THE NARROW GAUGE

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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, Preston and Stoke-on-Trent. Annual subscription £3.50 due 1st April.

THE NARROW GAUGE

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EDITORIAL

One of the saddest aspects of our hobby is the steady disappearance of the narrow gauge railway for anything but pleasure purposes. Already the operating industrial narrow gauge railway in this country is a rarity outside the peat, mining and tunnelling industries while former narrow gauge paradises such as Spain and Jugoslavia are all but finished and the steady progress of dieselization and closure is even beginning to affect such formerly impregnable strongholds as India and Poland.

Fortunately, such is the strength of the preservation movement, at least in Britain. that anything of real interest still surviving is unlikely to be destroyed, but things are by no means so happy when it comes to the recording of the history of these railways. No research, however diligently carried out, can be a substitute for first hand accounts from those who were actually involved in the building and operation of these railways. None of these people are getting any younger, and the recording of their knowledge is a task that should be given a high priority, for once they are gone their knowledge will be lost forever. The recent tragic deaths of several men who formerly held important positions in the Leeds locomotive building industry has convinced your editors of the urgency of this task and we are sure many other members know of similar people that they always meant to go and see but never did so before it was too late.

Cover Photo: Narrow gauge centenarian. Ex Pen-yr-Orsedd Slate Quarries DeWinton 0-4-0VBT CHALONER is seen returning to Pages Park on the Leighton Buzzard Narrow Gauge Railway with a members train on July 2nd , 1977. *(Kevin Lane).*

A YORKSHIRE CLAY MINE RAILWAY

NAYLOR BROS. (CLAYWARE) LTD., DENBY DALE.

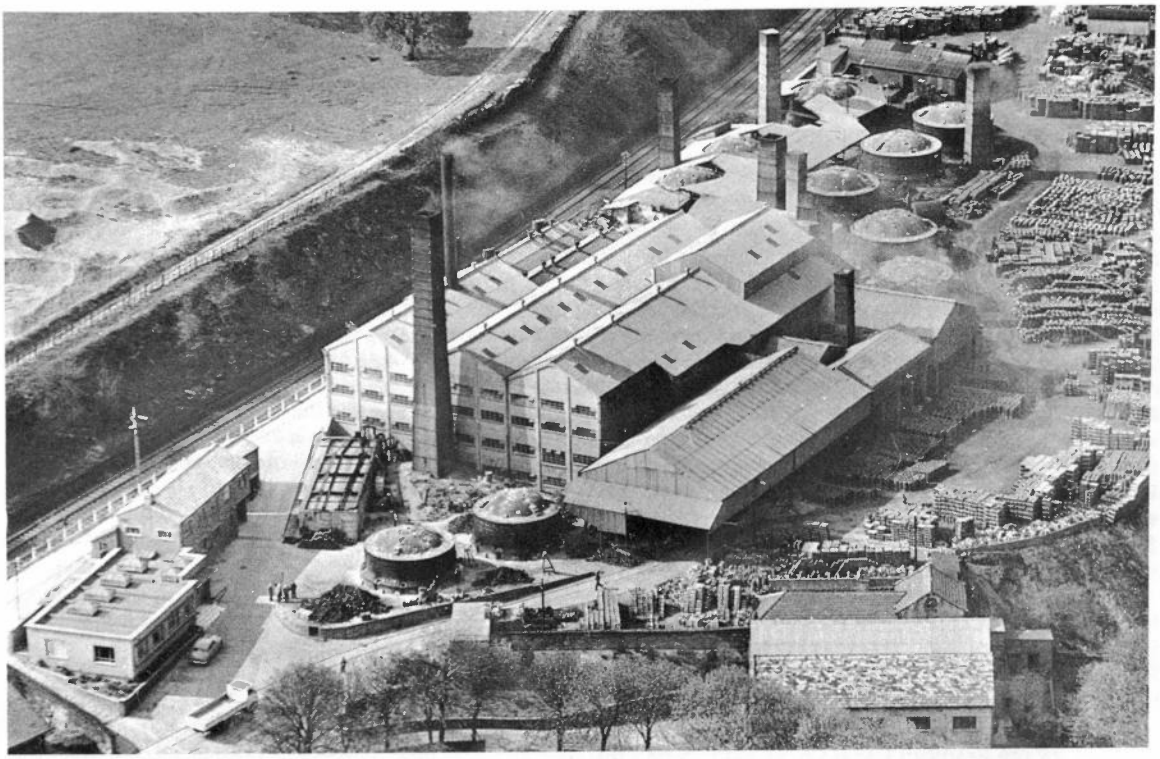
M. Swift

Narrow gauge industrial railways have existed from the earliest days of rail transport. Most relied on manual or animal motive power at first, but in Victorian times the development of steam engines enabled the more prosperous concerns to introduce chain or cable haulage, or, in some cases, locomotives. Modernisation continued after the First World War, following the development of reliable internal combustion machines, and accelerated during the next twenty years as mass produced petrol and diesel locomotives became available. During this period hundreds of quarries and pits loaded granite, limestone, clay, chalk or gravel into side tipping wagons to be hauled away over a few hundred yards of often indifferent track to the processing plant. Although these systems were scattered over the whole country, most were in rural surroundings and remained unknown to the few who took an interest in industrial railways. It was only in the 1950's that enthusiasts began to search them out, but by then the number was declining. This trend started soon after the Second World War, when improved tyred vehicles specially designed for off-the-road service, and other bulk handling devices were produced. Changing economic circumstances led to closure of many small plants, or their amalgamation into larger concerns with more capital available for modernisation. All these factors, combined in some cases with exhaustion of the mineral deposits on which they relied, marked the end for many small railways until now only a handful remain. This is the story of one typical line, almost unknown to anyone not directly concerned in its operation, which closed twenty years ago.

Naylor Bros. have a very long history with roots in the early days of railway construction. In 1844 George Naylor entered into partnership with Samuel Pearson of Scholes, and Joseph Roberts to found Naylor, Roberts & Pearson, Contractors. This partnership was dissolved in March, 1860, and Samuel Pearson went on to found S. Pearson & Sons, one of the greatest railway and civil engineering contractors of the Victorian era, who carried out extensive works in many parts of the world. About 1870 George William and Thompson Naylor, George Naylor's sons, founded Naylor Brothers, railway contractors at Cleckheaton, Yorkshire. Securing their first contract for the Bradford Canal Co. in 1873, during the next 45 years they carried out railway construction for the Lancashire & Yorkshire, London & North Western, Midland and North Eastern railways, and reservoirs at Ladmanlow, near Buxton, and Greenfield. Masonry work seems to have been a speciality, and several viaducts and retaining walls built nearly a hundred years ago survive as a monument to their craftsmen. Their last railway contract was the Bray—Greystones diversion for the Dublin & South Eastern Railway during 1913-16. Two narrow gauge steam locomotives are believed to have worked on this job.

Denby Dale village is situated in the deep valley of the River Dearne, east of Barnsley, Yorkshire. Its principal claim to fame is the local tradition of baking monster pies to celebrate national events, eight being produced from 1788 to 1964. The Huddersfield—Penistone railway crosses the valley on an impressive stone viaduct nearly 400 yards long and 112 feet high, dominating the village, and it was this that brought Naylor Bros, here in 1877. The L.& Y. R. had awarded them a contract valued at £27,659 to build a stone viaduct replacing the original timber trestle dating from 1849. Work started late in 1877, the last arch was keyed in during 1879, and the official opening took place on 16th May, 1880. In 1884 the firm received a further contract for £900 to remove the old timber trestle, containing 80,000 cubic feet of timber valued at £1600.

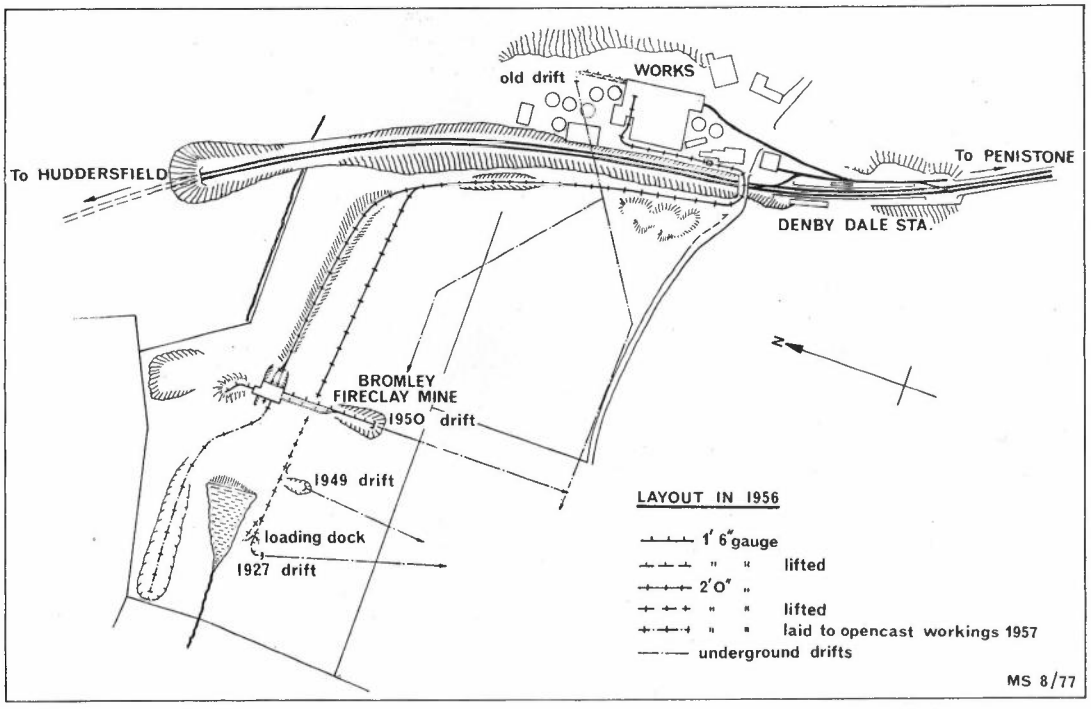
Seams of coal and clay outcropped in the Dearne valley, and a number of small mines were in operation during the 19th century. The first clayware works in Denby Dale was established in 1878 by Joe Kitson & Sons on a site immediately below the viaduct then under construction by Naylor Bros. The contractor must have had a yard adjacent to the viaduct, and it is logical to expect that this was on the land currently occupied by Bromley Works, where there was direct access to the railway goods yard. Woodbine House, still the Naylor family residence, was built adjacent to this site in 1881, but unfortunately the date on which the clay works was established has escaped record. However, by 1880 there was a growing demand for pipes and tiles for drainage, and the contractor may have seen the opportunity to enter another business in what has since proved to be an ideal location. Clay was obtainable on the site from the Whinmoor seam, four feet thick and slanted up to the west from the outcrop east of the railway. The fireclay is overlain by a seam of coal 9in to 15in thick, useful for boiler or kiln firing, making the works self-sufficient in raw material and fuel. Bromley Fireclay Mine, as it became known, is thought to have been started in 1884. A drift was driven into the seam from the outcrop in Bridie Wood Bottom. This drift inclined slightly upwards following the slant and was therefore self draining. Although the works is not shown on the Ordnance Survey map prepared in 1891 this is no guarantee that it was not in production at that date. By 1900 it was certainly well established, and by 1923 when the mine was fully surveyed, the drift extended well beyond the railway, then divided into separate parts of the mine.



This aerial view of Naylor Bros. (Clayware) Ltd. shows Denby Dale works about 1953, and clearly indicates the extent of reconstruction carried out after the fire. The original works area has been extended considerably by tipping, completely altering the former contours, and obliterating the first mine drift. From Bromley Fireclay Mine, the 2ft gauge railway can be seen leaving the cutting, following the standard gauge line, then returning behind the office at the lower ***left.*** *A road lorry stands on the standard gauge siding running in front of the office to the despatch bay.* *(Naylor Bros. (Clayware) Ltd.)*

Brick and clayware producers in the West Riding of Yorkshire used angle plate, flatbottom or bridge rails, and a variety of gauges between 11½in and 2ft. Naylor Bros. had 18in gauge track with edge rails laid in Bromley Mine. Loaded tubs were trammed downgrade by hand to the drift mouth, from where a double track incline ascended to the works. Full tubs were hauled up one track on a cable driven by a steam winch, and emptied on a gantry over the clay grinding pan. Empties were returned down the parallel track for refilling in the mine. During the early 1920's an endless chain haulage was installed on the incline, each tub being fitted with a fork at one end to engage with the chain. The tubs had a very short wheelbase, and sometimes tipped on the incline because of the tension on the chain. The operators soon discovered that a lump of clay hung on the back of the tub solved the problem! About 16 miners worked underground at that time, a heavy job drilling the clay, blasting and then loading it into tubs which had to be trammed underground for several hundred yards to the drift entrance. The only light came from candles stuck near the working face, or on the buffer of a tub. The whole area had been worked for coal in the mid-nineteenth century, and miners would occasionally break into these old workings which had never been surveyed. Tools were often found, sometimes coal sleds and "penny-wheel-rails" (light angle tramplates) abandoned by the workmen of an earlier age.

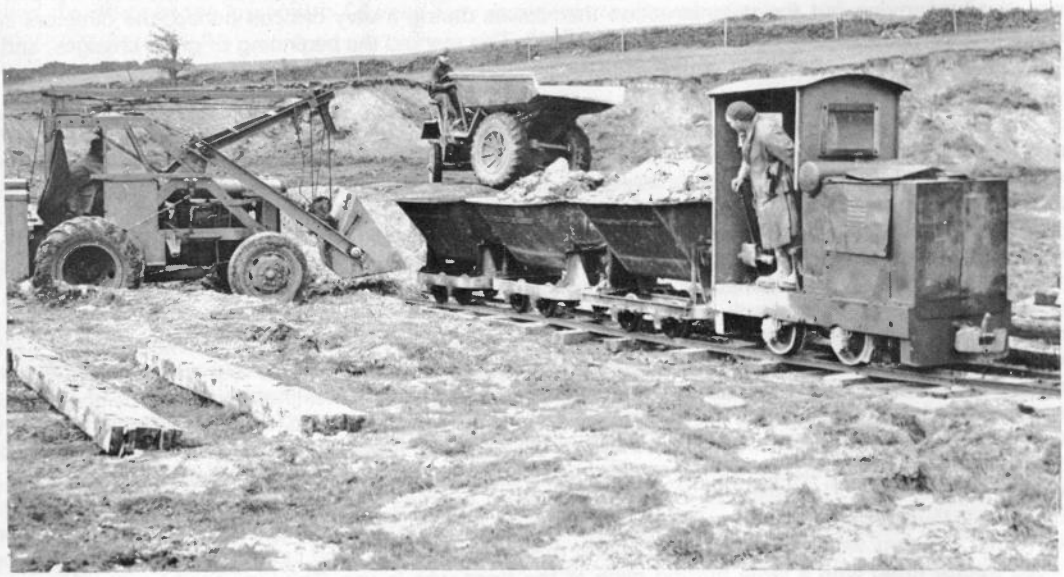
In 1926-27 two new drifts were opened up in the fields beyond the railway, giving better access to parts of the mine remote from the works. The clay was quite near the surface, and the drifts slanted upwards from the entrance in the side of a narrow valley. These new drifts avoided the long underground haul, and an 18in gauge line was laid on the surface. Lads were employed to tram tubs over this line, a distance of 800 yards from the drift to the works. The original drift became disused, and the entrance and incline have disappeared under new kilns and waste tips. The 18in gauge surface line apparently had a very short life, being replaced by 2ft gauge track and 1½ cubic yard "Jubilee" side tipping wagons more suited to the task.



