmen was derailed, the tramway was declared to be unsafe, and closed temporarily. There was now road access from Trefriw to within a short distance of Llyn Cowlyd, and a rough track was cut from this road to the reservoir. Men could now drive a Land Rover direct to the dam.

The route of the tramway is shown on the accompanying map. The incline starts beside the aluminium works, passes beneath a concrete bridge carrying the B5106 road, and immediately starts to climb steeply as a single track. There is a second overbridge carrying a minor road, then trees close in on either side. After some 300 yards the track meets the two pipelines to the power station, and the gradient increases to about 1 in 1½ to surmount the steepest part of the hillside. In the middle of this section is a loop, and above it the incline continues as three rails, the centre rail being common to up and down lines. The route passes beneath the pipeline, and the gradient eases as it leaves the wood. A final climb lifts the track onto the incline head, 825ft above the valley floor.



The track divides to form a loop fitted with trap points, and curves round below the corrugated iron shed housing the electric motor and cable drum. A siding branched off into another shed once used for storing wagons and materials, but now removed. The track makes a trailing connection with the line to Llyn Cowlyd, then runs along a rough road beside the watercourse to terminate in two sidings.

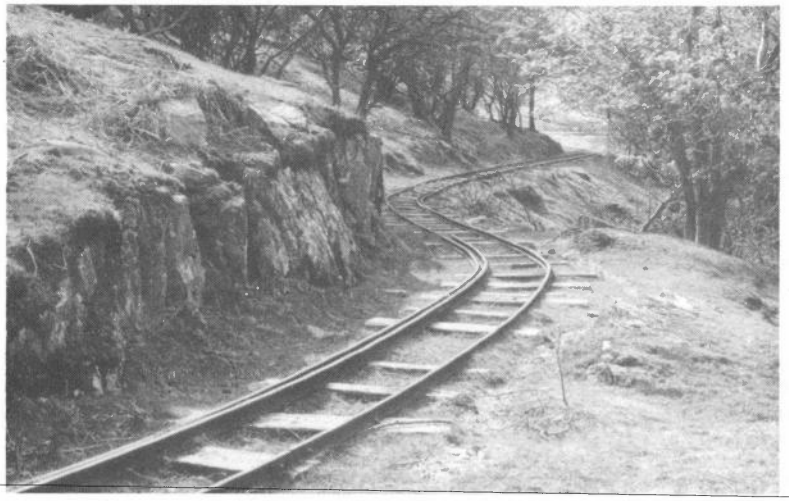
The line to Llyn Cowlyd passes through a rock cutting behind the winding house, and throws off a siding to the corrugated iron locomotive shed. Immediately outside the shed is a small steel turntable capable of accommodating an internal combustion locomotive. The track crosses the watercourse, passes beneath the pipeline, and winds across an open meadow to the edge of the escarpment. Here the line passes along a rocky ledge, then climbs steeply out of the woods to where fantastic views of the Conway valley open out, before curving away to the south-west and entering the valley of the Afon Ddu, a broad bowl of rough pasture and moorland.

At this point the pipeline is out of sight above the line, but an old leat which may have carried water to power waterwheels at the old mine is close by, and the track climbs steadily to reach it. Waste tips from the mine scar the hillside, and the tramway spans the mine access track on a simple bridge formed of two timber baulks. For the next ¼ mile the track is laid on the bank of the leat, then crosses it and strikes across a boggy moor towards the pipeline. On reaching it the lines turns to run alongside, crosses an old Roman road and follows a ledge above the chapel at Pont Brwynog, built in 1890 to serve the isolated farms in the valley. The rails cross another farm track, pass under the pipeline for the last time, and follow an almost straight course over rock-strewn moor to the north end of the curved dam wall at Llyn Cowlyd, 3½ miles from the incline head. The track layout here is simply two sidings beside a couple of stone huts, which once accommodated men and materials brought up on the tramway. The line once continued alongside the reservoir for some distance, but has long been lifted.

The lower portion of the incline is laid in heavy flat-bottom rail, but the upper portion, and the remainder of the line to Llyn Cowlyd is in a lighter section, about 20lb/yd, spiked directly to timber sleepers. The track is unfenced throughout its route, but gates are provided at field boundaries. Most of the culverts are substantially built from stone obtained adjacent to the track.

The first locomotive to work this remote tramway was the well-known Orenstein & Koppel 0-4-0 well tank, EIGIAU. It was a standard 30 hp machine for 600 mm gauge track, carried works number 5668, and was ordered by Chas L Warren, England in 1913. Warren had previously supplied a 20 hp locomotive to Lever Bros at Port Sunlight, but his customer for 5668 is unknown. In *Reservoir Railways of Manchester and the Peak,* (Oakwood Press 1977) Harold D Bowtell suggested that it may have worked on pipeline construction in Derbyshire, but his subsequent research disproves this theory. The locomotive probably arrived at Dolgarrog in 1916 for constructing the tramway, and gained the name EIGIAU on the cabside. Although owned by the Aluminium Corporation, it was used by Sir Robert McAlpine & Sons Ltd in connection with their contract to construct Llyn Cowlyd. McAlpine also had a Bagnall 0-4-0 saddle tank (2080/1918) on this job, which was taken away to Dinas Jc on completion of the works, to help build the Welsh Highland Railway, also contracted to McAlpine. EIGIAU remained, but the arrival of the first internal combustion locomotive in 1922 reduced the need for its services, and it may have been returned to the works for storage. It was sold to Lord Penrhyn's Slate Quarries in 1929, and entered a new period of activity on the levels above Bethesda, which continued until it was laid aside during the early 1950's. That might have been the end for EIGIAU, but in 1963 it was purchased by G J Mullis, and moved to Coley Pits Farm, near Droitwich for preservation. Restoration work occupied eighteen months, and the result was superb. EIGIAU appeared in green livery, lined out in red, with new brass nameplates, and was steamed from time to time on a track at the farm. In 1971 it was purchased by Alan Bloom, and is now in regular service at Bressingham, Norfolk.

About ¼ mile beyond the incline head the track winds across this meadow, following the contours in true narrow gauge style.
(A.J. Booth)



In the woods on the edge of the escarpment the tramway has more sharp curves.
(A.J. Booth)

This simple bridge carries the rails over the path to the mine.
(A.J. Booth)

EIGIAU on the scrap line at Penrhyn Quarries in June 1956 *(B. Hilton)*

A Muir Hill tractor was supplied by E Boydell & Co Ltd, Trafford Park, Manchester in 1922 to replace EIGIAU. It consisted of a standard Fordson tractor engine, gearbox, and rear axle assembly mounted on a 2ft gauge, four wheel underframe with slotted buffer beams at either end. The 20 hp engine was normally started on petrol, then run on paraffin when it reached the operating temperature.

