Construction of the Prieska–Kalkfontein railway line 1914–15

Part 1: A running start – from Prieska to Upington

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One hundred years ago South Africa, as part of the British Empire, was at war with Germany. The first objective of the Union Defence Force was to take control of German South-West Africa (GSWA, today Namibia). A part of this offensive was to bridge the gap between the two national railway systems, from Prieska in South Africa to Kalkfontein (today Karasburg) in GSWA. This was a daunting challenge delegated to a newly formed South African Railways (SAR) and was executed successfully under trying conditions. This article (part one of three) describes the construction of the railway line from Prieska to Upington.

SOUTH AFRICA ENTERS WORLD WAR ONE

Britain declared war on Germany on Tuesday 4 August 1914. On Friday 7 August South Africa received a request from the British government to capture and inactivate a network of wireless stations in Windhoek, Lüderitz and Swakopmund – powerful transmitters that relayed communications between Germany, its colonies and its naval fleet in the southern Atlantic Ocean. By Monday 10 August, after "considerable deliberation by a much divided cabinet", South Africa acquiesced. Although official ratification only followed during a special meeting of Parliament between 9 and 12 September, war preparations started immediately.

South Africa could muster an overwhelming number of troops, but logistical challenges had to be overcome first. GSWA was relatively inaccessible, being effectively surrounded in the east by the Kalahari Desert, in the south by the arid, barren Namaqualand, in the west by the Namib Desert and the inhospitable Atlantic coast. World War One came at a time when movement of troops and war material was largely dependent on either animal power or rail. The large distances, lack of water, heavy sand, extreme heat and an almost complete absence of proper roads worked heavily against using animal power for logistical support (although it continued to play a decisive role in the offensive movements of troops). Rail was the obvious answer, but there was no connection between the rail systems of South Africa and GSWA. It was therefore a matter of urgency to link the two networks – until then, the only alternative was to bring supplies either by ship to Lüderitz or Swakopmund, or by ox-wagon across the arid wasteland of the Kalahari Desert. When General Smuts (then Minister of Defence) called a high-level meeting on 21 August to finalise the campaign plan, only

five others were present – four military professionals and one civilian. The civilian was William Hoy, the General Manager of the SAR, illustrating the early awareness that the incursion into GSWA would rely heavily on rail support.

Arthur Tippett, the Engineer-in-Chief of the SAR, had already received an instruction on 16 August to prepare for the construction of a branch line from Prieska to the south bank of the Orange River at Upington. Tippett moved quickly. He first met with Charles Cocks, the Chief Railway Storekeeper, to find ways of procuring enough rail material during wartime, which remained a major headache throughout the project. On 20 August he met with his senior engineers at Prieska to determine the route for the railway line. A reconnaissance survey of all the route possibilities was completed in two days. On 24 August Tippett reported that the line to Upington could be completed within three months. On the same day a survey party, which had meanwhile been hastily assembled at Prieska, started its work. Men and material steadily poured into Prieska, and by 31 August the earthworks team was ready to start. Another week later, on 7 September, enough rail material had arrived to start tracklaying.

CHOOSING THE ROUTE

In 1914 the area between Prieska and Karasburg was sparsely populated and almost entirely devoid of significant settlements, which are shown in Figure 1. Prieska became a railhead in 1905 upon completion of the line from De Aar, and Karasburg was reached from Keetmanshoop in 1909, the two railheads separated by a linear distance of 432 km.

Starting at Prieska, the first section posed an immediate problem. To the west of Prieska, the Doringberge form a short, but formidable barrier. To get through the Doringberge, two route options were considered. The Prieskapoort route, eventually selected, takes the shortest possible route through the mountain range, albeit at right angles to the main direction to Upington. The Glen Allen option offered a more direct route, but would take longer to break free of the Doringberge (see Figure 2). The latter was rejected due to the longer distance through difficult terrain with more earthworks and bridges.