The years from 1930 were apparently uneventful, but in 1938 the firm, previously trading as Naylor Bros. (Clayware), became a limited liability company and added the abbreviation "Ltd." to its trading name. The following year war broke out, and like many similar organisations the works were hard pressed to meet increased business, lack of materials, and loss of staff drafted for service in the armed forces. Women were therefore recruited to take over tasks on the manufacturing side. As the war drew to a close a bright future seemed within reach, but in April, 1945 the works caught fire and was almost totally destroyed. This could have been the end of the story, but by carrying out the reconstruction themselves during a very difficult period, the directors and employees had the plant back in production by early 1946. This marked the beginning of great changes, and is therefore a convenient opportunity to review operations.

Mining had changed little from the 1920's. Clay was dug by hand from "stalls", and large "posts" were left intact to support the roof. About eight miners were employed. Each had to lay track and fit roof timbers in his own stall, fill 12-14 tubs each day and tram them in and out of the mine. The tubs had wooden bodies with steel corner plates, and steel strengthening flats along the top of each side. An oak frame was fitted, with side members extended to form dumb buffers, banded in iron, but no couplings. Spoked wheels were fitted to axles running in simple plain bearings, spaced close together to ease tipping and handling in the confines of the mine. Candles were still used for lighting, only being replaced by battery lamps in 1947. A small cabin stood at the mine entrance, used by the deputy and men at "snap" (meal) times. Loaded clay tubs were trammed out onto a loading dock above the 2ft gauge track, and the contents tipped into the side tip wagons below. Loaded wagons were replaced with empties brought by hand from the storage siding. A local farmer led his horse to the works for a few hours each day, hauled the loaded wagons from the mine in trains of two to four and returned with the empties. A number of wagons were braked, and it is suggested that sometimes these were run by gravity from the summit of the line alongside the main line railway. Each wagon was weighed, then propelled to the end of the works and tipped into large storage bunkers before being ground and mixed. Most of the machinery in the works was driven by a 300 h.p. horizontal tandem compound condensing steam engine which remained in service until around 1960. The despatch bay was served by a siding from Denby Dale station goods yard, probably installed when the works was established, and coal for the kilns was delivered here, and some pipes sent out by rail. Wagons were originally moved along this siding by winch and cable, but by 1946 a small four wheel road tractor fitted with a large buffing plate at the front was in use. This was tried hauling 2ft gauge wagons from the mine, replacing the horse, but its small wheels and the soft ground over which the line was laid presented problems in wet weather. The sharp curves and steep gradient across the railway bridge were particularly hazardous, especially when the wagons were pushing the tractor!

Excavating clay from the Whinmoor seam in Bromley Fireclay Mine, 1948. Note the wooden tub standing on temporary rails lying directly on the floor without sleepers. One rail is turned on its side with the wheel flange running in the web. A battery lamp stands on the tub, and just to the right a shot hole is visible. *(Naylor Bros. (Clayware) Ltd.)*



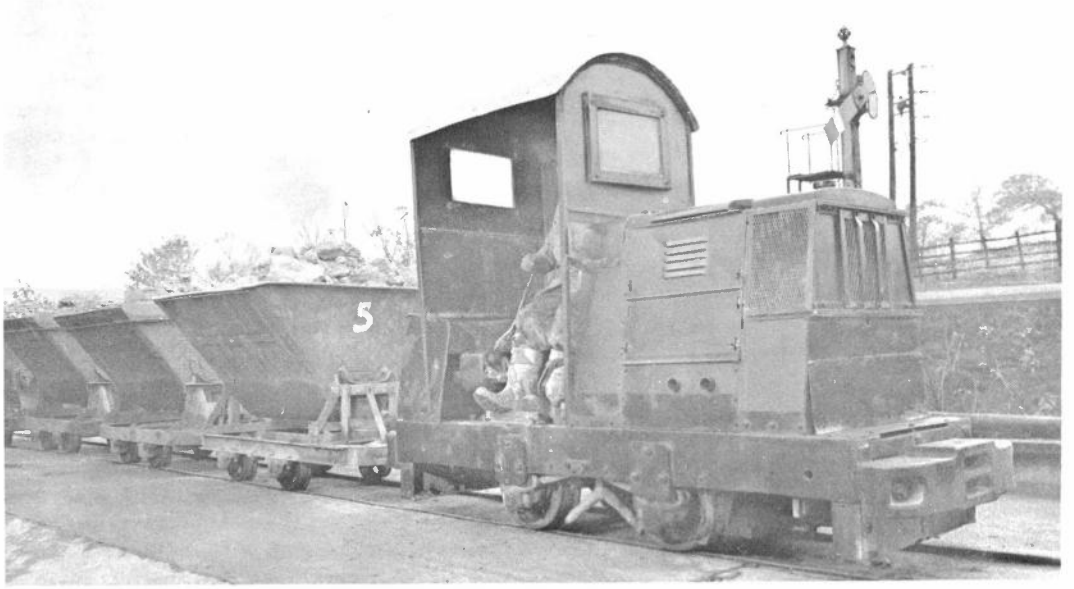
Loading clay in the short lived opencast site, February, 1948. The locomotive is the unidentified class 12HP Ruston & Hornsby diesel. *(Naylor Bros. (Clayware) Ltd.)*

So, in the winter of 1946/47, the first locomotive arrived. This was a Ruston & Hornsby class 12HP, weighed 2½ tons, and was fitted with a two cylinder Lister 10/2 engine. Built in 1936/37, it had already seen ten years service with previous owners, but despite exhaustive enquiries its origin and identity remain unknown. Although it was old and reluctant to start on cold winter mornings it was a great improvement on the horse or tractor, and capable of taking three or four loaded wagons each trip. During the severe winter in early 1947 several runs had to be made to clear snow from the rails each morning. A sheet steel cab with one side open and glazed windows front and rear was fitted, probably after its arrival at Denby Dale.

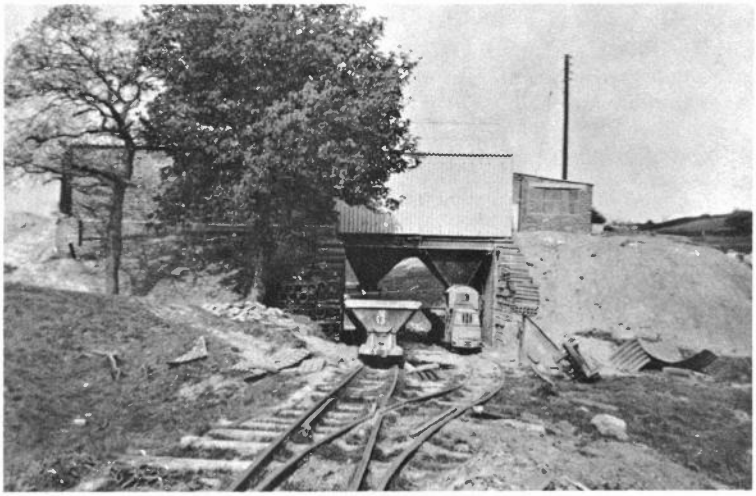
By 1947 Bromley Mine had extended its workings over the entire area available to Naylor Bros., and from then on mining was concentrated on removing the posts of clay left behind in earlier times. The same year a small opencast site was started on the opposite side of the valley to the drift, where there was only a few feet of topsoil over the Whinmoor seam. To remove the clay a mechanical shovel was brought in, and the 2ft gauge track extended into the site to allow direct loading into wagons. This opencast method of working was only employed for a few months.

To improve the mine a completely new drift was opened in 1949, followed by the final drift in 1950, striking directly into the centre of the clay reserves. This drift was laid out on modern lines, the roof being supported by steel arches for 300 yards from the entrance to the main pass-bye. Electric lighting was installed throughout. A single 18in gauge track ran up the drift, and tubs were hauled out in trains by cable and electric winch. Outside the drift the track divided into two, and entered a large unloading shed built over two 2ft gauge sidings. Tubs were detached from the cable, pushed by hand over the steel plate floor and emptied into one of two hoppers, then returned to form an empty train on the other track ready for lowering into the mine. Waste rock or rubbish tubs were pushed across the floor onto a third track which emerged from the rear of the shed onto a waste heap. To reach this shed a new 2ft gauge branch was laid, leaving the original line near the summit, and descending along the side of the shallow valley on an embankment largely built from reject pipes and rubble from the works. The new line was at a much lower level than the original, and laid with heavy flat bottom rail on cut down standard gauge sleepers. At the loading shed the single track divided into two sidings, one under each loading hopper, which had sliding closure plates to allow intermittent loading of wagons.

The original and new drifts were worked together for a time, but after a few months the original drift was closed down. A second locomotive arrived in 1950, and the 12HP Ruston & Hornsby was disposed of, probably for scrap, although this cannot be confirmed. The replacement was one of a large batch of Ruston & Hornsby class 20DL machines ordered by the Ministry of Supply, carried serial number 223736 and was delivered in

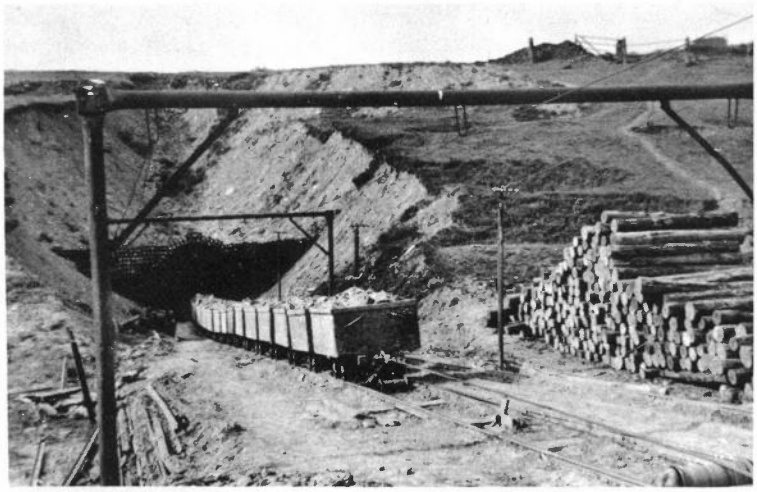


A special posed view of the 20DL Ruston & Hornsby locomotive, cleaned up for the occasion, behind the office block with a loaded train. Probably taken about 1954, when the locomotive still retained its wartime olive green livery. *(Naylor Bros. (Clayware) Ltd.)*



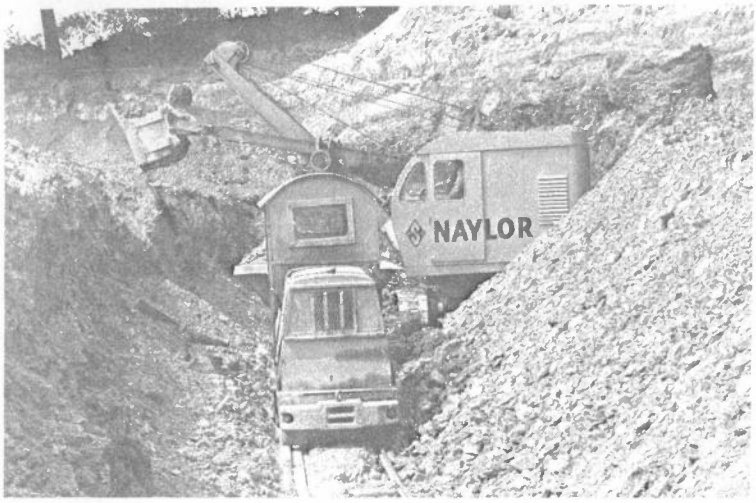
The loading shed at Bromley. The line from the mine entered at the left. May, 1956.

(M. Swift)



A run of tubs being hauled out of the new drift at Bromley into the tipping shed, July, 1956.

(M. Swift)



The last days of the 2ft gauge, working clay from the opencast site at the extreme edge of Naylor's mining area, 1957.

(Naylor Bros. (Clayware) Ltd.

February 1944. It had a Ruston 2VSO engine developing 20 h.p., and weighed 2¾ tons. Like many of its sisters, this locomotive had probably done little or no work when it arrived at Denby Dale from an Ordnance Factory disposal sale.* A cab similar to that fitted to the previous Ruston, but with a more rounded roof, was fitted. Originally painted in olive green, it was repainted in light grey some five years later, loosing its "wartime" appearance.

It was about this time that I first visited the line whilst investigating coal and clay mines in the surrounding country. Bromley Fireclay mine was in full production, with regular runs of tubs being hauled out for loading onto the 2ft gauge. Fifteen tip wagons were in use, numbered between 1 and 17, and most had their capacity increased slightly by extended sides. There were two flat wagons converted from tip wagon frames to carry rail, sleepers and other materials. From the loading shed the line climbed on its embankment to join the original high level line to the old drifts, now disused except for wagon storage and the occasional load of mine props to the mine entrance. Turning alongside the main line railway, the narrow gauge reached its summit, cut through the edge of the valley in a shallow cutting, then dropped steadily to the stone occupation bridge by Denby Dale station. Part of the field beside the railway was used as a stocking ground for extra clay from Bromley, or brought in from other mines in the area. When required this was loaded into tip wagons on the narrow gauge by mechanical shovel, and hauled by the locomotive to the works. The track, fitted with check rails, curved sharply on and off the bridge then ran behind the office block where the weighbridge was located, along beside the works and round another sharp curve to terminate on an open gantry above the clay storage bunker.

The rails over the bridge and beside the works were laid in concrete to allow road vehicle access. The total length of track was about 700 yards. The locomotive could not pass beneath the hoppers at the mine, so was always at the works end of the three or four wagon train. When not in use it was stabled above the clay bunker, where routine maintenance was carried out.

By 1957 the mine was virtually worked out, and the last clay was extracted in April of that year. An excavator was obtained, and a hopper removed from the unloading shed to allow the locomotive to work through over a 200 yard extension to an opencast pit on the site of the 1948 excavations. This prolonged the life of the railway into the summer, but improved weather enabled a dumper to take over. The Ruston was parked under the unloading shed and given a new coat of light grey paint, but only worked at odd times that autumn when the ground was too soft to use the dumper. Finally the remaining clay on the site was removed, and supplies began to arrive from other mines in the vicinity. Rails and equipment were salvaged from the mine, and the entrance filled. In November 1957 a start was made to lift the 2ft gauge track back from the mine to the works, using the Ruston and two wagon frames. Rails and sleepers were stacked in the field beside the bridge, and the remaining wagons run off the track. It was September 1958 before the track was lifted back to the bridge, and even then a short section in the field was retained to hold the lifting train. This stood there for a further year waiting for a buyer, and was finally sold to a firm in the Stocksbridge area, reputedly for scrap, late in 1959. The rails set in concrete behind the works were left, and still remain to this day. Of Bromley Fireclay Mine there is nothing but a memory. Legislation on the restoration of mineral workings not only prevents mine operators from leaving some of the eyesores which were common in the past, but also leaves nothing for the industrial historian to reconstruct the past. The entire area of Bromleys has been smoothed out, soiled and seeded, and supports agriculture once more, although further up the hill a large new opencast quarry is still excavating the Whinmoor seam.

It is over twenty years since clay was hauled from Bromley Fireclay Mine along the narrow gauge, and the clayware industry has passed through many many changes. Unlike many other small firms, Naylor Bros. have succeeded in maintaining their independence, and improved their position by a far sighted programme of modernisation and development.