An external chain drive connected the tractor rear axle to the leading axle on the frame, giving three forward speeds, but only one of 2½ mph in reverse. This drawback was countered by providing a small turntable outside the shed, and presumably another at Llyn Cowlyd. In April 1924 this machine was loaned to the Festiniog Railway for trials, but proved unsuitable, and after four months it was returned to Dolgarrog, where it continued in service for at least the next twelve years. When a more modern locomotive was obtained it was disposed of about 1938/39, and it is suggested that it went to either Rhiwbach Quarries, or Maenofferen Slate Quarry Co, to become the GWR yard shunter at Blaenau Ffestiniog. If so, it survived until 1966, and is illustrated in *The Narrow Gauge No 72.*

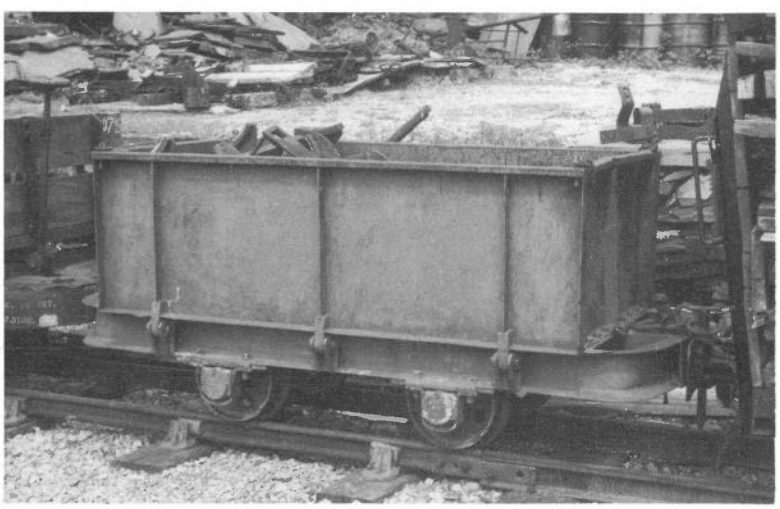
Because only one locomotive was available to operate the tramway, it was usual for any contractors carrying out maintenance or reconstruction to provide their own motive power. J L Eve Construction Co Ltd, of London, received a contract for pipeline work in 1936, and used four locomotives during the next two years. The first to arrive was a "Planet" 4w petrol, delivered new from F C Hibberd & Co Ltd, London (works number 1988/1936) in June, 1936. Very similar to the "Simplex" design in appearance, it probably had a 20 hp engine and weighed 2½ tons. At the end of the contract it was purchased by the North Wales Power Co to replace the Muir Hill, and continued in service until 1962, when it was replaced in turn by a modern Motor Rail diesel. In 1967 it was taken away for scrap to Oldham Bros of Liverpool. Two of the remaining locomotives were Motor Rail "Simplex" 2½ ton machines with 20 hp petrol engines. Works number 3831/1926 was rebuilt by the builder from 985/1918, one of many delivered to France for War Department Light Railway operation, and worked on contracts in Scotland for several years before being returned to Motor Rail Ltd in 1935. It was despatched from Bedford to Dolgarrog, for use by J L Eve, in July 1936. Works number 5061/1930 was supplied to Hall & Co, Romford, and was later with Greenham Plant Ltd on contract work in the London area during 1934. Spares for this machine were consigned to J L Eve Construction Co Ltd at Dolgarrog during the period of this contract, so it is reasonable to assume that it worked here, either under Eve's ownership, or on hire from Greenham Plant. The fourth locomotive has not been identified, but was most likely a small petrol-driven machine similar to the others. These three were taken away on completion of the contract in 1938.

Wm Latimer & Co Ltd, of Stockport, had a contract for painting the pipeline from Llyn Cowlyd in 1965, and hired a Ruston & Hornsby 20 hp 4w diesel from Pengwern & Gwydyr Quarries Ltd, Llanrwst, in April. This worked for about two months taking men and materials to their workplace along the pipe, and was then returned to Llanrwst. Another contractor was employed in 1967, and hired an identical Ruston (works number 235652/1945) from Fred Watkins Ltd, Coleford. It arrived at Dolgarrog about April, but had returned to Coleford by June, its work on the tramway completed.

Finally, in 1961, the CEGB ordered a new locomotive from Motor Rail Ltd to replace the ageing Planet. This was a 2½ ton machine with a 28/30 hp 2LB diesel engine, works number 22154/1962, and was despatched from Bedford in January. Compared to the many years of service which its predecessors put in, this was still almost new when closure of the tramway forced its retirement.

It is surprising that such a long line appears to have had only limited rolling stock. In the days of the 2ft gauge line from the works to the wharf simple flat wagons sufficed for bagged materials or ingots, and side tip wagons for bulk loads. The earliest known wagons on the tramway were substantial wooden open wagons, carried on square oak frame members between the wheels. These members extended to form dumb buffers, and were about 7ft long overall. The body was about 4ft 10in long, 3ft 4in wide and 2ft 6in high, formed of thick planks

One of the wooden box wagons stored at Llanberis in May 1979. (A.J. Booth)



One of the Allens of Tipton open wagons on the Llanberis Lake Railway, May 1979. (A.J. Booth)

The end of the tramway at Llyn Cowlyd in May, 1979.
(A.J. Booth)

strengthened by corner plates and iron tees at each end. Three sides were fixed, and the fourth was removable for unloading. The axle boxes were unsprung, and the wheels, 14in diameter with five curved spokes, made by Miller of Edinburgh. A coupling bar extended through the frame to hooks at each end. There were four or five wagons of this type, most of which survived to the end. To carry pipes, or heavy loads, two pairs of bogies were used. One pair had very heavy timber side frame outside the wheels, and was used for machinery, the second pair had frames similar to the open wagons. The remains of a bogie carrying the name Popineau Plaine, St Denis (France) on the axleboxes lay near the incline head in 1965, and may have come from another type of wagon.

In the last years of operation four steel open wagons were purchased from W G Allen Ltd, Tipton, probably in 1961/62. These have a channel section frame, curved at each end and fitted with buffing plates. The body is 6ft long, 3ft 1in wide and 2ft high with drop sides, and the 12in diameter wheels are carried in roller bearing axle-boxes. When new they were painted green.