After clearing the Doringberge, the next target was Draghoender, which served for a while during the South African War (1899–1902) as the headquarters of the Royal Australian Artillery. Immediately west of Draghoender, a further obstacle was presented by a series of small hills of bare rock which would complicate rail alignment. Tippett opted for a small detour to the southwest through a natural kloof called Grootkloof. Beyond Draghoender, the railway line could head towards either Kakamas or Upington, the only two existing settlements on the Orange River. At Kakamas, good progress had already been made with irrigated agriculture along the Orange River by the poor white settlement established in 1897 after the economic devastation of the 1896 rinderpest. Moreover, there was an easy crossing point of the

Figure 1: Main localities between Prieska and Karasburg in 1914; the yellow line indicates the international border between South Africa and GSWA (Google Earth)

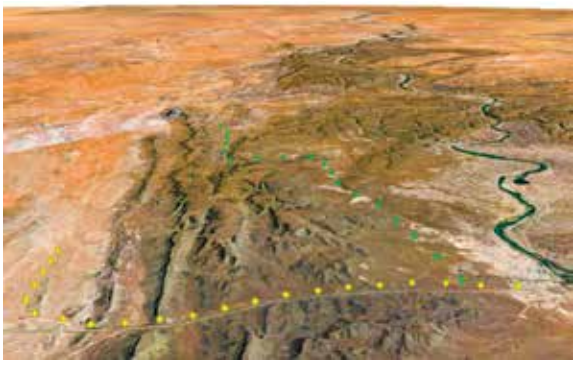

Figure 2: Route options from Prieska (right front) through the Doringberge; the yellow dots follow the railway line through Prieskapoort, while the green dots indicate the alternative through Glen Allen; the image points in the general direction of Upington (Google Earth)

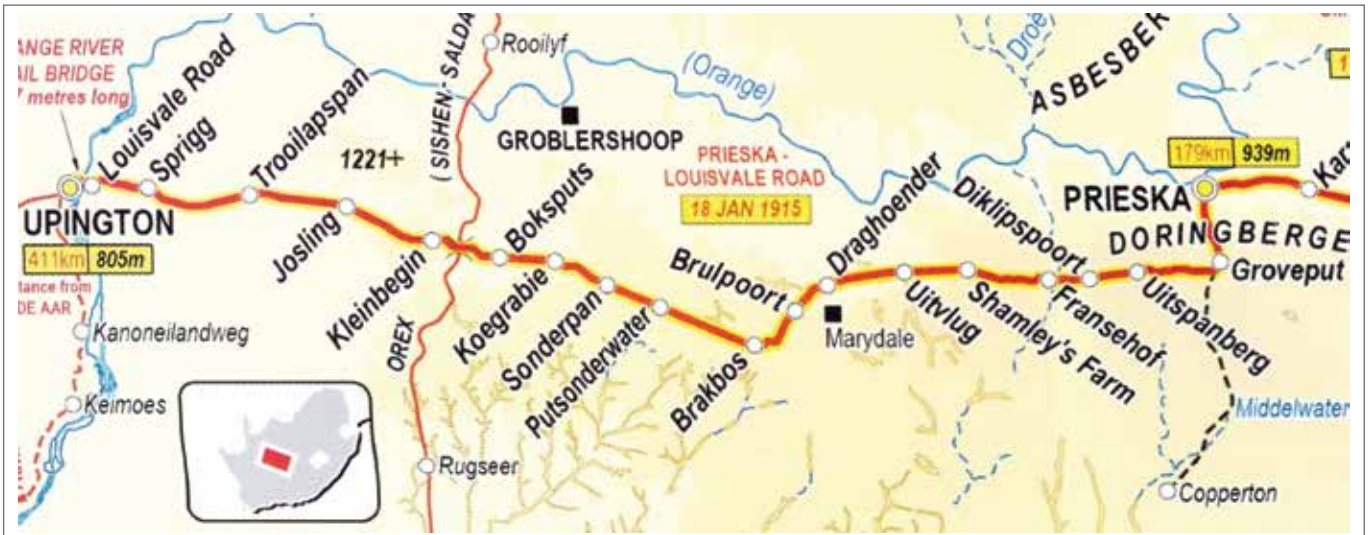

Figure 3: Railway line between Prieska and Upington, showing the deviations through Prieskapoort (near Prieska) and Grootkloof (west of Draghoender) (map by Bruno Martin, published in *Tracks across the Veld* by JNC Boonzaaier, used with permission)

Orange River at Bassonsdrif. Tippett nevertheless chose to take the line to Upington, as he foresaw greater economic advantages deriving from the Upington route, as well as Upington being better located for a military base. The route of the line finally built, with modern sidings, is shown in Figure 3.