Because of the almost complete absence of written records, preparation of this article would have been impossible without the memories of present and former employees. I must record my special thanks to the Directors of Naylor Bros. (Clayware) Ltd., and particularly B. Riding. P.A. Hepworth, Works Manager, and J. Taylor, mechanic at Denby Dale. B. Haigh, landlord of the White Hart, Denby Dale. D. Daniels, W. Moorhouse, B. Peace and A. Washington, now retired. Our members C. and D. Lawson and E.S. Tonks for information on Ruston & Hornsby locomotives, F. Jux for information on S. Pearson, and A. Neale for bringing to my attention an article on the firm in *"The British Clayworker"*, 15th February, 1949, which started this research. Kirklees Local Studies & Archives Library for historical information on Denby Dale.

**Ruston & Hornsby records list spares sent to Naylor Bros. (Clayware) Ltd., Denby Dale for 20DL serial number 223713 in July, 1953. However, this locomotive returned to the maker's works after the war, and was resold to M. Gomez, the Ruston & Hornsby agent in Lisbon. Because there was never a third locomotive at Denby Dale it seems that the spares record is incorrect in respect of the serial number listed.*

DAY OUT AT MATHERAN

C.M. Jackson

Nothing much stirred in Bombay Docks in the early morning darkness as I walked ashore from my ship. I was making for the Victoria Terminus of the Central Railway of India, where I was to catch the 07.00 Deccan Express for the seventy mile run to Neral, there to change trains and catch the narrow gauge to Matheran.

Matheran (Matheri dialect for 'forest on the hill') is one of the numerous Indian 'Hill Stations' which perform the function of holiday resorts and convalescent centres. It was as the latter that most of the hill stations came into prominence, mostly during the British 'Raj' when the coolness and pleasant breezes associated with the altitude, and the far healthier water supplies were of great benefit to sick Europeans, who proved very susceptible to local diseases in the oppressively hot and humid lowlands. In time the hill stations developed as summer retreats and resorts, and Matheran being close to Bombay is extremely popular, particularly with honeymooners. Matheran is overshadowed however, from the narrow gauge enthusiast's viewpoint, by the better known hill stations of Simla and Darjeeling, with their famous access railways. The plateau of Matheran rises very steeply from the broad coastal plain, and is about five miles long by a mile wide, with the hilltop densely forested, some 2000 feet above the plain. Matheran has always been difficult to access, and this prevented expansion of the hill station for many years. The town was slowly developed from about 1850 but until the coming of the railway the only access was by foot or pony, and each year reverts to this method during the monsoon season. Today there is no road access, merely paths, and the only wheeled transport on the hilltop is by two man Indian rickshaws (one 'driver' and one 'banker' for steep gradients!) and most people either walk or ride ponies. Construction of the line commenced in 1905, funded by Sir Adamji Peerbhoy, a Bombay benefactor and entrepreneur; the 2ft gauge line was completed in 1907 and the original steam locomotives are still available for service, although most scheduled trains are diesel hauled. The railway was operated under private management from its inception until its amalgamation with the Great Indian Peninsular Railway shortly after Independence, with the exception of a brief period during and after the first World War when the G.I.P.R. had control. It is now part of the Central Railway system.

The line rises 2363 feet in about twelve miles, although the direct distance is about five miles. The ruling gradient is 1 in 20, with curves as tight as 40ft radius; these are more severe than the steepest on the Darjeeling Himalayan line (1 in 20 and 60ft) but the Matheran line is neither so lengthy as the DHR, nor does it run the whole year round, but closes during the monsoon season, due to the danger of washouts. By comparison the Festiniog has a ruling gradient of 1 in 70, with curves down to 116ft radius.

Dead on time the electric-hauled broad gauge express left Bombay and after clearing the rambling limits of the city, crossed a broad rolling plain which grew gradually drier and dustier, but was quilted with tiny fields of rice, ready planted and waiting for the monsoon rains, when the plain would turn green almost overnight. About 100 minutes from Bombay we pulled into Neral, a small dusty market town set between the edge of the plain and a broad meandering river, and I joined the crowd heading across the footbridge to the narrow gauge station, where a train of about a dozen small blue and white bogie coaches was standing beneath the canopy roof. Small as the coaches were, even tinier four wheelers stood on the sidings, together with a rake of modern-looking bogie coaches. Some equally tiny goods wagons stood on the exchange sidings, whilst an apparently disused turning triangle disappeared into the adjoining village. There was no locomotive on the train yet, but a few hundred yards away I could see several massive diesels standing in the compound of Neral shed, together with a couple of steam locomotives standing beneath an open-sided shed.

Whilst I was watching the activity in the station a large blue and white diesel grumbled out from the shed, coupled onto the train, and ticked over gently awaiting departure time. The loco looked fairly conventional, a large centre-cab bogie diesel, one of four built for the line by Arn. Jung in 1956. However closer inspection revealed that this was in fact an articulated diesel, a new animal to me. Each of the two power bogies had its diesel engine and hydraulics mounted on its own subframe, the cab being suspended between the two power bogies. The engine covers 'slotted" into the bodywork on the cab unit, and the effect was of a truly flexible locomotive, able to articulate about its centre. This full articulation avoided the excessive overhang of the 'normal' bogie locomotive, and therefore being ideally suited for the tight clearance and sharp curves of the Matheran line. No continuous brakes are fitted to either the diesel or steam locomotives, and all train braking is carried out by brakemen who ride between the coaches or in the wagons of goods trains.

A wholesale slamming of doors indicated imminent departure, so I regained my seat just before the diesel roared into life and jerked the train out of the station, picking up speed rapidly and accompanied by large numbers of children, running alongside the train and jumping onto the footboards. The train skirted the edge of the village and as we passed the shed I caught a glimpse of three neat blue painted tank locomotives, all apparently cold, although a hopeful sign was the 'outside' loco being coaled.

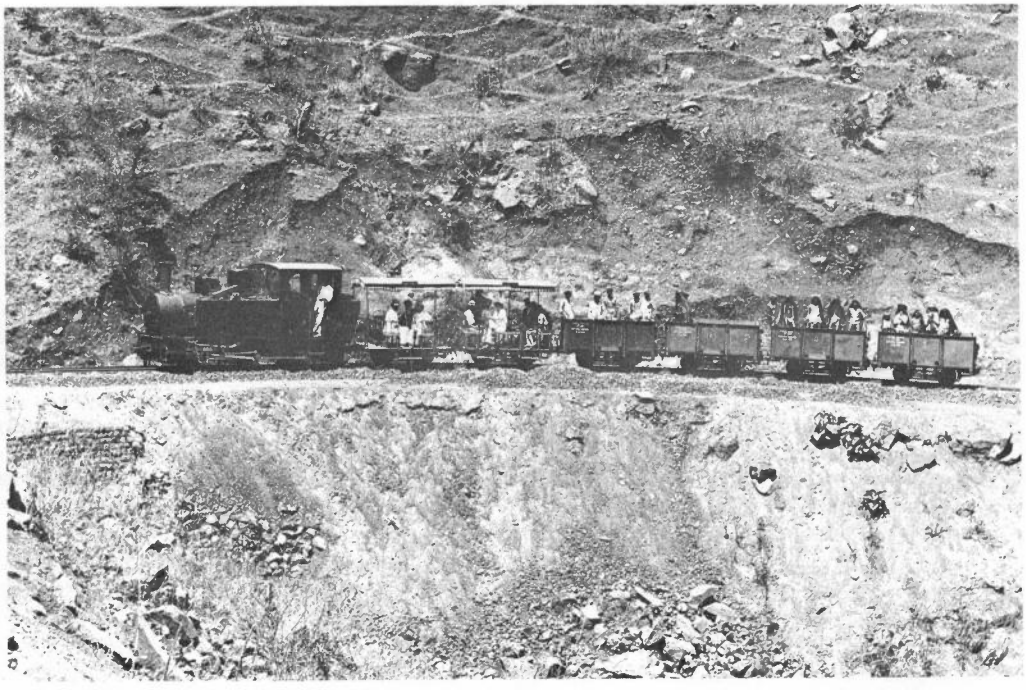
The reason for the rapid start was immediately visible as the train entered a long straight about a mile long, apparently laid directly up the side of a hill. This was the only noticeable straight stretch of track between Neral and Matheran. At the end of the straight the track climbed steeply along the contours of a low hill and the plateau of Matheran came into clear view, appearing as an almost sheer cliff, topped with a dark line of forest—it appeared rather improbable that this tiny train was to get us to the top.

Speed dropped considerably as the diesel bit into the grade and the train ground round the tight curves. The track was a classic piece of contour climbing, following every fold in the ground with minimal earthworks, and steadily gaining height. It was on this initial climb through the foothills that the tightest curve on the line occurred, a 45ft radius curve through about 140 degrees, and was preceded by a sign that read 'Oops what a curve'. Speed dropped to a crawl as we traversed this curve, but picked up slowly again, though during the whole climb speed rarely rose above a brisk walking pace.

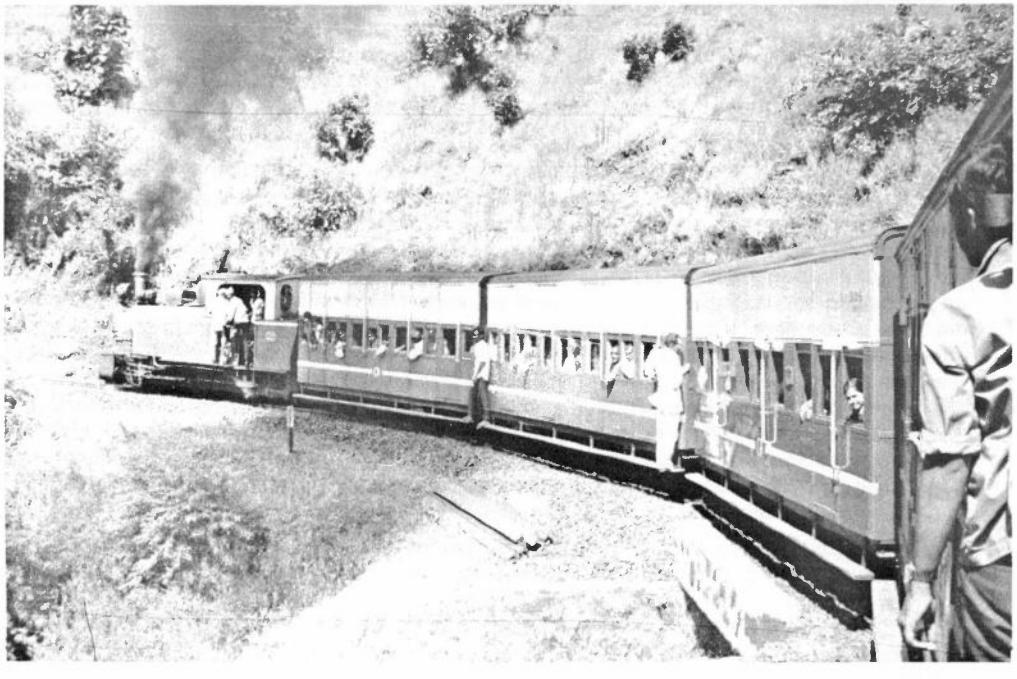
After about 25 minutes steep climbing the train crossed a saddle between two hills and a knot of people at the lineside resolved itself into local children, armed with baskets, who leapt onto the footboards and worked their way along the train, selling berries and fruit, and a local delicacy called 'Chikki' a teeth demolishing mix of sugar and nuts. A little later the train meandered across relatively level ground and pulled into the first passing loop of Jumma Patti, 792 feet above sea level, and about 500 feet above Neral. The station is impressively located, set on a patch of fairly flat ground, but dropping away very steeply down to the dusty plain. Already you could feel a pleasant breeze, and it was noticeably cooler; we now stood at the foot of Matheran itself, dominating the scenery, and rising another 1500 feet above us.

With much whistling and waving of flags the train pulled out of Jumma Patti and wound its way through rugged ground to the base of the escarpment, and the loop section of the climb began. For about the next half hour the train twisted and turned on a never ending succession of reverse curves; from my seat towards the rear of the train the loco was either invisible or appeared to be at right angles to me. It was fascinating to see the track well above gradually coming down towards you, often only a few yards away horizontally. Speed dropped to a crawl on the hairpin bends, these were often built out away from the hillside on stone embankments, and the view from these was superb. More vegetation was starting to appear, but it was still possible to see the track looping up the hillside below us, at one point I counted six distinct loops beneath us—we were making little horizontal progress, but were certainly climbing! It was on this stretch that we passed through the line's only tunnel, 35 yds long and set on a hairpin bend nicknamed "One Kiss Tunnel' no doubt in deference to its short length and the honeymoon traffic! As we gained height we crossed numerous dried up streams, and it was easy to imagine them in flood and the consequent damage during the monsoon season. Vegetation continued to increase, and at a height of 1591 feet we pulled into the second passing loop, functionally named Water Pipe, set in bush, with a fine view over the plain.

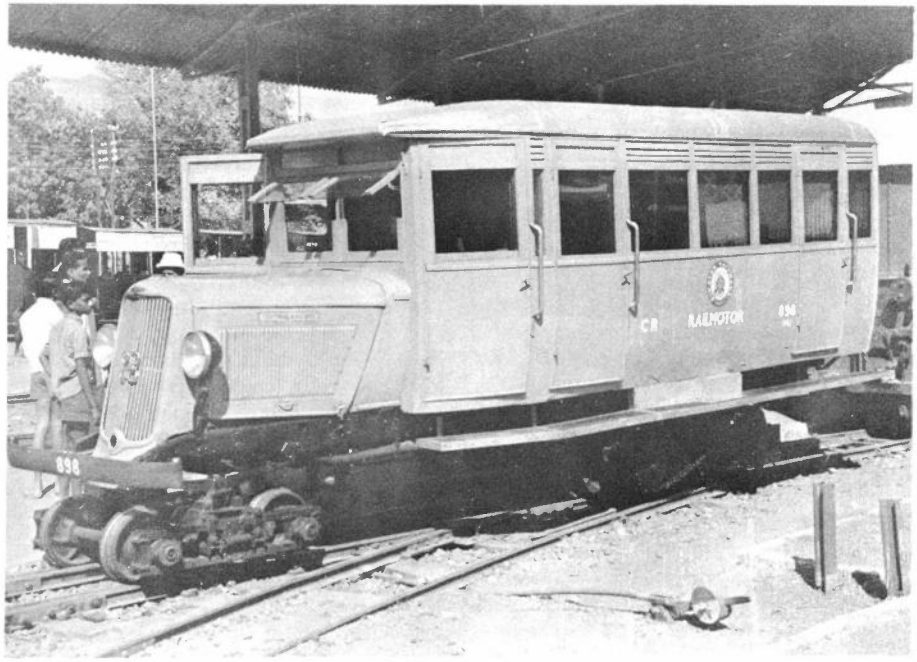
The looping ascent continued for a short while, until the slopes steepened even more. The line cuts through a spur of the hill in deep twisting cuttings, then heads along a gently curving shelf section, perhaps the most spectacular part of the climb, poised above a sheer drop that must have been well over 1000 feet. The scenery is superb, but not for the nervous; there is little protection, and the overhang of the coach gives the impression that the train is travelling without any visible means of support. The feeling of security is not enhanced as the coach is inevitably leaning towards the drop, due to passengers bunching to one side to admire the view! After about half a mile a horseshoe curve takes the line round the northern end of the hill, and the climb continues along the side of a wooded valley.