The closure of the line in 1968 was intended to be temporary, and no attempt was made to dispose of the equipment. The Simplex was stored, and the rolling stock lay around at the incline head for several years. Some short sections of track were either lifted, or dragged off the formation to allow road vehicle access, whilst odd rails were removed in other places. And so it might have remained had it not been for new hydro-electric power developments in North Wales. The construction of the Dinorwic Pumped Storage Scheme at Llanberis, and the refusal of the planning authorities to permit overhead lines in an area of great natural beauty left but one alternative. The cables would have to be run below ground along the only available route, beside the Llanberis Lake Railway which had opened in 1971. To handle traffic during the construction period additional motive power was required, so the Simplex was purchased from the CEGB, and taken to Llanberis in September 1975. The three surviving wooden wagons, and four modern steel wagons were also removed at the same time, but only the latter saw service during the contract. The Simplex passed through Llanberis works, and emerged carrying a cab rescued from one of the Dinorwic quarry "Planet" machines, electric lighting, and plates No 9 DOLGARROG in recognition of its origins.

So now, eleven years after the Llyn Cowlyd Tramway ceased operations, many of its assets survive elsewhere. At Dolgarrog the impressive sweep of the incline still cuts through the woods on the valley side, and is seen at its best in winter when the trees are bare of leaves. Above the tree-line the spindly rails cut through rough grass on their way to Llyn Cowlyd, following the contours of the ground in the best narrow gauge tradition.

The authors have received considerable assistance during the preparation of this article. Much of the background history derived from the CEGB, North West Region; British Aluminium Co Ltd; *The Engineer,* 20th Nov. 1959; the NGRS Library; and *Industrial Locomotives of North Wales.* Most of the research at Dolgarrog was carried out by E R Scott, and additional detail was kindly provided by James I C Boyd (history), V J Bradley, Llanberis Lake Railway, (history), M P Burgoyne, Motor Rail Ltd, (locomotives), P Hindley (map), A Neale and M Murray (EIGIAU); J A Peden (contracts), T J Lodge, F L Pugh and A J Wilson. The article by G J Mullis in *Industrial Railway Record* No 14, June 1967 describes the restoration of EIGIAU.

AT WAR IN EAST AFRICA

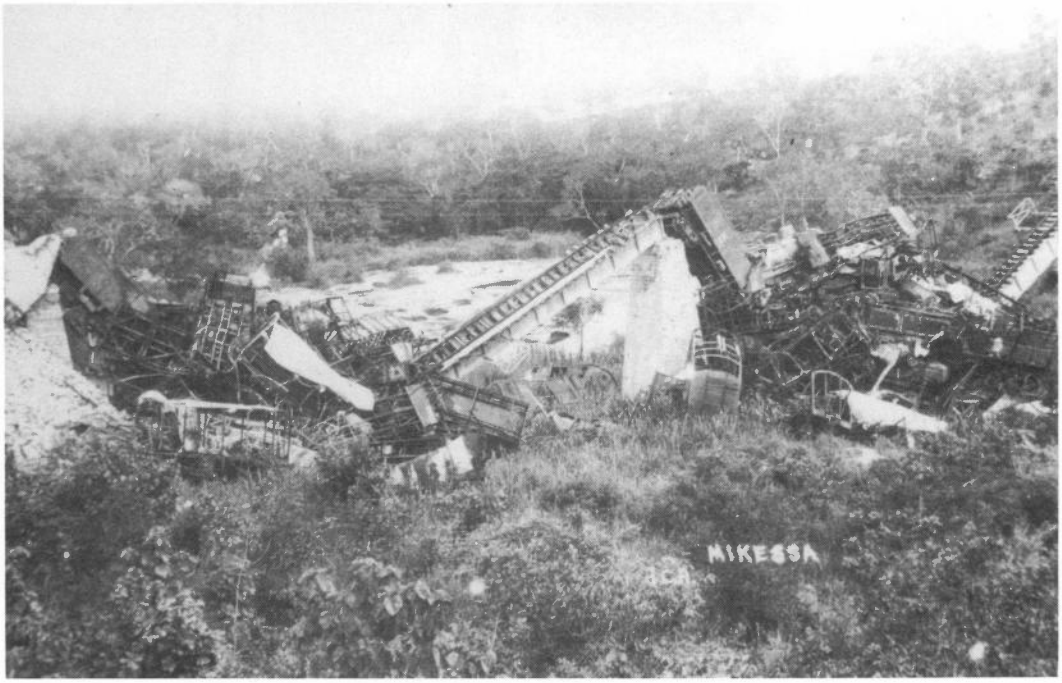
M. Swift

When war broke out in 1914 the German colonies in Africa were inevitably involved in the conflict, together with the British colonies and their allies. In German East Africa, the present-day country of Tanzania, two metre gauge railways were already well established. The Ostafrikanische Nordbahn, laid from the port of Tanga to Moshi between 1893 and 1912; and the Ostafrikanische Centralbahn and Mittellandbahn, which was commenced at Dar es Salaam in 1905. The tracks were laid through virgin territory with the object of reaching the valuable mineral workings in the Belgian Congo, which at that time had no rail outlet to the sea. Kigoma, on Lake Tanganyika 788 miles from Dar, was reached in 1914, only a few months before the start of hostilities.

The British forces in neighbouring Kenya expected to overrun their adversaries rapidly, but their first attack was repulsed. So, in 1915, a second expedition was mounted, and to improve the supply route a branch line was constructed from the Uganda Railway at Voi, southwards towards the German garrison town of Moshi. This expedition was successful, and the Northern Railway was occupied, repaired between May and August 1916, and connected with the Uganda Railway by completion of the line from Voi to Kahe. Locomotives and rolling stock could then be brought in from Uganda, but this did lead to complications because these were fitted with air brakes, incompatible with the vacuum brakes on the German equipment.