DESIGN CRITERIA AND SURVEY

The railway line was designed to the standards of a "light branch line" with 60 lb/yard rails at the standard South African gauge of 3 feet 6 inches (using contemporary units – 60 lb/yard is equivalent to 30 kg/m). The maximum gradient was 1 in 60 (compensated) and grade compensation had to be calculated at the usual standard of 0.04 per cent per degree of curvature. The sharpest curve was limited to 8 degrees of curvature per 100 feet of track, which is equivalent to a minimum radius of 218 m. The new line would have the usual branch-line carrying capacity, and trains would travel at an average speed of around 24 km/h. For this particular line, Tippett considered the terrain "so exceedingly suitable for railway construction" that he suggested that the normal standard of 1 525 sleepers/km could be relaxed to 1 313 sleepers/km. As it turned out, the line was eventually built to an even lower standard of 1 094 sleepers/km.

The severe time constraints made it necessary to complete the site survey and track design in a single pass. To speed up matters, the survey team soon split into two parties, each with its own motor cars, assistants, mules, wagons and equipment to ensure that the survey stayed well ahead of the work. The senior members of each party were the Engineer-in-Charge, two Assistant Engineers and two Junior Engineers. All the necessary plans, sections and profiles for construction were completed on site as the surveys progressed. Staking out reached the south bank of the Orange River on 28 September, 229 km from Prieska, showing good average progress of 6.4 km/day. The rate of staking out on the easy portions reached as much as 11 km/day. "By the quick methods adopted and the energy of the staff" the survey was completed at a cost of about a third of what was expected and estimated.

CONSTRUCTION OF THE LINE

The line was constructed in three passes. First, the earthworks team cleared and levelled the route; second, the track was laid; third, the track was raised to the correct level, drainage structures were built, cuttings and embankments completed and trimmed, and the route cleaned up. This sequence roughly parallels the way that all railway lines are built, but here was an important difference. The first users of the line would not be the paying public whose comfort and safety would be the highest priority. It would be the military during wartime, demanding rail access with utmost urgency, regardless of the level of service. Tracks were therefore laid down quickly and used by the military, with as much of the usual preliminary work as possible postponed until rudimentary rail access was available.

Earthworks

The Engineer-in-Charge of earthworks was HJ Walker, assisted by an inspector, three gangers, three sub-gangers, head storekeeper, assistant storekeeper, transport conductor, three wagon conductors and a staff of drivers and leaders. The labour force was about 300 strong for the difficult first section through Prieskapoort, but was reduced to 175 from Draghoender onwards after the earthworks became easier. The organisation of the earthworks gangs required careful planning. It was imperative that the earthworks team had to stay ahead of tracklaying at all times not to delay the project. At the same time, it was endeav-