A posed view of the inaugural train on the opening day. *(Indian Railways).*



A carriage window view of a train en route. *(M.G. Satow).*



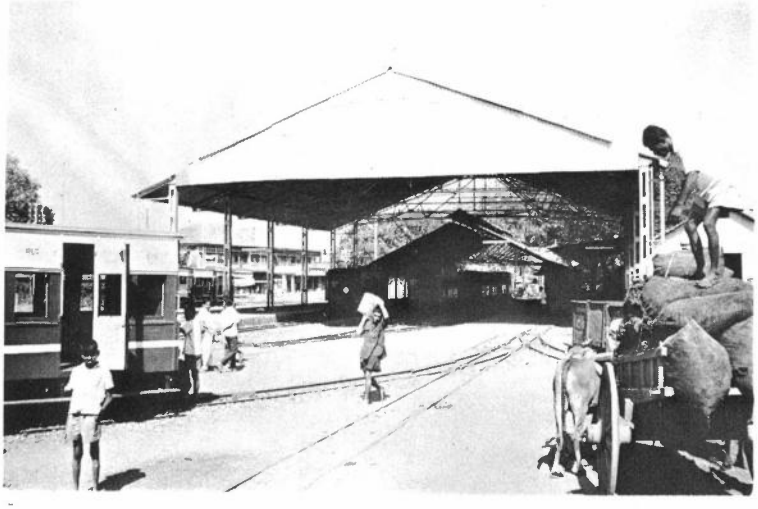
M.L.R. 898, the 1934 built Dodge railcar. *(M.G. Satow).*

Abruptly the train plunges into the hilltop forest which seems almost dark after the brilliant sunshine of the climb, but there are occasional bursts of sunlight as the train passes through clearings. The steep climb continues, but curves are now very gentle; there is one final pause as a few passengers disembark where a path crosses the line. Low wooden buildings appear below the line, usually with bales of straw on the roofs; these are the homes of the ponykeepers who provide much of the hilltop transport. Larger buildings appear above the line amongst the trees, and a red dirt road parallels the line. Abruptly the train bursts into sunlight to enter Matheran Station, scattering chickens and children, and pursued by porters. The gradient only eases at this point. Apart from the runround loop, there are a few sidings, a spur to the watertank, and goods sidings at Matheran, together with a balloon loop encircling most of the yard. The station has a short battered overall roof over part of the arrival tracks.

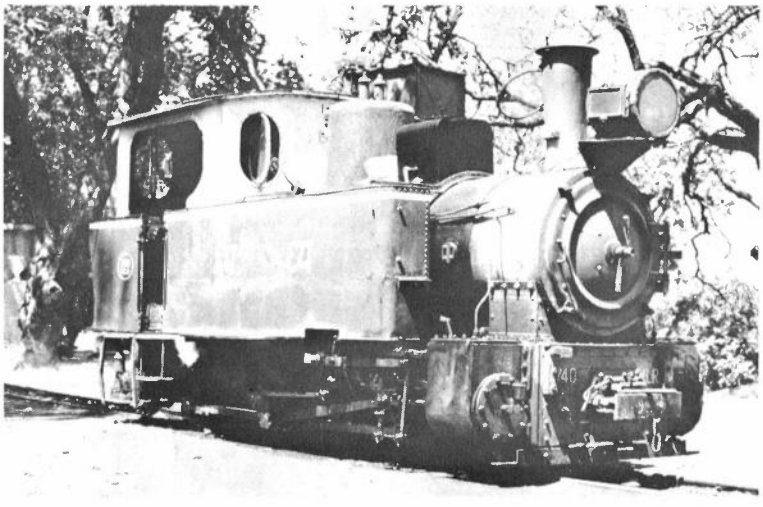
The main street of Matheran starts outside the station, and is lined with shops and eating houses, partially shaded by tall trees, with hotels set back from the dirt road; it is said that you can spot anyone who has been to Matheran by the red dust on their shoes.

After a brief pause for a snack I headed off along one of the forest paths, running the gauntlet of pony hirers and rickshaw teams, who appeared rather disgusted at the prospect of a visitor actually walking. The railway seemed to offer the best route for part of the way, and I walked through a dark tunnel of overhanging vegetation. At one time Matheran hilltop was completely forested, but until recently the forest had been under threat as trees were felled for firewood and building purposes, but the removal of the woods was leading to a distinct rise in temperature, and tree felling is now severely restricted.

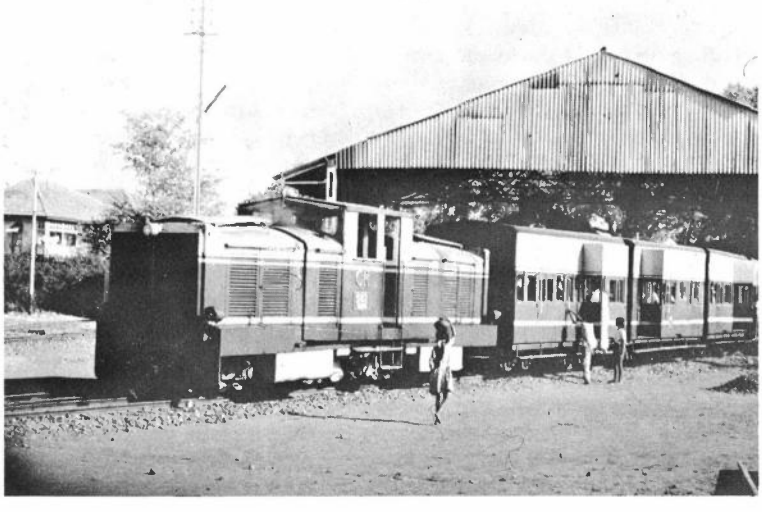
Leaving the line after a mile or so I headed through the forest, passing the occasional guesthouse (one operated by the Bombay Dying Company!), my only companions being an occasional monkey and suspicious rustlings in the undergrowth. After a stiff climb the path burst from the forest onto the edge of the cliffs overlooking the plain and Neral, and I could see the track looping up from Jumma Patti, finally vanishing into the bush at Water Pipe. As I sat there, regaining my breath and enjoying the silence and the scenery, I realised that I could very faintly hear the unmistakable panting of a steam engine, as yet out of sight. The train was obviously on the loop section of the climb as I could hear the exhaust beat almost stop, then slowly pick up again as the train left the hairpins and tackled the relatively straight climb between the bends. Whoever was driving certainly knew his job, only once did I hear the locomotive slip, but almost immediately regained its feet, and the steady beats resumed. Eventually the train came into sight almost a thousand feet below me; a tiny locomotive and mixed train, creeping caterpillar like round the curves, with a faint pall of smoke rising vertically above it.



The narrow gauge "train shed" at Neraj Junction. (M.G. Satow)



Radial axle OK 0-6-0T 740 at Matheran. (C.M. Jackson).



502 at Neral, preparing to leave for Matheran in March, 1976. (C.M. Jackson).

I managed to get back to Matheran for the arrival of the train, its approach heralded by much whistling as it crossed numerous paths, and finally coming into sight as it rounded the final curve, pursued by the inevitable children. My first impression was of a compact little locomotive, glistening under a sheen of oil, and looking quite British despite its Continental parentage.

The four Orenstein & Koppel steam locomotives (1766 and 1767 of 1905, 2342 and 2343 of 1907) are fairly conventional in appearance, but have radial outer axles to give them a much needed flexible wheel base. Coal fired, they have large headlights and capacious sandboxes. Clean rather than immaculate, they are painted in blue with white cabs and yellow lettering. Although not appearing particularly large by Indian 2ft 'main line' standards, they are powerful little machines, and have a tractive effort of 10,550 lbs. A comparison with the famous Darjeeling 'B' class, and a typical Indian 'main line' two footer is given at the end of these notes.

Time for my down train was approaching, and after a chat with the Stationmaster and driver, I found myself in the cab of diesel NDM.501 with the three man crew. The driver explained that we were to make the descent entirely by gravity, restrained only by handbrakes—this promised to be an interesting exercise, particularly as I had noticed several manned runaway sidings on the up trip. I discovered that even Matheran station yard was on a gradient, because releasing the brakes permitted the train to roll gently onto the downgrade proper. The engines ticked over in neutral for the entire descent. The locomotive brakes were operated by the two 'firemen' whilst the driver instructed the brakesmen positioned between the coaches by hand signals, occasionally supplemented by whistles when extra braking was required. Speed was kept remarkably constant, a very skilful piece of control. The view ahead from the cab was impressive, and emphasised even more the steepness of the track.

All too soon we had completed the loop section, passed Jumma Patti, and the plain was coming up to meet us. Speed increased on the long straight into Neral, was checked approaching the village, and the train rolled gently into Neral terminus, where the diesel quickly ran round and retreated to the shed yard.

The passengers dispersed into the town or onto the broad gauge station and I made my way to the shed, where I was introduced to the Superintendent and made very welcome. After a chat and a cup of tea I had a quick look round the shed, where all running repairs are carried out, though major overhauls of locomotives and stock are undertaken elsewhere. Lurking at the back of the diesel shed, blocked up at a precarious angle, was the solution to a problem that had been puzzling me—why were there turning facilities at each end of the line? They would not be needed for the steamers and diesels, and two were unnecessary for routine turning of stock. The culprit was a magnificent looking little railcar with a high upright body and long vintage bonnet—it looked as though Colonel Stephens had once passed this way! The railcar is in regular use for private hire and inspection duties, but was under repair during my visit and was sadly in an 'unphotographable' position—it should look rather splendid on film, winding round the endless curves of the line. The imminent approach of my Bombay train meant that I regretfully had to leave the shed, and after saying goodbye to the helpful staff, I caught an electric multiple unit back to Bombay, hot, tired, and dusty, glad to sit back and reflect on an excellent days trip.

To do justice to the line, particularly from the photographic point of view, I think it would be necessary to spend a couple of days at Matheran, and walk at least part of the way down the track because the best locations are away from each terminus, plus a little more time to explore Matheran itself. However, I was well satisfied with what I had accomplished in a single day, and made myself a promise to return to Matheran again someday.

Finally, I would like to thank Mr. Bernard Lopes, driver of NDM.501 and his crew, and Mr. Subramanian, Senior Locomotive Inspector at Neral Shed and his very friendly staff for their help and interest. Also Frank Jux, whose book *Indian Narrow Gauge Railways* made me aware of the line's existence, and who kindly gave me permission to quote the locomotive details from his book.

Locomotive Details:

	Matheran Class 'ML'	Darjeeling-Himalaya Class 'B'	Gwalior Class 'NH4'
Type	0-6-0T	0-4-0ST	2-8-0
Coupled Wheel Diameter	27 in	26 in	33 in
Cylinder Diam. & Stroke	11¾" x 13¾"	11" x 14"	12" x 18"
Boiler Pressure	176 psi	140 psi	200 psi
Weight	18 tons	14 tons	54 tons (including tender)
Tractive Effort at 85% boiler pressure	10,550 lb	7,750 lb	13,350 lb
Axle Load	6 tons	6¾ tons	6 tons

FLORISDORF 3012

A pictorial survey by Alan Bowler and Ron Cox

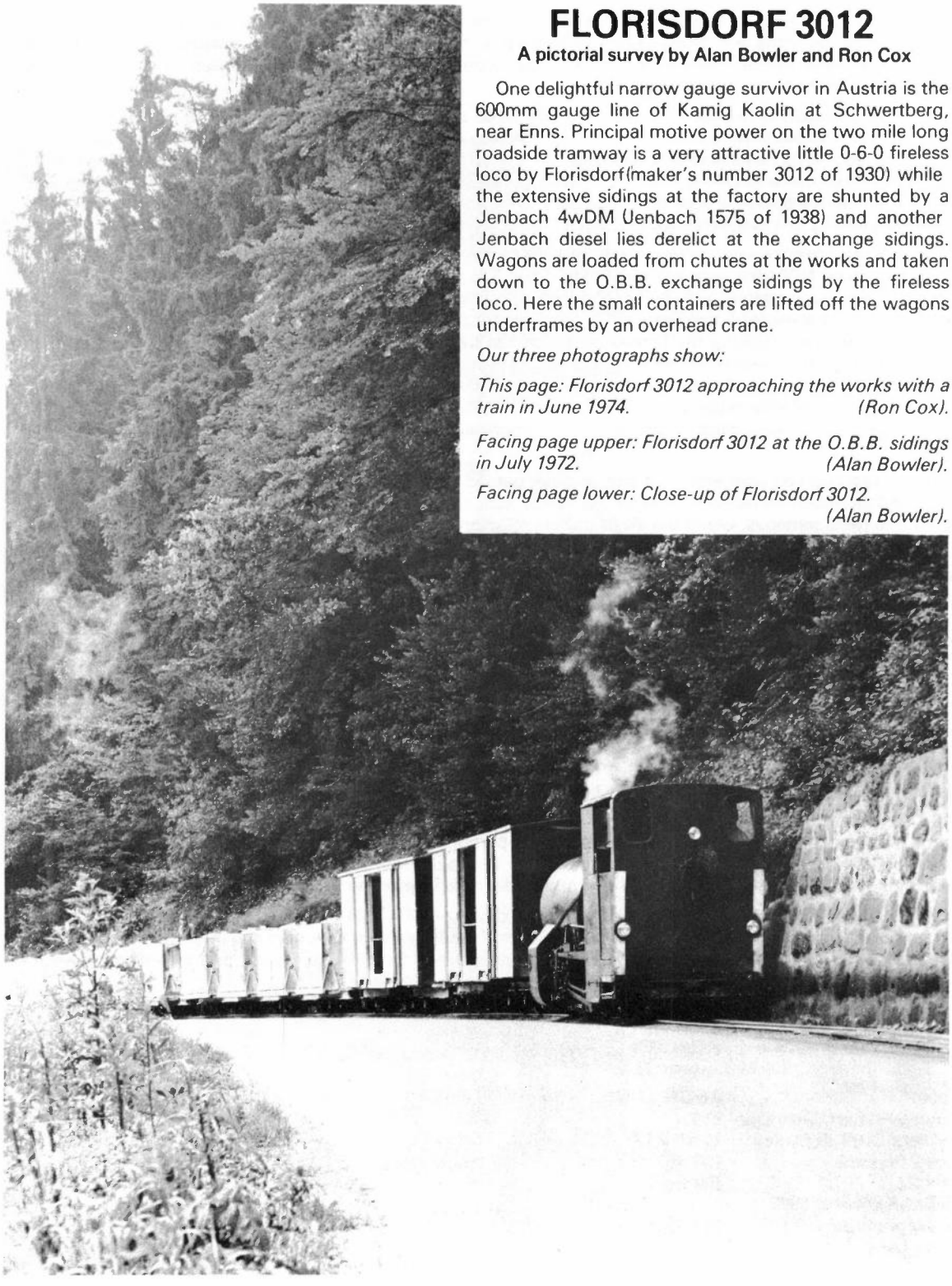
One delightful narrow gauge survivor in Austria is the 600mm gauge line of Kamig Kaolin at Schwertberg, near Enns. Principal motive power on the two mile long roadside tramway is a very attractive little 0-6-0 fireless loco by Florisdorf (maker's number 3012 of 1930) while the extensive sidings at the factory are shunted by a Jenbach 4wDM (Jenbach 1575 of 1938) and another Jenbach diesel lies derelict at the exchange sidings. Wagons are loaded from chutes at the works and taken down to the O.B.B. exchange sidings by the fireless loco. Here the small containers are lifted off the wagons underframes by an overhead crane.