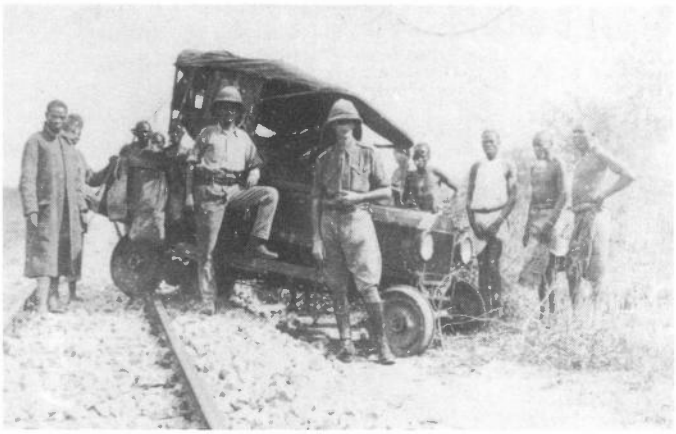
The campaign pressed on to the south, and as the German forces retreated it became clear that the Central Railway would soon be lost. To deny the facilities to the advancing force an almost unprecedented programme of destruction was carried out. Much of the track was destroyed, and virtually every culvert and bridge was blown up, often with locomotives and rolling stock in position. The most spectacular wreck was at Mikesse, about 110 miles from Dar es Salaam, where one of the bridge spans was demolished. Five trains were run into the gap until it was full, and the remainder of the spans were then blown up. The pile of wooden wagons was then ignited, to leave a tangle of twisted metal surmounted by two 46 ton 2-8-0s to face the Royal Engineers, who had the unenviable task of repairing the damage.

"Dodoma Workshops—Construction of the Central Railway in German East Africa." A postcard published in Dar es Salaam before 1914. Dodoma is 290 miles from Dar, and an important division point. *(collection G Richardson)*



The spectacular wreck at Mikesse bridge. *(collection G Richardson)*

Hanomag 2-8-0 No 108 was run onto this demolished bridge at Mikesse. A diversion crosses the temporary bridge behind the loco. *(collection G Richardson)*



This converted Ford car left the track at Kitaraka, presumably on the Central Railway, but with the aid of the onlookers will probably soon be back on its way. (collection G Richardson)

Temporary trestle bridges were erected in many places, and in others the track was diverted around the obstructions. Nevertheless, it was some time before the line could be used over its full length, and normal operations were only possible after locomotives and stock had been imported from India. A number of Napier 30 cwt lorries fitted with flanged wheels were used at first, and could haul a few small trucks loaded with supplies. Military patrols used Ford cars similarly converted, and these were capable of attaining considerable speeds on the well-ballasted track.

Count von Lettow Vorbeck, the German Commander, having abandoned the country served by the Central Railway, first established a new front some miles to the south, then embarked upon a guerilla campaign using his few remaining troops. At that time there were no railways in the south of the country, and the rivers were not navigable for any great distance from the coast. In 1917, therefore, two 60cm gauge railways were constructed to carry troops and supplies inland. The first of these was laid from Kilwa, on the coast. By early 1918 the rails extended 77 miles inland, and were being advanced at a rate of three miles each week. The second was developed from a plantation railway starting at Lindi, ten miles up a creek close to the border of Portuguese East Africa (Mozambique), and running inland for thirteen miles. The extremity of this line was at first occupied by the German force, but as they withdrew the Royal Army Service Corps took over full operation, and the line was extended to twenty miles by early 1918, and finally stretched for 85 miles.

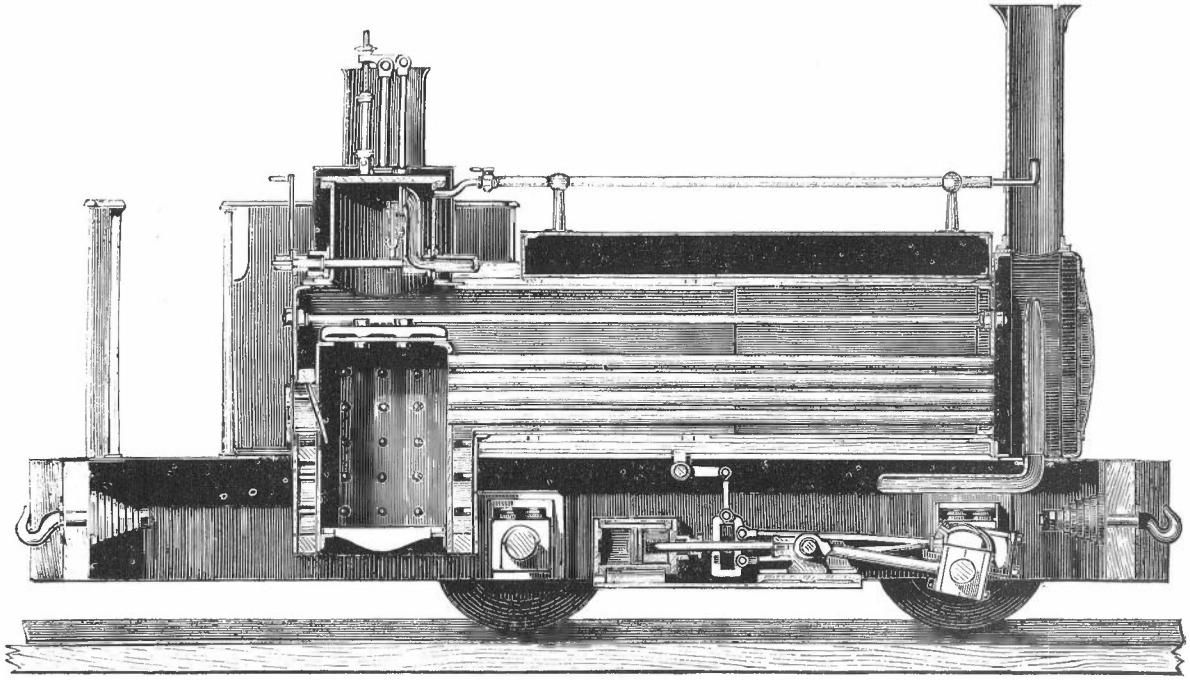
Several Simplex petrol locomotives were imported to work the new lines, but the most useful machines were Ford one-ton lorries converted to work on the 60cm gauge. Two types were produced, one with an open body for carrying stores, and one with three or four cross-bench seats for passengers. The engine and bonnet was carried on a four-wheel bogie, and the body on a pair of spoked or disc wheels driven by chains and sprockets. Some had canvas awnings fitted to protect the crew from the sun and tropical rainstorms. It is not known how many of these light tractors were delivered for service in East Africa, but a large number would be needed for such lengthy lines, particularly because reliability was often low.

Some of the rolling stock was constructed on wheels or bogies recovered from plantation railway equipment. Troops were carried in long-wheelbase four-wheel wagons, and stores on flat or open wagons. One tractor would normally haul one vehicle, and travel in a convoy of two or three, accompanied by a mechanic to attend to any breakdowns which could otherwise halt traffic. Despite their primitive construction and equipment these light railways were capable of delivering considerable quantities of stores a day to the railhead, and enabled sick and wounded troops to be quickly returned to base. In an area where malaria was endemic this rapid transport was particularly valuable.