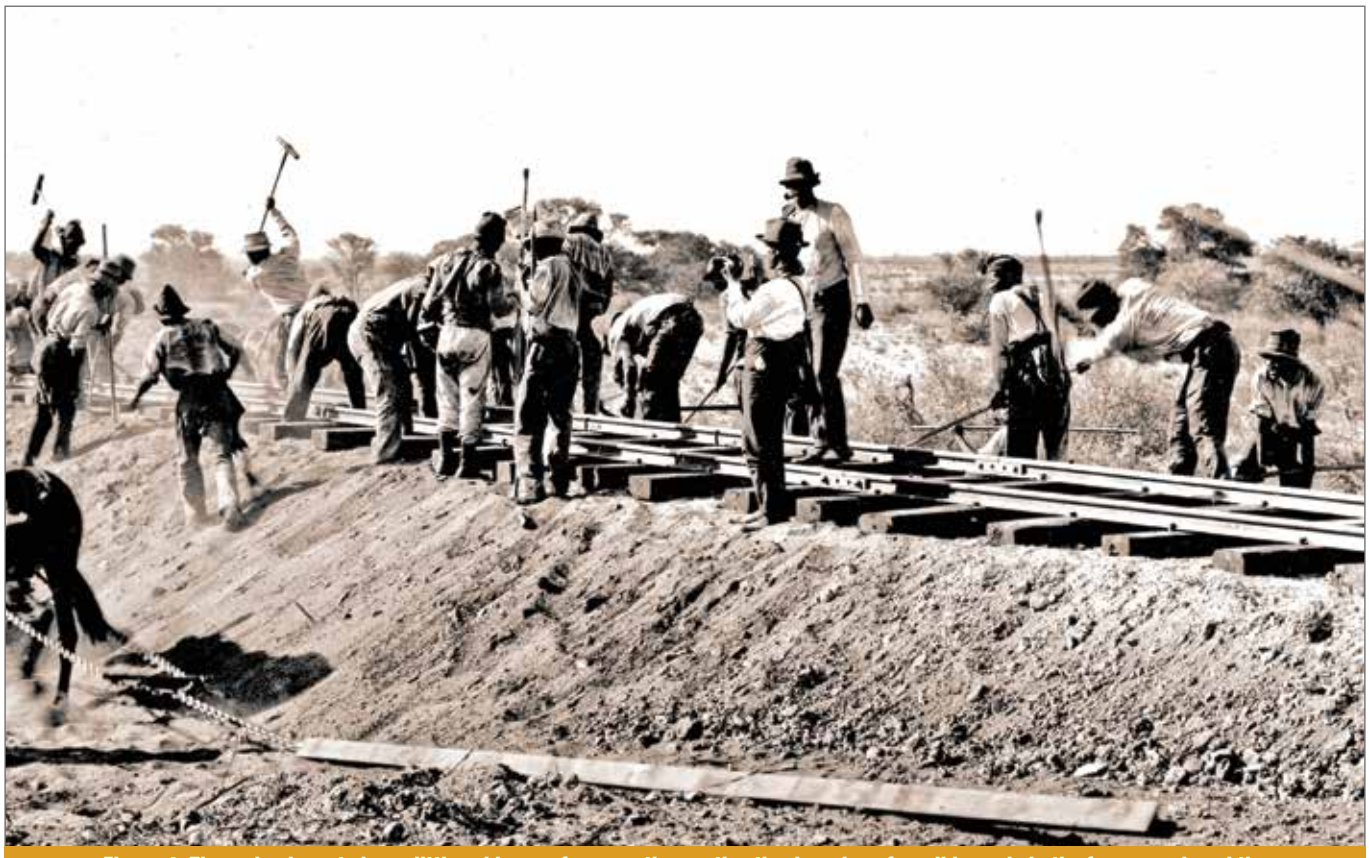

Figure 4: The embankment shows little evidence of compaction; notice the dragging of a rail by mule in the foreground, and the photographer at work in the centre of the image (Transnet Heritage Library, photograph 18567)

oured to keep them as close as possible to railhead for the supply of foodstuffs, renewal of worn-out tools and other necessities. Wagons, drawn by 130 mules and horses, were used for shifting camps, carting water and bringing foodstuffs from the railhead to the earthworks store. Upon completion of an allocated section, each gang leap-frogged the other two gangs and moved its camp forward. From its new position, the gang first worked backward until it met the previous team working forward, then worked forward from its camp until meeting the next gang, before the cycle was repeated. The camps of the earthworks gangs were spaced 3 to 4 miles apart.

Tippett confidently anticipated that construction would be easy: "The remainder of the line would be of extremely easy formation, the surface of the ground being so exceedingly suitable for railway construction that after the formation width is cleared of scrub and loose stones, the sleepers can be laid directly on the surface and then packed to a grade and good top with the small stones and grit taken from the sides. In view of this feature of the ground, which is hard and in most places rock with a few inches only of sand and grit on top, I have come to the conclusion that … an excellent road will be formed …"

After completion of the line, the view persisted that the earthworks were relatively easy: "Technically, there was about the construction little that can be called exceptional: the route selected was comparatively flat and straight, devoid alike of mountain, marsh and forest; the cuttings and embankments were few and unpretentious; only one considerable bridge had to be erected, and for hundreds of miles the rails were laid on the unprepared veld, tamping only being required."