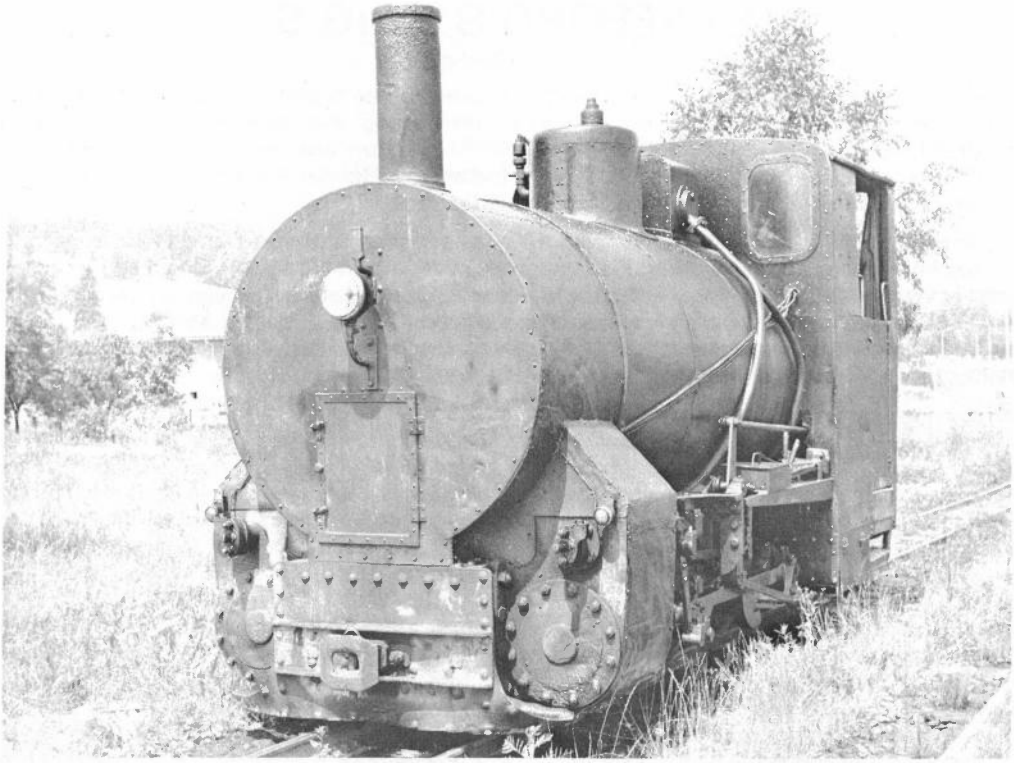
Our three photographs show:

This page: Florisdorf 3012 approaching the works with a train in June 1974. (Ron Cox).

Facing page upper: Florisdorf 3012 at the O.B.B. sidings in July 1972. (Alan Bowler).

Facing page lower: Close-up of Florisdorf 3012. (Alan Bowler).





STAFFORD'S HAIG'S

Allan C. Barker

In the annals of the British private locomotive building industry will be found many cases that defy explanation today. Often they leave present day railway historians researching this particular branch of their hobby mystified. One such mystery that could well have fallen into this category was the construction of locomotives to Kerr Stuart's well established designs by W.G. Bagnall Ltd. after the former firm's demise in 1930. Fortunately however, we have a plausible and logical explanation in this instance.

In 1882, in Hanley, one of the six towns forming the conurbation of Stoke-on-Trent, to Mr and Mrs William Edwards, was born a son, William Sydney. His father was a well known local public figure and for many years the organist at Wellington Church, Hanley. W.S.Edwards was educated at Hanley High School and in 1896 was apprenticed into the locomotive building industry at the California Works of Messrs. Kerr Stuart & Co. Here he undertook much of his training under Mr. J.W. Hartley, a celebrated North Staffordshire engineer, and Mr F.H.B. Harris, for many years Chief Draughtsman at the California Works.

By 1901 the nearby Stafford based firm of locomotive builders and railway engineers, W.G. Bagnall Ltd., were fast becoming a well known and popular builder of narrow gauge contractors and industrial type locomotives, as well as those for more important duties on the narrow gauge and light railways then expanding all over the world. This was, of course, a section of the trade very much in line with Kerr Stuarts own speciality and although at that time they were comparative newcomers to the actual locomotive building business, they had long been involved in the industry as agents. In 1892 they had expanded their business agency into the already established engineering workshops of Messrs. Hartley, Arnoux and Fanning of the California Works, Stoke-on-Trent. However, 1901 proved to be a turning point in Bagnall's fortunes for in that year their Chief Draughtsman, Ernest Edwin Baguley, decided to seek fresh pastures for his extremely active, fertile and inventive mind. Although he left the Castle Engine Works on cordial terms he had had a difference of opinion with W.G. Bagnall himself over that firm's future. Baguley wanted Bagnall to branch out into the new field of internal combustion engined traction, whilst W.G.B. considered that there was an adequate future for his firm using the well proven steam locomotive. It must be remembered that the internal combustion engine was very much in its infancy at this stage and that when the time came Bagnalls showed no lack of enterprise in adopting it as a method of powering locomotives.

Kerr Stuart official photograph of the 3'0" gauge prototype "Haig", KS 3083, for the Home grown Timber Committee, Masham, Yorks. Painted grey, it left the works on 16th October 1917, to be followed by a sister loco, 3084, on 19th November 1917.

To replace Baguley, W.S. Edwards was appointed as Chief Draughtsman of the Castle Engine Works, at the very tender age of 21 years, and they say it's a young mans world today! Over the succeeding years no man ever gave the British private locomotive building industry more than Edwards gave to Bagnalls and it was through his indefatiguable efforts, and largely his efforts alone, that the firm survived the acute depression years of the between the wars period. Bagnall's order book actually grew when the only other things so doing were the ever lengthening dole queues. During the years that followed several ex Kerr Stuart men followed Edwards to Stafford, notable amongst them were Messrs. W.R. Parkinson and Thomas Stockton, both of whom were eventually to rise to the position of Works Manager. However it was not until 1932, after Kerr Stuarts had closed their doors for the last time, that Edwards played the "Knights Move", and F.H.B. Harris was persuaded to join the firm.

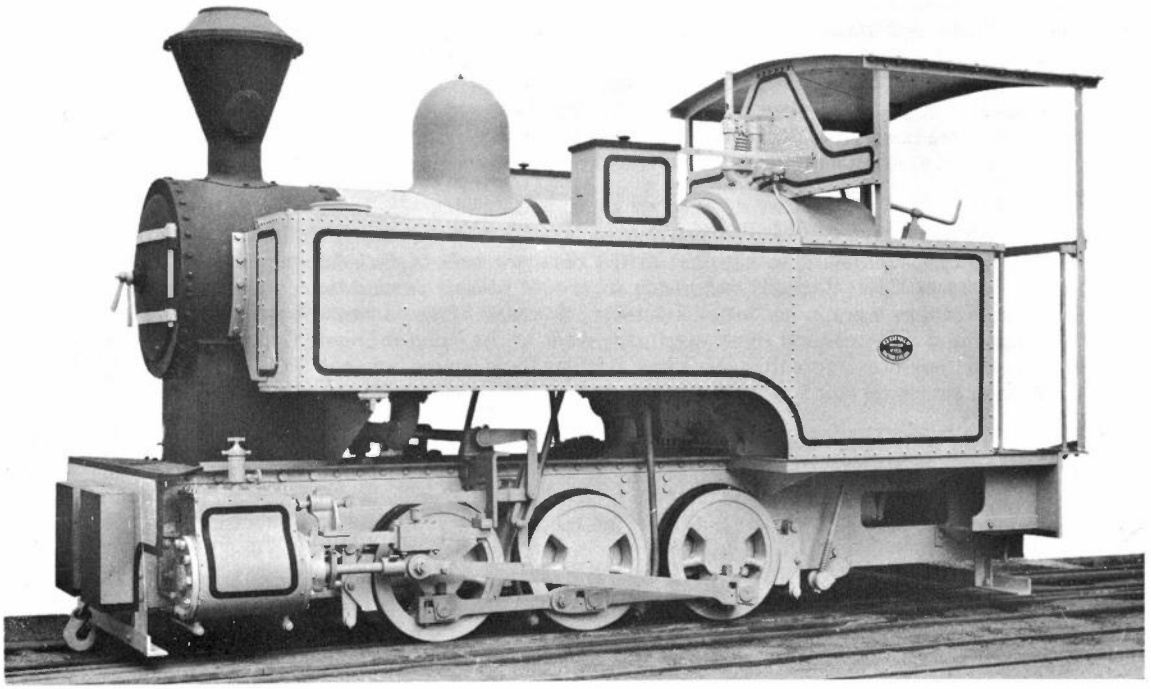
There is no need here to dwell on the unfortunate series of events that eventually culminated in Kerr Stuarts demise in August 1930. Suffice it to say that at the resultant sale of their effects, during November and December of the same year, Bagnalls were able to secure several second-hand machine tools and other equipment. However they were in no financial position, much as Edwards would have liked, to purchase the good will, designs and patterns, and these eventually went to the Hunslet Engine Co, of Leeds. Nevertheless stories still circulate that much more than just a few machine tools passed between Stoke-on-Trent and Stafford during those long cold winter nights of 1930-1.

Francis Henry Barham Harris was born in 1871 in Essex. In 1886, as an indentured apprentice, he joined the Stoke-on-Trent firm of engineers Hartley & Arnoux Bros. (later to become Hartley Arnoux & Fanning) and remained with them until they encountered financial difficulties in 1892. However he returned to the same works, by then under the control of Kerr Stuart & Co., in the following year. Around the time that Edwards went to Bagnalls as Chief Draughtsman, Harris rose to a similar position at the California Works and remained there until the very end. Harris was to become a very well known and respected personality in the British private locomotive building industry and was responsible for much of the design of almost every Kerr Stuart locomotive ever built. It therefore comes as little surprise to find the consulting engineers Rendel, Palmer & Tritton ready and waiting to enlist his services when Kerr Stuart closed in the Summer of 1930. But Edwards had different ideas and eventually persuaded him to join Bagnalls as Assistant Chief Draughtsman in late 1932. At this time H.R. Taylor was the Chief Draughtsman at the Castle Engine Works having succeeded Arthur Burley to that position in 1929. Both these gentlemen came to Stafford from the North British Locomotive Co. of Glasgow, and Burley had tragically died of sun stroke whilst on Bagnall's business in India. In October 1932 Edwards became Managing Director of Bagnalls on the death of John G. Gifford, having been previously appointed to the newly created post of General Manager in 1915. Gifford had long been connected with the firm having been a personal friend and financier of W. G. B. himself. Latterly however he had become very much a figurehead, Edwards being virtually in complete control, and indeed when Gifford died he and Edwards held the entire share holding of the firm between them. Edwards was now, even more than before, the main-spring behind anything and everything the firm did, and remained so until his untimely death, after a long period of ill health, in December 1946. Bagnalls were never the same again.

When H.R. Taylor left the firm in 1935 it was a logical and pre-planned step for Harris to take his place, what the drawings did not show he would know! It was very shortly before Harris arrived at Stafford that Bagnalls began to discreetly make it known in various circles that they were in a position, prepared and indeed equipped, to build locomotives to former Kerr Stuart designs, and supply spares for those already built. Of course this was much to the annoyance of the Hunslet Engine Co., who themselves had gone to considerable trouble and expense to secure the Kerr Stuart good-will. Nevertheless over the next few years Bagnalls did supply large quantities of replacement parts, including complete boilers, for Kerr Stuart locomotives all over the world. They also secured several orders from what could be called Kerr Stuart's old and regular customers, and in many cases these were to designs quite obviously strongly based on previous California Works practice. The famous Indian Gwalior Light Railway 2ft. gauge pacifics (WGB No's 2453-60 of 1932) being, perhaps, one of the most well known. Of course with Harris part of, and later head of, the design team a certain Kerr Stuart lineage quite understandably found its way into numerous other Castle Engine Works designs.

However, perhaps the most interesting events of all were the building of exact copies of thoroughbred Kerr Stuart designs, and for old established California Works customers. Of these the "Moss Bay" 15in. cylinder 0-4-0 saddle tank, and the "Haig" class narrow gauge 0-6-0 side tank, are undoubtably the most familiar. In this article we are only concerned with the latter, of which four were built by Bagnall between 1939 and 1947.

W. G. BAGNALL LTD., CASTLE ENGINE WORKS, STAFFORD

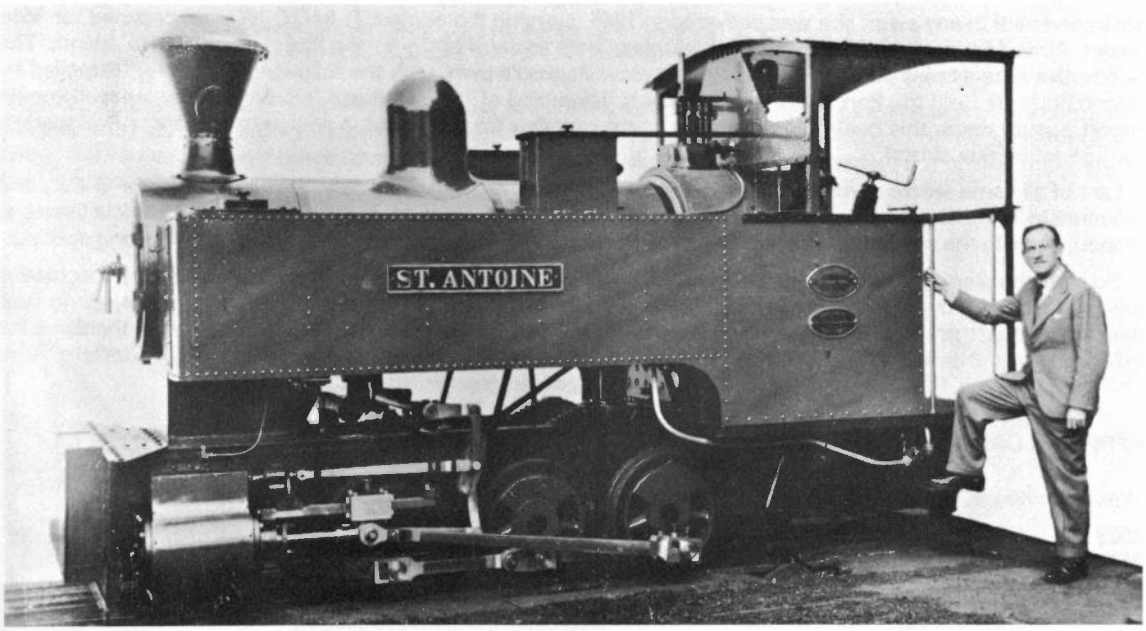


Works official photograph of WB 2675/42. Note slightly shortened sidetanks, displacement lubricators and Bagnall-Price valve gear. (A.C. Baker/T.D.A. Civil collection).

Possibly more than any other British builder Kerr Stuart made a speciality of building locomotives to a series of standard designs, all builders did this to some extent, but nobody went to the extremes that they did at the California Works. These locomotives were often built to stock, with no particular customer in mind, contrary to normal practice where locomotives were only built against specific orders. Most builders did, of course, occasionally lay down locomotives for stock when trade was low, usually they were not actually finished until a firm order came in, as gauges and other details could require alteration against a buyers instructions. However nobody seemed to have done so to the extent that Kerr Stuart did, it being standard practice at the California works to build both to set designs and to stock. Nevertheless they were not beyond turning their hands to any specification that a customer might request, and many are the one-off designs that have emerged from Kerr Stuart when required.

One such standard design was known as the "Haig", which was probably derived from a previous class known as the "Joffre".