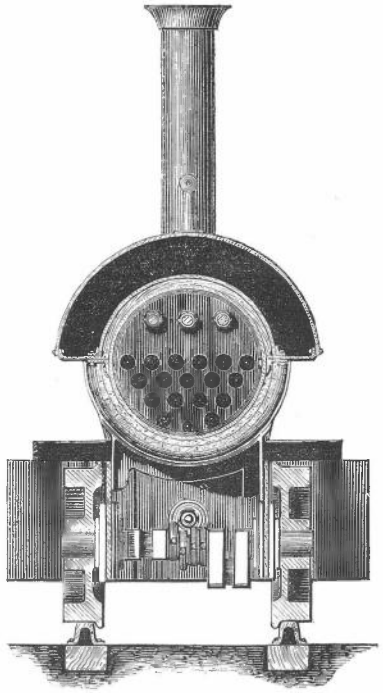
By the early months of 1918 the German forces had withdrawn further south into Mozambique, and the need for these established supply lines was much reduced. As a result, operations were run down, and probably ceased by April of that year. Most of the 60cm gauge track was lifted, and this brief episode in the annals of the Great War passed into history. After the war Great Britain received a mandate from the League of Nations to administer German East Africa, which was renamed Tanganyika. The Central Line of the Tanganyika Railway was completely rebuilt, and in many places improved to ease gradients and curves. Although some of the locomotives brought in from India during the war did return, others remained in Africa for the whole of their working lives. I would like to record my appreciation to G Richardson, who loaned the illustrations for this article, and to WJK Davies for assistance with preparing the text.

Ford lorry 2, which also carries K 1664 below the running number, with a passenger trailer on one of the 60cm gauge lines. A similar picture shows Ford 4, lettered "Sergeants Only", with an open trailer. *(collection G Richardson)*

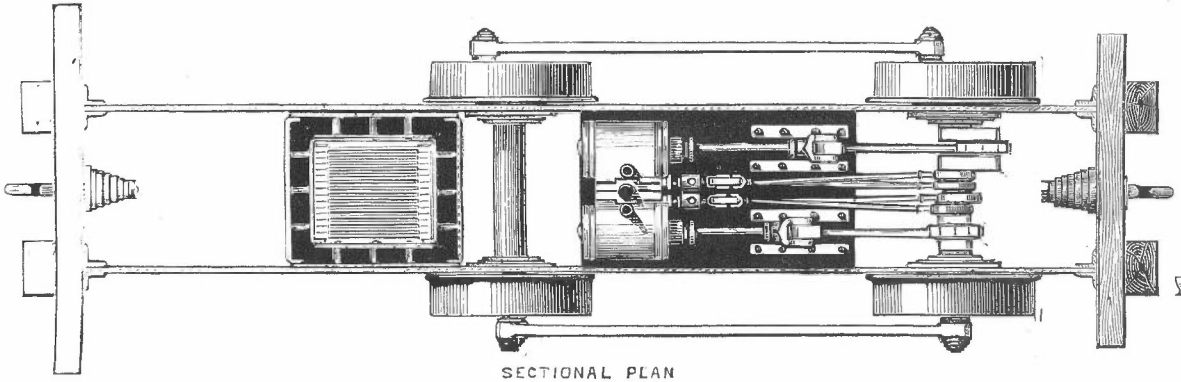
Ford 5 at Kilwa or Lindi. This differs in several details from the tractor above, and has a black radiator shell with a separate core, introduced in 1916, rather than the earlier brass radiator.
(collection G. Richardson)



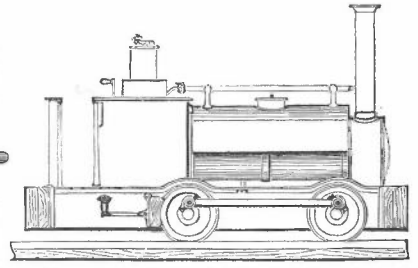
LONGITUDINAL SECTIONAL ELEVATION



TRANSVERSE SECTION

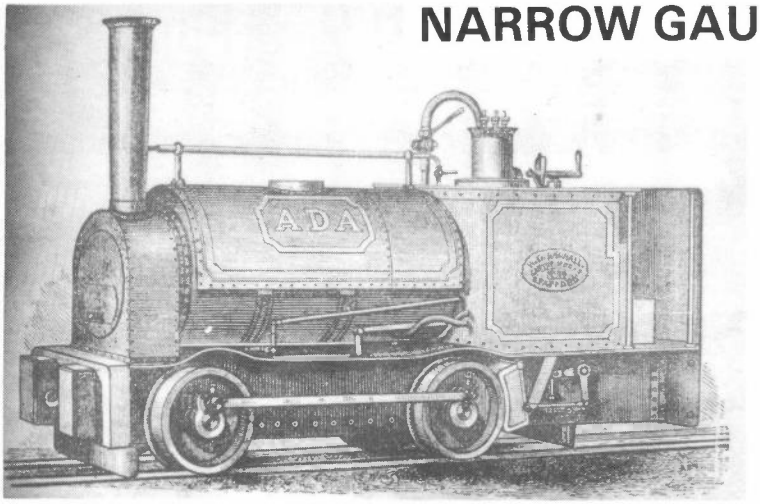


SECTIONAL PLAN



EXTERNAL VIEW

NARROW GAUGE TANK ENGINE



(Reproduced from The Engineer, 3rd January 1879 by kind permission of the Editor)

(collection A C Baker/TDA Civil)

"This is a working locomotive divested of all details not absolutely necessary, and designed especially for use on light railways, tramways and contractors work. It is as simple as an engine can be, and a perfect example of a small locomotive which has done good work and might be put in almost any hands."

"One engine has already been at work very successfully for about 18 months on a narrow gauge colliery and ironworks railway in South Wales, running on rails 14 lb to the yard and using a pressure of 120 lb to the square inch. Tested with a dynamometer, the engine showed a tractive power of about 400 lb with 100 lb steam pressure".