But the earthworks, given the constraints posed by environment and time, were anything but simple. The terrain was described by the Engineer-in-Charge as being 75% sand and 25% rock, with almost no "ordinary soil" to be found. The stony sections consisted of hard, but pickable limestone. The vertical alignment of the track was kept as close as possible to the natural surface to minimise earthworks, but cuttings and embankments could not be avoided altogether. Embankments were constructed roughly. Where the line had to be raised only slightly above natural ground level, and the natural surface was not steeper than about 1:50, the embankment was simply omitted and left for correction after tracklaying. Where substantial embankments were required (up to 2 m), proper compaction "was not worried about to any extent". As soon as the railhead train passed over the embankment for the first time, a gang behind "lifted out any hollows of slacks pressed in and gave a fair running top to the road". Figure 4 shows the track being laid on a typical non-compacted embankment.

Cuttings, provided that they were less than 1.2 m deep, were excavated by hand to a width of 3.0 m and to exact grade. Where a cutting was deeper and likely to cause delay, a temporary deviation was made with curves of 152 m radius and 1:40 grades. On special occasions cuttings up to 3.0 m deep had to be excavated where the country did not permit easy deviations, but fortunately these cuttings were few.

Temporary deviations were, at first, staked and pegged by theodolite. After a while, only longer deviations of 0.8 to 1.6 km long were staked – for the shorter deviations, shortcuts were soon found: "Afterwards, with the exception of two deviations … instruments were discarded. The eye was trained to the country, and with the use of the Abney level, deviations were staked by offsets; and only where 500 feet radius curves were staked was a tape used on the work. Generally pacing was sufficient."

The earthworks team encountered numerous difficulties. The greatest problems were the lack of water and the difficulty of transport, due to "the curious and numerous sand patches which … run directly across the route of the railway and vary from a few hundred yards to about 1½ miles in width." From time to time, rebel commandos appeared in the area, which caused some disorganisation amongst the workers spread out over a long distance. (The South African Rebellion started in September 1914, and the rebels surrendered early February 1915 in Upington.) The climate was harsh, as observed at the time: "The season was one of extremes; either drought or flood prevailed. When the short rainy season did set in, floods ensued, the surrounding country was a quagmire, and road transport became almost impossible."

The earthworks team reached Upington on 7 November 1914. Although the advance work of the surveyors and earthworks gang was less glamorous than the tracklaying that followed, their contribution was recognised: "And in front of these activities, always busy, the earthwork parties toiled, shovelling sand – millions of tons of sand, that eddied and choked and blinded the workers, but in the end lay subdued. And in front of the earthwork parties the surveyors ran risks with the enemy and races with the obstacles raised by the climate and the country."

Tracklaying and completion

Tracklaying, commencing at Prieska, started with the most difficult section through Prieskapoort. The terrain was broken, and tracklaying procedures had to be worked out and refined. Hereafter, a steady rhythm was established and the speed improved. Three gangs worked around the clock in shifts of eight hours each, supervised by an engineer responsible for the efficient working of the gang. Each gang had to lay 1.6 km (one mile) of track during its shift which was readily achieved, provided that the track material was available; a gang would often complete this goal in six hours or even less.

Figure 5: A material train being unloaded after being pushed up to the railhead by the locomotive in the background, with the tent camp for construction workers in the distance (Transnet Heritage Library photograph 18631)

The track material was transported to the railhead by material trains with exactly one mile of track material loaded onto ten railway trucks. At the beginning of a shift, a material train would be brought up to the very end of the line. The activities during a shift were colourfully described:

"Mule-wagons conveyed the sleepers from railhead to the earthworks, where they were placed on position and spaced almost as fast as they fell from the wagons; mule teams dragged the rails to their immediate destination. A material train was no sooner in than the gangs attacked it, and as they attacked one saw the railway creep on, generally nearly two miles a day, once well over five miles in a day. They had an incentive these gangs, for hustling; they worked in three shifts; each gang off-loaded and laid its mile of track, then rested and criticised while another two miles of track were off-loaded and laid by the other two gangs. Night and day the work went on, after a time, yet there was a freshness about the labourers and a swing about their labours, so competitive was the spirit this arrangement of shifts – a kind of piecework – entailed."