The original "Joffre's" were built during 1915-16 for use on the French Government Artillery Railways 600mm gauge lines behind the trenches. One hundred of them were ordered when Decauville were unable to supply enough of their standard 0-6-0 side tank design in time, the Kerr Stuart locos being closely based on the Decauville design. The Haig was a narrow gauge (between approximately 2'0" and 3'0") 0-6-0 inside frame, outside cylinder, side tank of conventional British design and construction. Cylinders were originally 8½" × 11" with a wheel diameter of 1'11.5/8", valves being outside and actuated by Walschaerts valve gear. The first members of this class were built by Kerr Stuart in 1917 and thereafter a large number were constructed, the class becoming particularly popular on the sugar estate lines of Mauritius. Indeed between 1920 and 1922 no less than 9 such locomotives of gauges varying between 60cm and 80cm were exported to that island for sugar plantation use. This industry was no new-comer to Kerr Stuart, or for that matter Bagnalls, both builders having sent many of their products, both locomotives and rolling stock, to that country during the first 20 odd years of the present century. Consequently it will come as no surprise to find an order being placed with Bagnall for a "HAIG" type locomotive.



WB 2807 differed from the prototype Bagnall "Haig" in having full length side tanks and a different lubricator arrangement. (A.C. Baker/T.D.A. Civil collection).

The order, placed on 20th December 1938, came from an old Bagnall customer and Mauritius agent, L. Mitchell & Co. Ltd. of 17, Philpot Lane, London, E.C. 3. The locomotive, given works number 2603, was built to 2'5½" gauge and differed little from its Kerr Stuart prototypes. The most noticeable differences were the removal of the safety valves from dome top to firebox, re-arrangement of the smokebox saddle and substitution of a Bagnall pattern smokebox door. The spring gear was also altered and Walschaerts valve gear replaced by Bagnall-Price. Bagnalls always favoured the use of their own patent valve gears and Bagnall-Price invariably took the place of Walschaerts on small narrow gauge locomotives such as this. It had been designed and patented, jointly by W.G. Bagnall and his Works Manager S.T. Price, in 1903 and not much used since. Unfortunately it is not known exactly where this locomotive went but in later years she was with Mon Desert Alma Ltd. at their estates near St. Pierre in the centre of the island, carrying the name BRETON. Although still in existence until quite recently, she has been out of use since 1959 with a condemned boiler.

The second Haig, identical to the first one except for the gauge which was 2'7½", was ordered from Bagnalls on 26th February, 1942 by Frank Ross & Co., export merchants of 9-11 Fenchurch Avenue, London, E.C.3. Delivered from Stafford on 15th September, 1943, she cost £1850 and carried the works number 2675. Again, unfortunately, it is not known to which estate she was delivered.

The remaining two Bagnall Haigs differed somewhat from the previous two. The hydrostatic cylinder lubricators were replaced by a Dunbar & Slater 2 feed mechanical type mounted in the cab on the left hand side and driven from the expansion link. Friedman hot water injectors, mounted under the footplate, replaced the backhead mounted combination type used on the original two, and brass tubes were used instead of steel. However by far the most noticeable feature was the extension of the water tanks and consequent larger capacity, some 20 gallons being obtained by an increase of 8" in tank length. This brought the tanks almost, but not quite, in line with the smokebox front. All the engines had hand brakes and gravity sanding, the latter from a sandbox mounted on the tank tops and feeding both the front and rear of the intermediate coupled wheels. A large spark arrester completed the picture.

The first of these two, works number 2872, was ordered on 29th November 1944 for 2' 5½" gauge, by A. Gloster & Co:, Imperial House, South Street, London, E.C.2. Before the war Adolph Gloster was the British agent for Orenstein & Koppel, and during the War the business was run by his British wife, Gloster himself being in exile in the Isle of Man. The firm later became Railway, Mine & Plantation Equipment Ltd. and still hold German agencies in this country today. One wonders if this order would have come Bagnall's way if the war had

not intervened! In any event she was delivered in 1946, carrying the name ST. ANTOINE, and destined for Mon Desert Alma Ltd, for their Saint Antoine estates, near Poudre d'Or, in the north east of the Island. The locomotive bore a brass plate on its cab sides, below Bagnall's own, with the following legend:— "Supplied by Ireland Frazer & Co. Ltd., Port Louis". Port Louis is the capital of the Island and Ireland Frazer were well known import agents there, this being a case of one agent ordering from another, a sequence of events designed to confuse later enthusiasts!

Last of all came works number 2894, 2' 5½" gauge again, ordered 2nd July 1946 by A. Gloster & Co., and delivered in 1947. This one was presumably destined for Harel Freres Ltd. for their Belle Vue-Mauricia Estate at Mapou, again in the north of the island. She carried the name BELLE VIEW, despite its apparent wrong spelling.

So ends the story of this interesting class of locomotives, and indeed an interesting slice of British locomotive building history. However it would seem almost certain that some, at least, of these locomotives, along with their Kerr Stuart predessors, still exist. In conclusion I should like to take the opportunity of thanking the following for their help and assistance in the writing of this article. My co-author in *Bagnall's of Stafford,* Allen Civil, Jeff Lanham, F.H. Wood and G.E.C. Traction Ltd., as successors to W.G. Bagnall Ltd.

APPENDIX ONE: Summary

Works Number	*Date Ordered*	*Date Delivered*	*Gauge*	*Name*
2603	20/12/1938	1939	2'5½"	(later named BRETON)
2675	26/ 2/1942	15/9/1943	2'7½"	—
2827	29/11/1944	1946	2'5½"	ST. ANTOINE
2894	2/ 7/1946	1947	2'5½"	BELLE VIEW

APPENDIX TWO: Main Dimensions

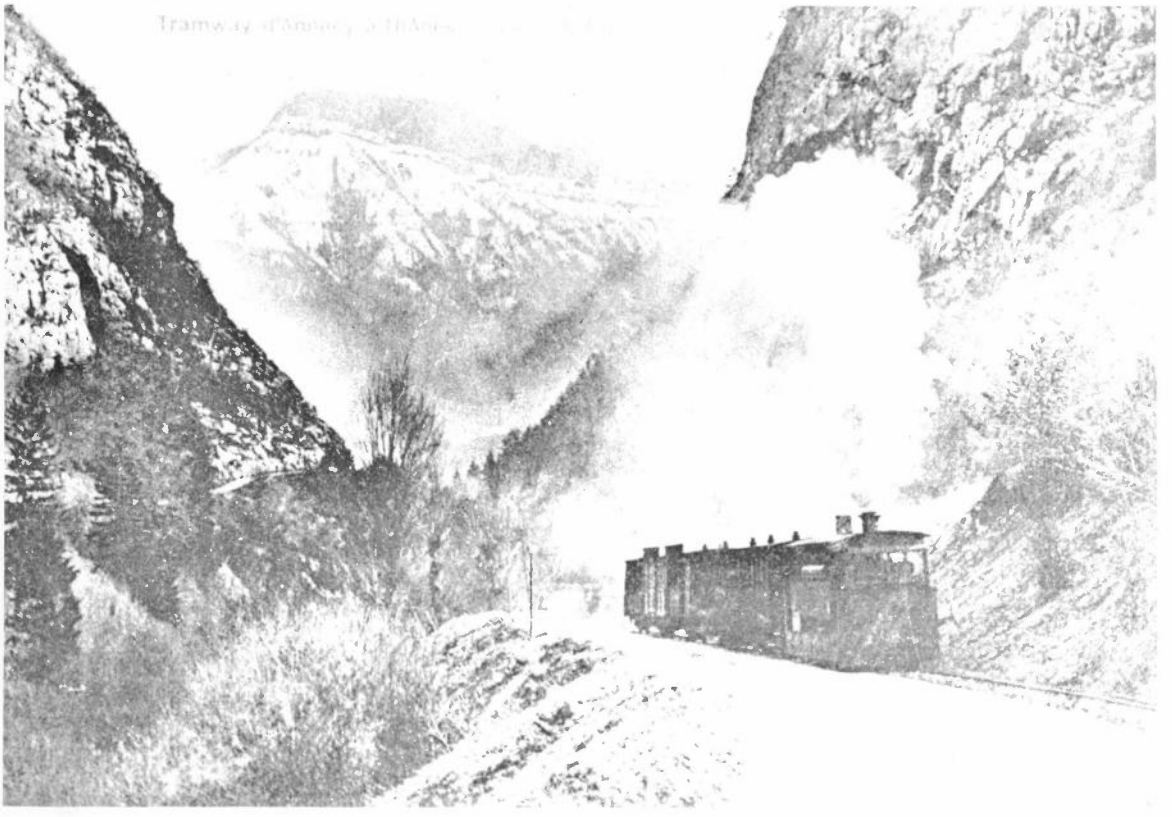
	WGB 2603/75	*WGB 2827/94*	*KS HAIG*
Cylinders	8¼"x 12"	8¼"x 12"	8½"x 11"
Driving Wheel Diam.	1'11⅝"	1'11⅝"	1'11⅝"
Wheelbase	4'7⅛"	4'7⅛"	4'7⅛"
Water Capacity	250 galls	270 galls	264 galls
Fuel Capacity	22½ cub ft	22½ cub ft	22 cub ft
Heating Surface(tubes)	174 sq ft	174 sq ft	168-5 sq ft
Heating Surface(firebox)	26 sq ft	26 sq ft	23.25 sq ft
Heating Surface Total	200 sq ft	200 sq ft	191.75 sq ft
Grate Area	5.5 sq ft	5.5 sq ft	4 sq ft
Working pressure	176 psi	176 psi	160 psi
Weight in Working Order	10½ tons	11 tons	10½ tons
Weight empty	8½ tons	8.75 tons	8.3 tons
Tractive Effort at 85% Working pressure	5172 lb	5172 lb	4790 lb
Boiler feed	2 x No 4 m/m injectors for all types		
Tubes	Steel 62 x 1¾" o.d.	Brass 62x1¾" o.d.	62x1¾" o.d.
Firebox	Copper	Copper	
Rail level to centre of boiler	5'0"	5'0"	5'0½"
Overall width	6.1¾"	6.1¾"	6'2¾"
Overall height	8'8⅝"	8'8⅝"	8'11"
Overall length over frame plates	14'1"	14'1"	13'7⅝"

Notes:— The Kerr Stuart dimensions are taken from their drawing No. 27204, which claims to show their Nos. 3083-4, 3'0" gauge HAIG type. These were the first of the class and were supplied in 1917 to the Home Grown Timber Committee, Canadian Forestry Corps.

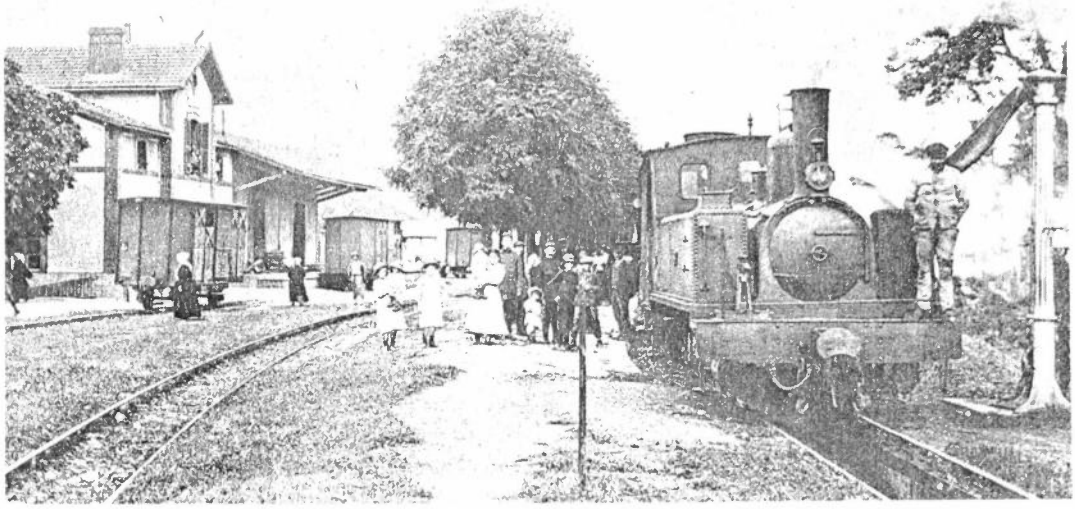
The official Bagnall weight book gives the weight in working order for No. 2675 as 10.75 tons.

GEORGE GUNDRY'S COLLECTION

We are indebted to George Gundry for making available a selection from his large collection of photographs and postcards of French light railway scenes for publication in this magazine. The first part of this series appears below. Additional historical notes have been provided by D.A. Bayliss and P.R. Lemmey, but further information from readers will be welcome.



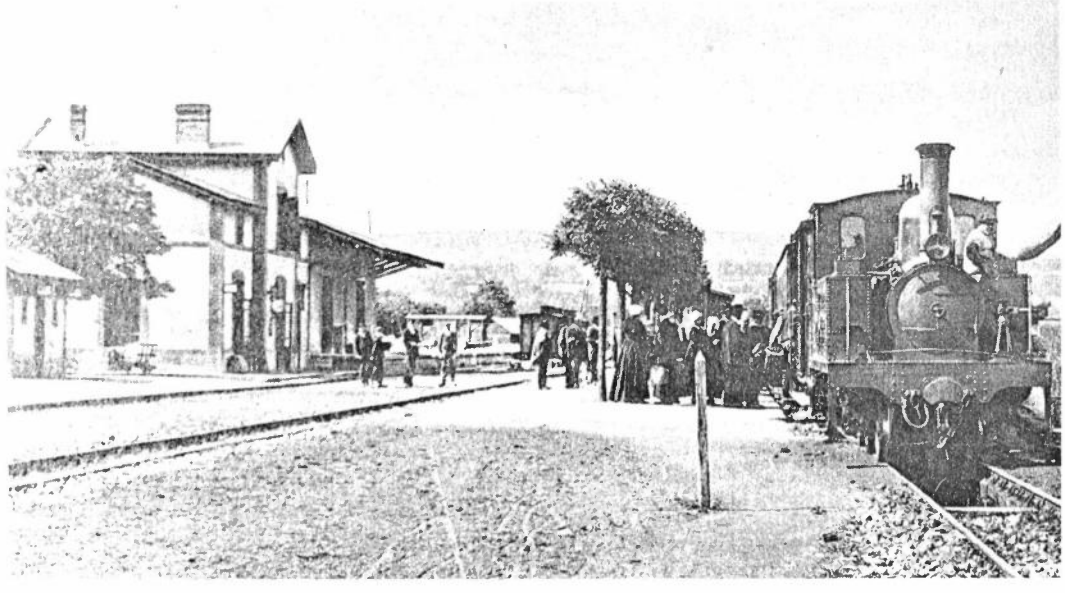
TRAMWAY D'ANNECY A THONES. The roadside steam tramway was to be found even amid the mountain scenery of the French Alps, as here on the metre gauge line which ran the 14 miles from Annecy to the mountain resort of Thones. Starting at the Gare de Tramway near Annecy P.L.M. station, its route lay first through the streets of the town, out round the northern end of the famous lake, and then away up the R. Fier valley through the Aravis massif past the village of Dingy to Thones itself. The 1½-hour journey was popular with holiday-makers — it gets a mention in Christopher Isherwood's autobiography "Lions & Shadows" — and at one time the line must have been quite prosperous. The reason for its eventual undoing was no doubt the road beside which it ran, and along which by the early 1930s the P.L.M. motorcoaches were running the replacement service. We have been unable to establish the exact opening and closing dates of the T.A.T. and the builders of its tram locomotives — one of which is seen here with an Annecy train near the halfway point of the line, with the summit of the Parmelan (6020 ft) in the background. Perhaps our readers can supply some more details.