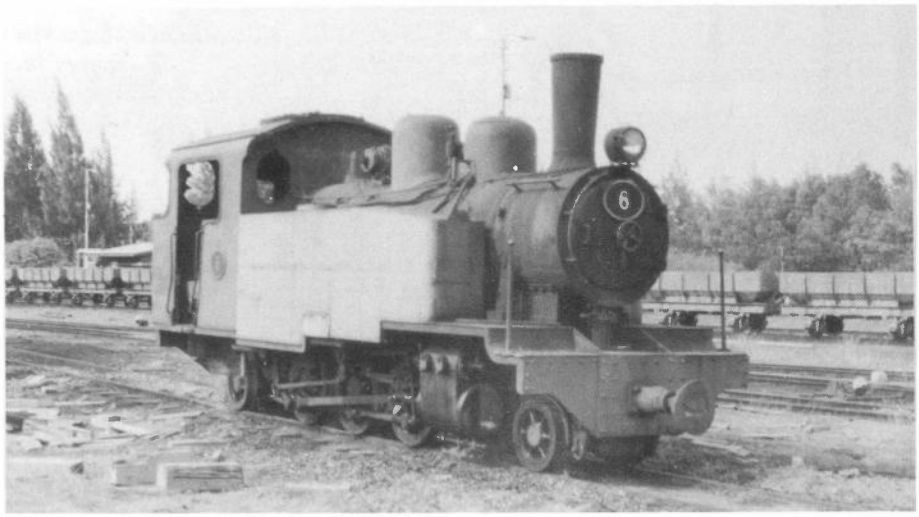
"Although the engine is but 22in gauge, all the working parts are between the side plates, and are fixed upon a plate attached simply by a pair of angle irons. This makes a rigid connection of the whole frame, and as the plate in which the parts are fixed is only fastened by turned bolts, and not rivetted, the whole of the working parts are easily disconnected and taken away for repairs, and replaced without the chance of error. The cylinders are, by the connecting rods, connected to the crank shaft, which is the leading axle, and being the weaker of the two, is made to carry the lesser weight. The axle-boxes and draw-bar are fitted with volute springs. This miniature engine is but 6ft 2in to the top of the funnel. It runs from 10 to 14 miles an hour, and its water tank and bunker carry a supply for 20 miles run. The line on which the engine works has a curve of ½ chain radius, and an incline of 1 in 40. Two similar engines work on the Wotton and Aylesbury line, but these are of 4ft 8½in gauge."

"The following are the particulars:

Cylinders	4in × 6in	Boiler	1ft 6in dia. by 5ft long
Cylinder centres	9½in	Tubes	17 × 1¾in
Wheel diameter	1ft 6in	Heating surface—firebox	11ft²
Width of tire	5in	—tubes	41ft²
Wheelbase	4ft 3in	Grate area	1¼ft²
Distance between frame	1ft 5¾in	Tank capacity	50 galls
Front buffer to leading axle	2ft	Coal box capacity	140 lb.
Rear buffer to trailing axle	4ft 6in	Weight in working order	56 cwt
Buffer height	1ft	Weight on leading axle	24 cwt
Overall length	10ft 6in	Weight on trailing axle	32 cwt
Buffer beams	front 3ft lg. rear 3ft 6in	Boiler feeds—one injector, one hand pump.	

Allan C Baker adds that ADA was the second locomotive built by W G Bagnall (works number 94), and his first for narrow gauge track. It was ordered in April 1877 by W Rees, had a copper firebox and brass tubes, and cost £250. ADA is thought to have worked at Maerserddafen Colliery, near Llanelly, which closed in 1887. A total of five Bagnall locomotives were built with cylinders between the frames, driving onto the leading axle, and ADA was the first of these. Although the article refers to two similar locomotives on the Wotton Tramway, only the second of these is believed to have had this arrangement.

SOLVING AN ORIENTAL PUZZLE



Arthur G Wells, of Maidstone in Kent, sent this photograph to Mike Swift for identification. It is from a set of ten taken by a friend, Jim Bush, who lived in Kuala Lumpur from 1949, but travelled extensively throughout South-East Asia. Though not a railway enthusiast himself, Jim sometimes sent negatives or slides to Arthur, but because these were of main line railways, identification was simple. However, this set of pictures, by far the most interesting, presented a puzzle which could not be solved immediately, and in recent years Arthur had lost touch with the photographer.

Mike was unable to identify the locomotive, but thought that it was of Japanese origin. The expert on obscure railways in the Far East is Charles S Small, of Greenwich, Connecticut, USA, and he not only identified the location, but also reminded Mike that the railway is described in his book *Rails to the Setting Sun* (Kegei Publishing Co Ltd, Tokyo, Japan, 1971), now unfortunately out of print.

The locomotive is number 6 of Eastern Mining & Metals Co Ltd, Kuala Dungun, Malaysia, and was photographed in the yards here, probably in 1967/68. A 2ft 6in gauge line runs from a loading jetty at Kuala Dungun, on the east coast, to iron mines eighteen miles away in the mountains at Bukit Besi. It was opened in 1930 by Nippon Kogyo Kaisha (Nippon Mining Company), and owned the following steam locomotives:

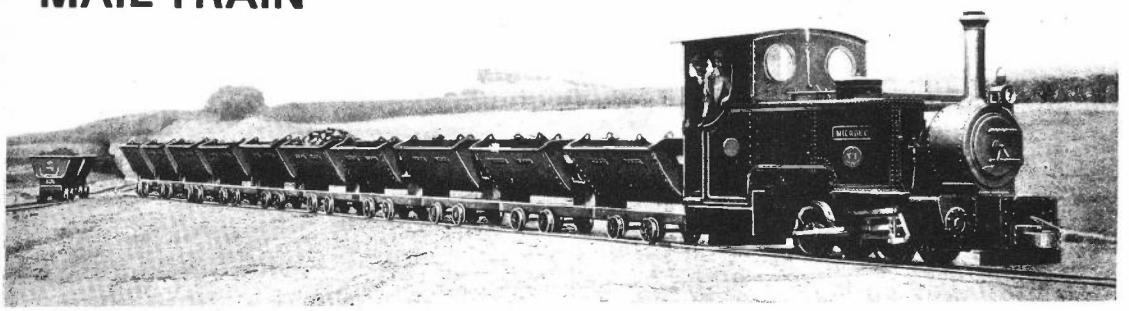
1 - 12	0-4-0T	13t	Hitachi	374-385	12/1919-2/1930
13, 14	0-4-0T	13t	Hitachi	438, 439	5/1931
15-17	0-4-0T	13t	Hitachi	492-494	5/1933
1 - 12	2-6-2T	26t	Hitachi	598-609	5-8/1935
13, 14	2-6-2T	26t	Hitachi	874,875	1-8/1937
15,16	2-6-2T	26t	Hitachi	888,889	7/1937
17-20	2-6-2T	26t	Hitachi	1011-1014	8/1939

In 1945 the mine and railway passed to the Enemy Property Custodian, and in 1949 was purchased by Eastern Mining & Metals Co Ltd. The locomotives were in poor condition. Some were scrapped, and other cannibalised, so that by 1960 all the 0-4-0 tanks had gone. The 2-6-2 tanks remained in service much longer, and in June 1967 numbers 5, 6, 7 and 15 were at work. By that time the line to the mines was operated by six Hitachi 0-6-0 diesels, numbered 1-6. A series of small Orenstein & Koppel 0-4-0 diesels numbered B1 upwards, and C1 upwards carried out shunting duties at the mine and jetty. All these were probably delivered in the late 1950's and early 1960's, but no precise details are available.