The hectic activity during the unloading of a material train is depicted in Figures 5 and 6, taken in opposite directions from the railhead. Once a material train was empty, it would be replaced by the next full train load, ready for the next shift. Temporary slips were laid every mile or two for the switching of the full and empty trains at railhead and were removed as the work advanced. Figures 7 to 10 illustrate the different steps of tracklaying in more detail.

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Figure 6: Different phases of tracklaying immediately ahead of the railhead (Transnet Heritage Library photograph 18565)

Figure 7: The track preparation on level ground was rudimentary with no compaction (Transnet Heritage Library photograph 18618)

Figure 8: Sleepers were transported by wagon and placed by hand (Transnet Heritage Library photograph 18621)

Figure 9: Rails were drawn to their approximate position by mules and chains before being placed by hand (Transnet Heritage Library photograph 18622A)

Figure 10: As soon as the rails were fished and fixed to the sleepers, "muck ballast" was shovelled up to the underside of the rails (Transnet Heritage Library photograph 18636)

The average tracklaying rate was slightly more than 3.6 km/day; less than the 4.8 km/day (3 miles/day as it was commonly stated) originally anticipated. The work was slowed down by the threatening presence of rebels in the area (which stopped work for six days), delays in getting materials delivered in time, and the necessary precedence to be given to the movement of troops, horses and military supplies.

Communication by telegraph from the railhead was essential to coordinate the complicated scheduling of material trains and the military movements. Each material train, along with its one mile of track material, therefore also carried one mile of telegraph wire with poles to allow the extension of the telegraph line to keep up with the railhead. But for some reason the construction of the telegraph line slowly fell behind. By 12 November, the telephone line was 18 km behind the railhead, serious enough for SAR General Manager Hoy to get involved at the highest level. Hoy's authority drew immediate reaction and the telegraph line caught up rapidly hereafter. By 17 November the telephone line was only 10 km behind, and it reached Upington on Thursday 20 November on the same day as the railhead.

Although not the first time to be used in South Africa, a sophisticated lighting system was developed to allow tracklaying at night. A long open bogie truck, at the front of the railhead, was fitted with a 15.2 m long boom cantilevering forward. From the boom, 3 m above the track, five incandescent lamps with reflectors provided evenly diffused light on the track below. Two more lamps at the tip of the boom illuminated the track for a further 37 m ahead, sufficient for the gangs laying rails, fixing joints or dogging sleepers. The bogie truck was followed by a covered van with engine and belt-driven dynamo to supply power. Two large fixed lamps on the back of the lighting truck provided light on the material train behind. Figures 11 and 12 show the lighting truck by day and by night.

The tracklaying team was closely followed by a gang which lifted the track where necessary and packed the track to give a smooth running top to the rails. The line was then handed to a permanent maintenance gang, who removed the minor deviations. Large deviations had to be removed by special gangs to

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prepare the permanent roadbed and throw over the line from its temporary to its permanent position. Once the line was in its permanent position, a number of contractors built small bridges and culverts, lifted the track to its permanent level with the associated ballasting and packing, and widened the embankments and cuttings to specified width.