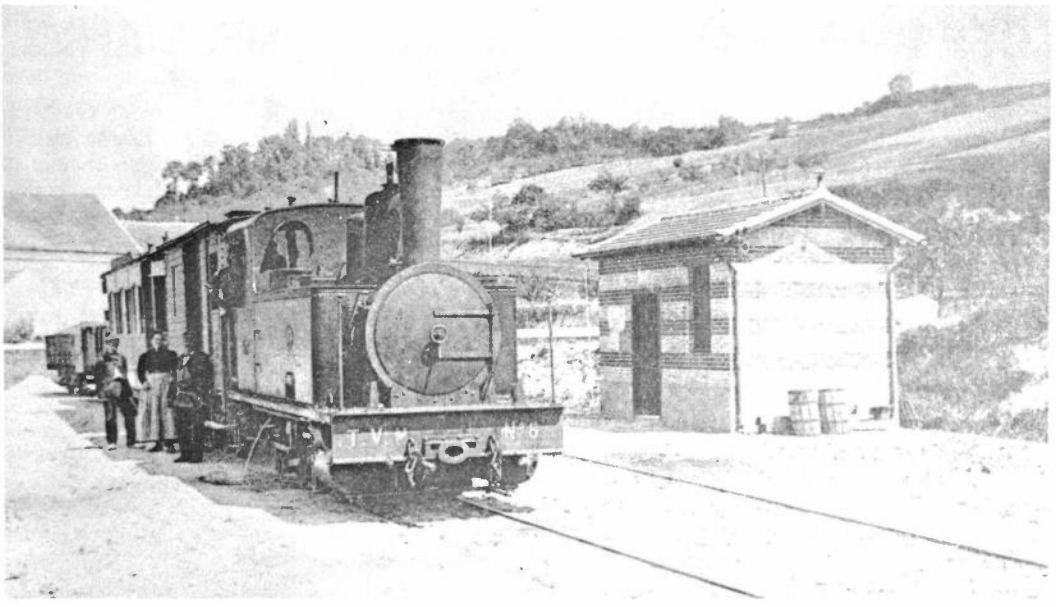


RESEAU BRETON. This state owned, but C.F. Economiques operated system closed its narrow gauge services in 1967. The upper view shows Pontrieux Station, probably before 1914, since the Paimpol line was mixed metre and standard gauge between 1924 and 1953. The loco is one of the S.A.C.M. 0-6-2T's which with other small locos operated the services until the advent of the 4-6-0T's and Piguet Mallets. It is said that when the third rail was laid, the crews starting from each end of the line added it to opposite sides of the metric track with somewhat embarrassing results when they met half-way!

In the lower view S.A.C.M. 2-4-0T is at Gourin, between Carhaix and Rosporden, where there was a junction with the Morbihan lines, which had a station nearby. Somewhat reminiscent of the Southwold Sharp Stewart locos, several lingered on in sidings until the 1950's. The photograph probably dates from early this century.

The similarity between the two stations, built in 1894 and 1896 and some 50 miles apart, is most noticeable even to the trees.





TRAMWAY DE VERSAILLES A MEULAN. A typical metre gauge roadside line operating in then rural parts of the Ile-de-France, west of Paris, it had a short and penurious life and was operated by Corpet Louvet and Pinguely 0-6-0T's.

Opened in 1899 from Versailles north west to Crespieres and Maule, it was extended via Nezel, Flins and Bouafle to Meulan in 1909, Bouafle to Meulan being mixed gauge, shared with the C.F. de Grand Banlieue line from St. Germain. Serving villages on the edge of the Foret des Alluets its dubious services created a financial crisis in 1911, so the Banlieue took over and standard gauged the line in 1912-13. Closed with the C.F.G.B. from 1916-23, it was operated by the S.T.C.R.P. 1923-33 and the C.F. Economiques from 1933 until closure in 1946.

The pictures show T.V.M. No. 8, a Corpet Louvet 0-6-0T, at Nezel (above) and Flins (below), immediately prior to the 1914-18 War. Flins is now the site of a Renault factory. Note that the stations have the frequently found layered brick-work.

OFF THE BEATEN TRACK IN EAST GERMANY

Martin Murray

The public narrow gauge lines of East Germany are well known to enthusiasts, and were described in an article by Andrew Neale in Narrow Gauge No. 71. However, I have a rather perverse disinclination to visit lines where other enthusiasts have been before, and so, when I found myself with a day to spare in Dresden in June 1975, I decided to look for something different. Helmut Pochadt, my East German travelling companion, mentioned a stone quarry near Kamenz which was supposed to have working steam locos, so off we went in the car in that direction. Arriving at the village of Bernburg in mid-morning, we drove round in circles for a while, passing under one or two disused railway bridges, until we eventually found some disused 600mm gauge track, then some shiny rails near the quarry entrance. Then a diesel loco appeared, hauling a few skips, but first we had to contact the authorities to obtain permission to enter the quarry. This unfortunately coincided with the lunch break, so we waited around until the foreman appeared. He was most friendly, and proceeded to take us to the small engine shed.

Inside the small two-road shed were two steam locos, both by Krauss, and identical apart from the cab windows. Both were undergoing repairs, but the staff were uncertain if they were ever going to run again. The third loco however was working, and a few minutes later it came up the bank from the quarry with a train of skips, which it then reversed into the loading bay to the standard gauge connection. It was more modern than the two Krauss locos, built by Jung in 1938, but mechanically almost identical. Indeed, the German 600mm gauge 0-4-0WT, of which literally thousands were built, and of which these three must be amongst the last survivors in industrial service, changed little in design from about 1900 onwards.

As we watched this fine little engine going about its work, we got into conversation with other workers, and one of them took us into an office at the back of the shed, where on the wall was a beautiful old photo, taken about the time the railway at the quarry was opened, around 1904. Reproduced here, it shows work on track laying in progress, and a brand new Orenstein & Koppel 0-4-0WT, with the works number, 1366, clearly legible on the works plate. Back home, I could trace this loco in my O & K list as having been delivered to C. Halback of Kamenz; also I found in my records that it was bought by the Austro-Hungarian Army in the First World War, numbered 845, and last reported by the Austrians as being in Obilicevo in Macedonia.

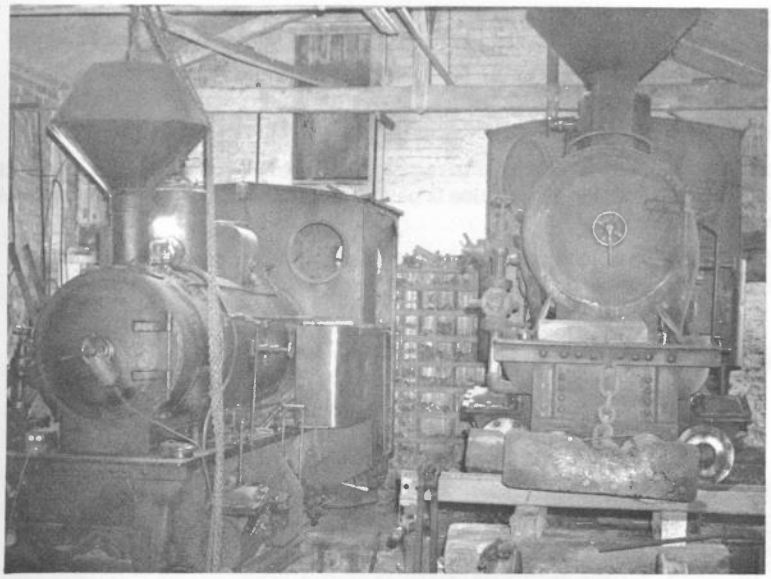
Conversation with the workers revealed that up to 1945 the quarry had indeed been owned by the Halback family, who were closely related to the Krupps, and we also discovered that this was the 'Quarry near Leipzig' where the locos from Goering's private miniature railway were stored during the war. Perhaps one of our miniature railway experts can give us more information on this latter topic.

Jung 8293 brings a train of skips up from the quarry. *(Martin Murray)*

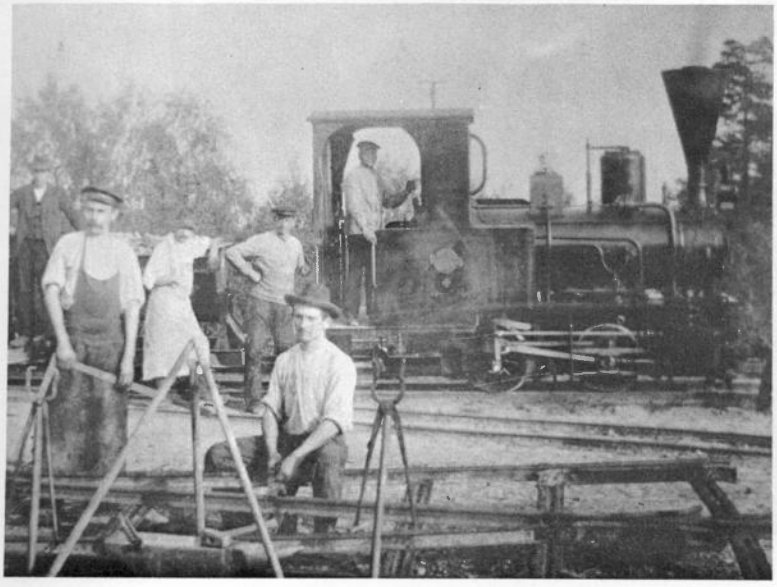
Unfortunately, the quarry was due for modernisation at the end of 1975, and the workers were expecting that this would mean the end of the narrow gauge railway and the steam locomotives. I have not had confirmation whether this actually happened, but at least we had been fortunate to see this relic of earlier days working as it had done for over 70 years. Maybe it was not as impressive an operation as some of the Deutsche Reichsbahn's narrow gauge lines, but for me it had the irresistible attraction of being a new discovery.

Locomotive details:—

0-4-0WT	Krauss	7789/23	New to E. Brangsch, Leipzig, for M. Heine, Dessau
0-4-0WT	Krauss	7790/25	New to E. Brangsch, Leipzig, for M. Heine, Dessau
0-4-0WT	Jung	8293/38	New to E. Brangsch, Leipzig
4wDM	Gmeinder	/38	



The two Krauss locos under repair in the locomotive shed. (Martin Murray).



Vintage gem. OK 1366 and crew pose during track laying work c/1904. (Copy print Martin Murray)

TWO INTERESTING MODELS

R. C. Link

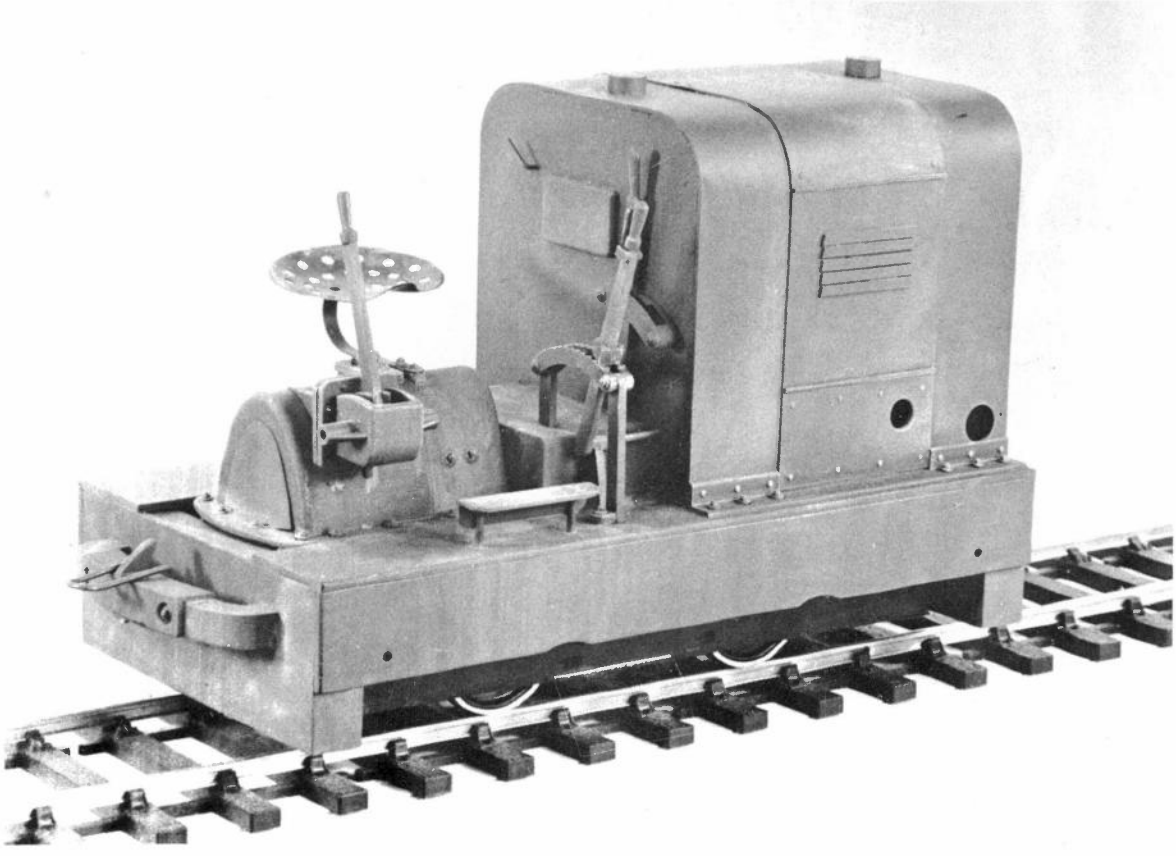
RUSTON 10/13 H.P. CLASS LOCO

Just prior to World War II Ruston & Hornsby built five 10/13 H.P. Class four wheeled diesel locomotives. Weighing 2¼ tons, they were fitted with Ruston 1VSO engines and were the only single cylindered locomotives ever built by Ruston's. One of them, 2ft gauge RH 198226/39, was exhibited at the Lincolnshire Show and the Royal Show at Windsor during June 1939, being described as 'suitable for light railways on farms and plantations' but despite this publicity the class was soon superceded by the twin cylinder 13DL class of which over 100 were built up to 1952. The "wrap around" bonnet (very similar to that of RH 163997, the pioneer diesel locomotive) gives these locomotives a very distinct appearence compared with the more angular lines of the conventional Ruston diesel.

Although shown on a chassis (actually a Lima four wheel diesel) this model was a "body only" project. A friend wanted a small diesel for a proposed 1" to the foot scale layout. I made the body out of Plasticard sheet, only the driver's seat and bracket being made out of nickel silver for strength. The various nut and bolt heads with which most Ruston products are studded were represented with Grant Line styrene castings. Fabrication of the gear box detail took nearly as long as the rest of the body.

Research has shown that it would be difficult (if not impossible) to regauge a Ruston to run on 15in gauge track which is what my friend intends to do. This is to enable him to use 0 gauge motor units, track and rollingstock wheels for a modern Heywood style estate railway.