Ore was still shipped to Japan even after Eastern Mining took over, but now that large opencast mines have opened in Western Australia the Malaysian mine, unable to compete, is believed to have closed down in 1970.

We would like to thank Charles S Small for the solution to this particular oriental puzzle, and the editor has moved *Rails to the Setting Sun* to a more prominent position on his bookshelf, in case it is needed again!

MAIL TRAIN



HEDJAZ HOLIDAY

I found this article in No 85 very interesting, but would offer some minor corrections. Whilst photography in Syria is no problem, anyone so attempting around Amman station is likely to find themselves in trouble with the military. Even our party, with prior permission, needed clearance from the General. Somehow the captions of the top and bottom pictures on page 11 have become transposed, and on page 10 Mallet 261 is of course 961. The stock of the East German special was in fact "our" stock which we used throughout. We should have had the special that day, but the East Germans, being Embassy staff, received preference.

The repeat tour will now be in September, 1980, and other tours with narrow gauge interest are planned to Hungary, Pakistan, USA (including the D&RGW), Roumania and Switzerland. Send a large s.a.e. if you require details.

TEFS, QUORN, LEICS. LE12 8AX — BILL ALBOROUGH—Tours Director

A WAGON AT WINDERMERE

I was intrigued by Ted Wade's article, but cannot identify the wagon or suggest its origin. I don't know anything about pier tramways in Windermere itself, but there was a short line at Lakeside for coaling the steamers, which may be the one to which Peter Lee refers. I saw this in 1958 (when I would be six) and if I remember correctly the gauge was no more than 2ft.

No exact location is given* but I can suggest three sites on the west bank of Lake Windermere which may be connected with the wagon.

1: Cunsey bobbin mill. This is at grid reference SD 383937, about five miles north of Lakeside, and is now a joinery works. The first edition 25in O.S. map shows a tramway connecting the works with a pier on the lake, and although I have not examined the site in detail, Tim Hudson made a hurried visit recently but found no trace of the railway.

2: An inclined tramway at Belle Grange, running from about SD 377986 to 386993. It was in place in the 1920's and may have been used for forestry work.

3: Charles Fyldes' railway at Sawrey, reputedly behind the pub at about SD 380955. The line was used for hauling timber, with a home-made 2-2-2 tender loco of about 3ft gauge named LAVINIA. Photos of this have been published, the loco shown coupled to a low-side wagon similar, but by no means identical, to that described in the article.

The wagon seems far too "pretty" to have been associated with the mineral industries, features like the chamfered frames andpyramidal tenon joints suggest some domestic purpose, (I would call Fyldes' line "domestic") or for one of the woodland industries. The gauge of 2ft 8in is unusual. The only local lines of this gauge I know were a contractor's line at Foxfield on the coast, and a brickworks line at Barrow. These ceased to exist in 1908 and 1893 respectively.

BARROW-IN-FURNESS, CUMBRIA — PETER HOLMES

**Ted Wade adds that the wagon was at SD374906 or SD 375894, probably the former.*

THE HARLECH TRAMWAY

I was delighted to find this article in No 84, and congratulate Mr Clayton on his efforts with this elusive little subject, which only goes to prove my fallability as to its route. The paragraph in my Mid-Wales book was hurriedly added after exhaustive fieldwork and local enquiry to establish the route had left me so much in doubt that my map deduces that the quarry and Tramway routes were one and the same. Keith Turner, in his recently published *North Wales Tramways,* (using most of the quotations given by Mr Clayton) acknowledges that evidence of the route is impossible to find.

According to the elderly folk I interviewed—and perhaps here was my downfall—there was a connection (though not physical) between the quarry line and Holland's initiative, so here is a nice little exercise for someone on holiday to link the quarry to the subject. So clearly did my informants affirm that the quarry system carried visitors to the Bathing Place (sic), that I am tempted to wonder if at a period some informal trafficking was done. Speculative, but not unheard-of!

MALVERN, WORCS. J.I.C. BOYD

I know the Harlech area well, as it is my favourite holiday district, and a lady acquaintance, now 92 years of age, recalls the tramway in service. Since she was born in 1887 the line must have been operating for some years after this date, though not perhaps every year.

ABERGELE, CLWYD R.E. WRIGHT

I carried out some research into this Tramway about twenty years ago, and can add a little to Mr Clayton's article. In 1964 I consulted the Cambrian Railway minutes, then held by the BRB, British Transport Historical Records at 66 Portchester Road, London, W2, and discovered this report:

"Cambrian Railways Company Engineer's Report to Traffic & Works Committee, 21st June 1878.
New Tramway to the Sea Shore at Harlech.

I submit letter from Mr Thomas Roberts of Portmadoc, Agent to Mr Holland, MP, with reference to the above matter.

(copy)

Portmadoc
13 June 1878

"My dear Sir

Mr Holland wishes to have Wicket Gates made at your level Crossing near Harlech, to improve the access to the Narrow Guage (sic) Railway now being made to the Beach.

Will you kindly lay the matter before your Directors. Of course, Mr Holland will gladly bear the expense of putting up the Gates.

Your early reply will oblige.

Yours faithfully,
Thomas Roberts

"Geo Owen, Esq, C E, Cambrian Railways, Oswestry.

Mr. Holland has constructed a Tramway for the purpose of conveying Passengers from the foot of the Cliff to the Beach, distance about ½ mile, and the only means of access to the proposed commencement of such Tramway is through the occupation Level Crossing, the gates of which are ordered to be kept locked.

In the absence of a man in charge, the visitors at Harlech have hitherto been compelled to climb over these Gates to reach the Beach.

I would recommend that Mr Holland be allowed to put in the Turn stiles, the work to be carried out at his expense and under my superintendence.

I have the honour to remain, My Lord and Gentlemen, Your Obedient Servant,

George Owen.