(In real life regauging a Ruston to 15in gauge track **is** *impossible as the Ravenglass to Eskdale Railway found when they attempted to regauge the 18in gauge New Brighton loco (originally a 60cm gauge standard 20DL loco) to 15in gauge in 1966—AN.)*



BAGNALL INSIDE CYLINDER WING TANK

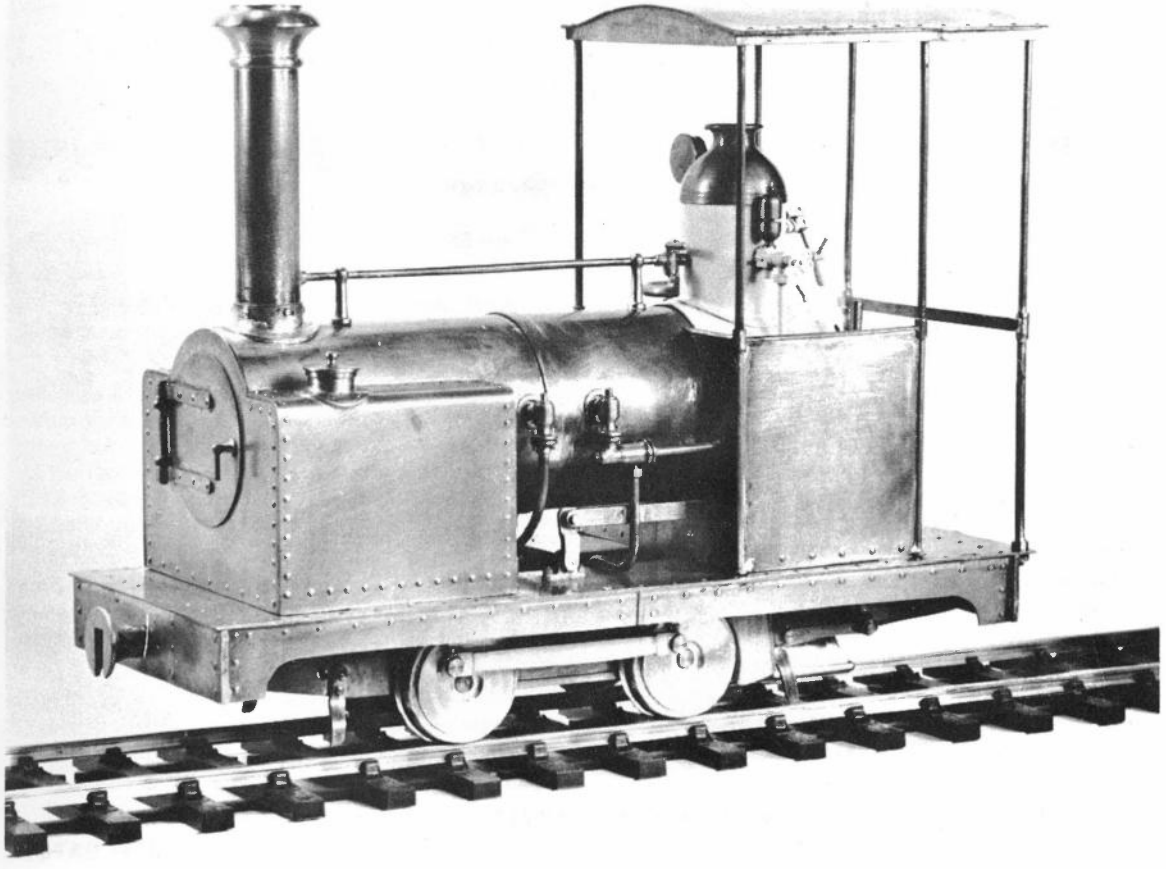
In 1880, *The Engineer* published an article describing three small Bagnall tank locomotives. An accompanying engraving illustrated one of these engines in both section and three quarter view. The locomotive modelled had, in reality 4½" cylinders with 7½" stroke, 15" dia. wheels and a wheel base of 2'9". Interesting features on the original were a spark arresting chimney "with two lids, one either side for cleaning out," and an ash pan "which is made to contain water, a cock from the tank is fitted to refill it when necessary". These were fitted for plantation service and "dried canes" are mentioned as fuel.

W.G. Bagnall stated that the engine "can easily take up 12 tons gross load on gradients from 3 to 4 per cent; extending 400 yards, and we find no difficulty keeping steam up"!

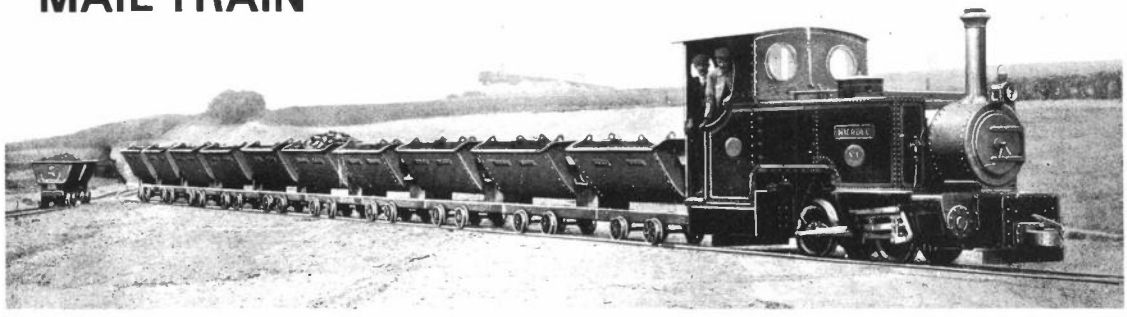
The model has been made up of brass sheet and bar, with steel axles, dural wheels and nickel silver side rods. As the locomotive is intended for an English style layout the spark arrestor has been replaced with a plain Bagnall chimney of the period.

Constructed to a scale of 16mm to one foot, the model runs on 32mm gauge track (0 gauge). The motor is a Kemtron 5 pole "stack" type and drives through a 38-1 gear box of similar manufacture, these being the only purchased parts. Current pick up is by the two rail system and allowance has been made for the fitting of a sound system later on.

I am indebted to Allan C. Baker without whose knowledge of W.G. Bagnall and their products this model would as yet be unmade.



MAIL TRAIN



TURKISH DELIGHT

With regard to the article in NARROW GAUGE 75 I can give some details of other E.K.I. narrow gauge locos. Whitcombe built thirtyfive 600mm gauge 4wDM, carrying running nos. 101-135. The first fifteen were built in January 1947, works nos. 40386-40400, class 7DM-6b, 35 H.P. weighing 7U.S. tons. The next ten, works nos. 40640-40649, were similar locos of class 7DM-6c built in March 1949 and the last ten, works nos. 40679-40688, were built in April 1950.

DONIPHAN, U.S.A. **H.L. GOLDSMITH**

During a visit on 2nd May, 1977 to the various EKI sites in the Zonguldak area two more of the batch of ten 60cm gauge Bagnall 0-4-0ST's were found at Koslu Colliery. One locomotive bearing a plate No. 1 is preserved on a length of track alongside one of the roadways in the colliery. The motion is stamped 2866 but it carries in error a worksplate from Bagnall 2846/46, one of the metre gauge 0-6-0PT's supplied to the Eti Steel Co. The other locomotive is dumped on the ground in a yard about ¾ mile north of the colliery. It is virtually complete but plateless and the motion is stamped 2861.

WALLASEY, MERSEYSIDE. **JOHN BATES**

OVERSEAS PRESERVATION

Congratulations on your success with the difficult prints of the Dick, Kerr. They have come out remarkably well. Only one mistake; it should be Dhilwan, not Dilwah.

I see that the hybrid at Siliguri has put in an appearance! I have been trying to establish the history of this engine for many years, and, with the usual invaluable help of Hugh Hughes, offer the following additional notes which may be of interest to your readers.

BABY SIVOK (the name given to the engine when 'rebuilt' at Tindharia for the 1953 exhibition) carries a boiler plate bearing the date 1888. If this is correct (and it is more likely to be authentic than some of the other plates and descriptions appended from time to time), the engine was built before Orenstein & Koppel started under that name. O. & K. No 1 opens their list in 1892. It seems likely that this engine was one of the engines built by Krauss for Arthur Koppel and the list shows that two 0-4-0 tank engines (Krauss 1628 and 1997, both of 1888) were supplied to Arthur Koppel as agents. Details of the engine certainly bear the stamp of Arthur Koppel's design.

When the engine was transferred to the D.H.R. (by Gillanders, who were at that time agents for the Raipur Forest Tramway as well as the D.H.R.) it was probably for use as a construction engine on the Teesta Valley Branch. This was relatively level and the engine could have done some useful work in this capacity. It is almost inconceivable that so small a machine could have been capable of any useful work on the heavily graded sections of the D.H.R.

It is my guess that the collar tank and the D.H.R.-style coal bunker were added to support the official legend at the Delhi Exhibition that this is the oldest locomotive from the D.H.R.! Even the coupling arrangement is totally incompatible with D.H.R. practice.

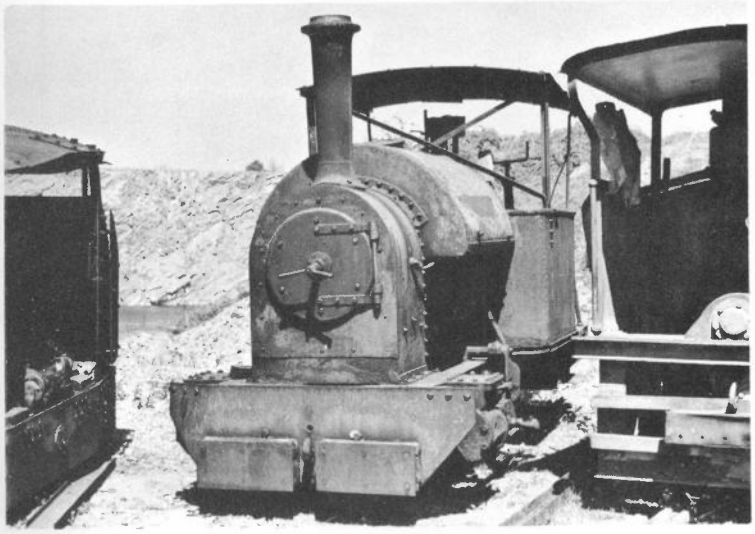
Whatever it is, it's a good 'conversation piece' and it's nice to have it there!

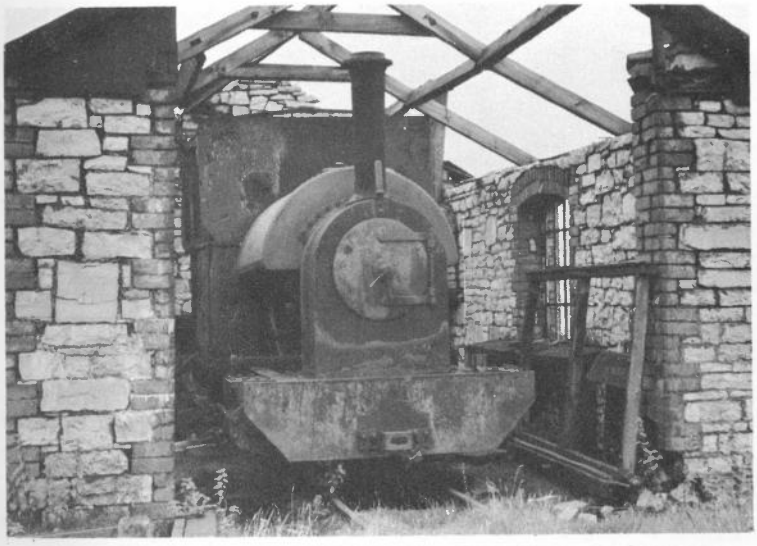
ORMESBY, TEESIDE **MICHAEL SATOW**

DARTMOOR TATTOO

In his article on the Redlake Tramway in NG75, Mr. Wade states that the majority of Kerr Stuart "Tattoos" built to such narrow gauges as 2ft 3in had outside frames. This is surely not correct? 2ft locomotives of this type may have had outside frames, but Kerr Stuart rarely used outside frames if they could use the somewhat simpler and more rigid inside frame layout and on the Tattoo design this was certainly possible once the gauge reached 2ft 3in. The most famous Tattoo of all—SIR HAYDN of the 2ft 3in gauge Talyllyn Railway—has inside frames, and if my memory serves me right the locomotive at Penwyllt mentioned by Mr. Wade also had inside frames.

The Penwyllt line was the first narrow gauge railway that I ever remember seeing, in the latter days of the last War. It was derelict then, having closed at the outbreak of War, but was still complete when I first visited it. Its purpose was to bring silica sand from the quarry at Pwll Byfre down to the brickworks at Penwyllt station and was in two distinct parts. A rope-worked incline climbed out of the works itself to a small yard on the hillside overlooking the former Neath & Brecon Railway station; this incline was not straight and therefore featured some elegantly tapered vertical rollers on the curved section. The incline had an electric winder in a corrugated iron shed at the top yard. Alongside was the locomotive shed which belonged to the same school of architecture and still housed GWENDOLEN. From this little yard a single line ran out across the moors to the quarry about a mile away, the hillside being, I have since discovered, the site of more than one early railway built many years before the one that I remember. I last saw the line in 1947, when the hillside and buildings were littered with the skeletons of sheep that had perished in the extrememly hard winter of that year. I heard later that the line was scrapped in 1950 or 1951 but was told that when the locomotive was being scrapped some parts were purchased by the Talyllyn Railway as spares for SIR HAYDN. Perhaps one of our TR-oriented readers could confirm or deny this.





Upper: KS 856/04 amongst the dump of narrow gauge locos at Roads Reconstruction, Cranmore Depot, Somerset.
Lower: KS 859/04 abandoned in the shed at Penwyllt.
(Both F. Jones).

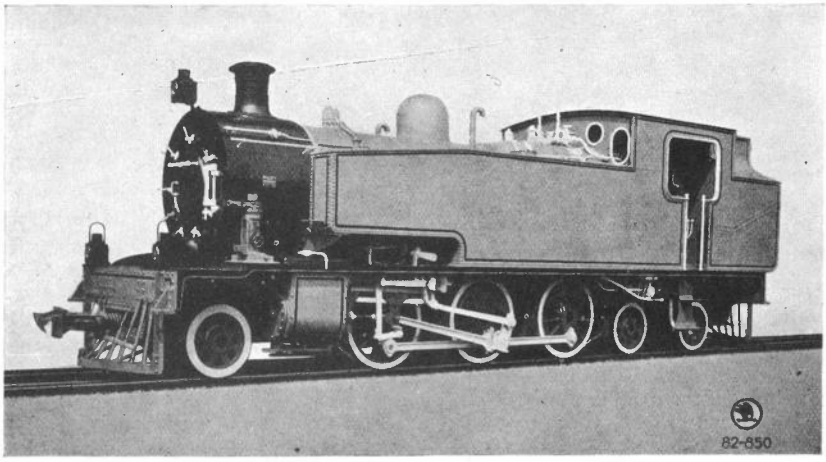
The Penwyllt line must be even less well documented than the Redlake Tramway, and if traffic on the latter scarcely justified two locomotives the traffic on the former can hardly have justified one—or at least one as big as a Tattoo.

RODNEY WEAVER

KENILWORTH, WARWICKS

ŠKODA WORKS

PRAGUE **CZECHOSLOVAKIA**



One of the five 2-6-4 Tank Locomotives delivered to the Burma Railways.

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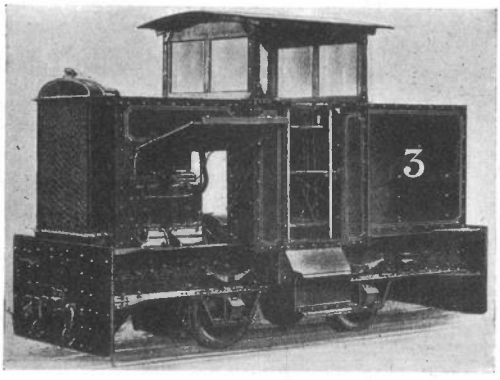
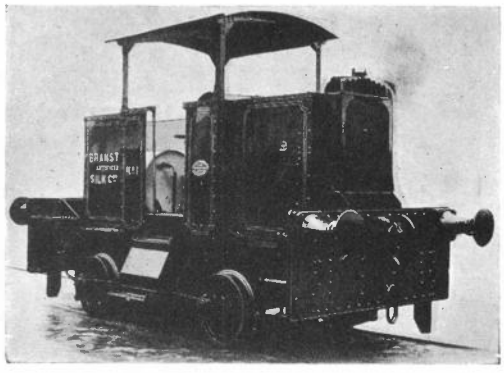


NARROW GAUGE CHAIN DRIVEN LOCOMOTIVE



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