The Golf Links, now the Royal St David's Golf Club, held their first meeting in 1894. The date 1899 is that of the first map on which it appeared. In 1962, Major R F Tomlinson, the club Secretary, wrote:

"The embankment on which the old tramway used to run across the flat land to the sea shore is clearly visible from the hill above, but this is really all that remains. it is possible that certain old buildings in the vicinity might have been connected with the tramway, but I regret that I have no precise knowledge of this".

I visited the site in October 1962, and the accompanying photograph shows the embankment quite clearly. Quarry Cottage is visible in the centre background, and I seem to remember that the shed near the railway was still there.

EDGWARE, MIDDX. E.D. CHAMBERS

(Mr Chambers' letter sheds more light on this tramway, and the embankment shown in his photograph certainly appears to be in the right location. As my direct interests lay elsewhere I did not persue the leads, but when passing through Harlech in August 1972 I paused briefly to try and identify the course of the tramway from the hillside with the aid of binoculars. However, the view was partly obscured by trees, and the rough dunes, covered in wind-blown grass did not encourage close investigation. — D Clayton).

(A colleague who regularly plays golf at Harlech confirms that the embankment is clearly visible in autumn and winter, when the grass is dying back. — Ed.)

RAILWAYS OF RÉUNION

The state railway on Réunion was much longer than the 80 km quoted by Derek Bayliss in his letter in NG 85. The line followed the coast quite closely for about two-thirds of the circumference of the almost circular island, from St. Benoît to St Pierre, via St Denis (the capital), Le Port and St Paul, a total distance of 125.2 km. It was opened throughout in 1882, though not all on the same day, and was the first railway in any French overseas territory, apart from the penetration of some Indian Railways branches into French settlements in India. According to an article in *La Vie du Rail Outre-Mer* in 1964, most of the system closed "by 1959", not in 1963. The latter date was mentioned in *Narrow Gauge News* at the time as a final closure, but was incorrect, for, as Derek's letter states, the last remnant remained until 1975. As for sugar cane lines, the official French 1:100000 map of 1971 shows no railways except the remnant of the public railway from La Possession to St Denis.

NEWCASTLE, STAFFS. K.E. STRETCH

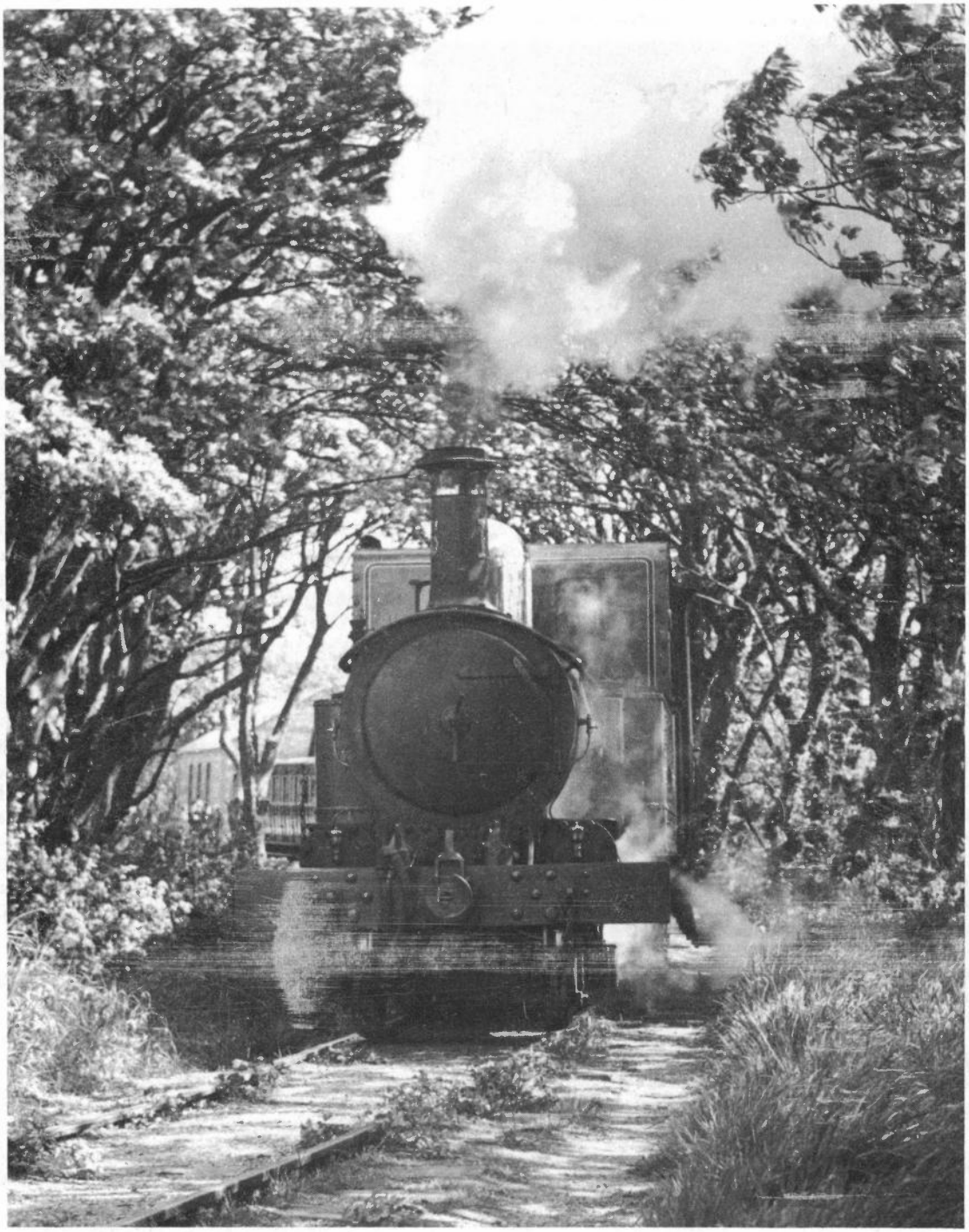
STEEPEST ADHESION WORKED GRADIENTS

May I offer the following poetic comment on Mr Wade's rather tart letter in No 85:

LIMIT OF ADHESION
A narrow gauge engine called WADE
Once stalled on a very steep grade.
With its very last puff
It cried out "That's enough!
This grade should have never been made!"

DIDCOT, OXON. HENRY GUNSTON

(To preserve our sanity this correspondence is now closed! — Ed.)



The timeless charm of the Isle of Man Railways is well portrayed in this view of No 13 KISSACK leaving Castletown with a train for Port Erin. *(Manx Press Pictures)*