MOBILISATION OF MATERIAL

The SAR was not prepared for war. Furthermore, they were cut off from their overseas supplies of track material and rolling stock. The sudden need for rail materials, precipitated by World War One, was enormous. The GSWA campaign, all rail projects taken together, ultimately required 1.08 million

Figure 11: The lighting truck at the front, with the covered truck behind (Transnet Heritage Library photograph 18559)

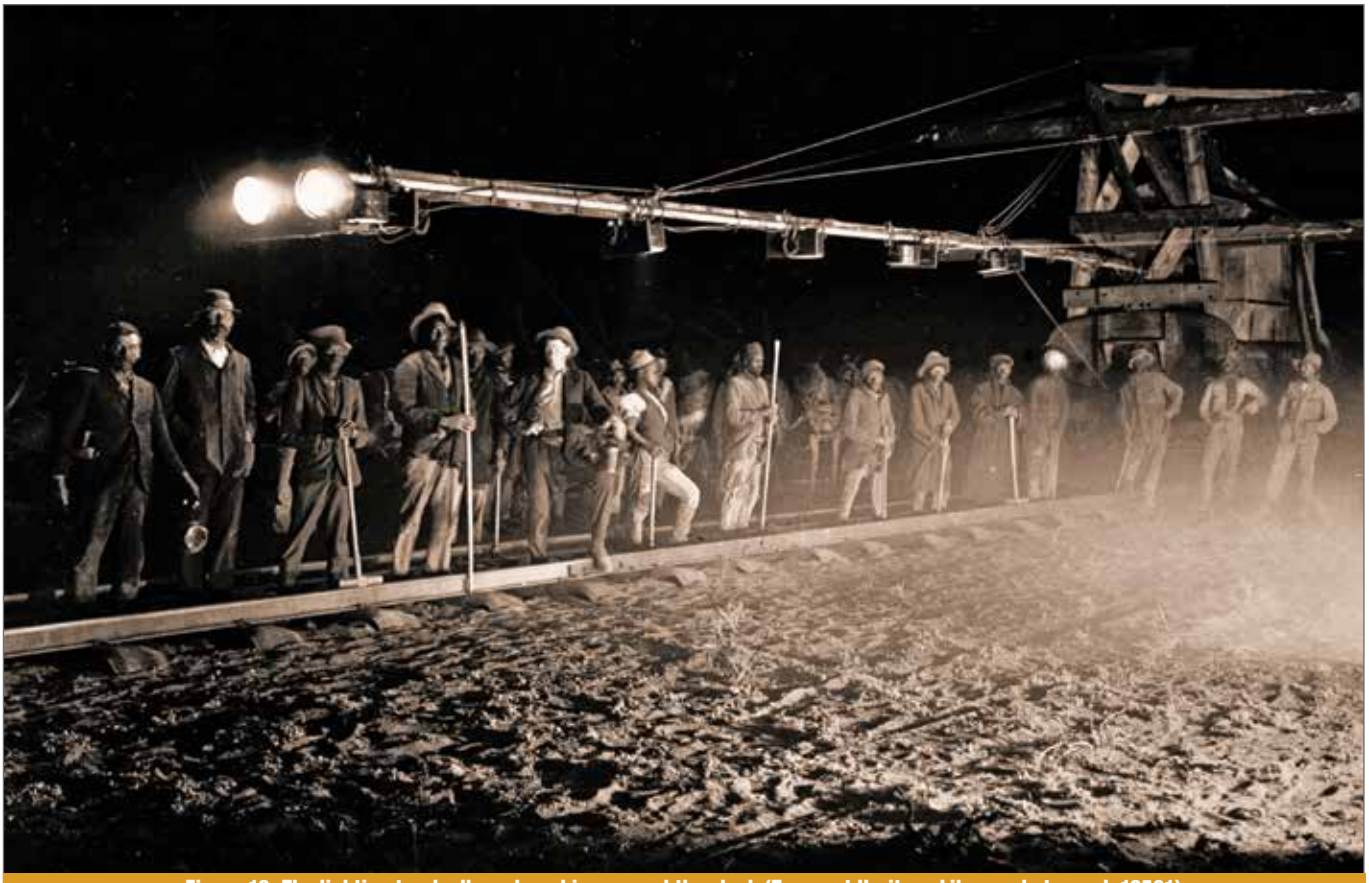

Figure 12: The lighting truck allowed working around the clock (Transnet Heritage Library photograph 18561)

sleepers and 129 000 tonnes of rails. Where would these, with associated tools, tents, temporary buildings, and all other necessary equipment come from? There were only two options, both vigorously pursued.

The first action was an immediate instruction to all railway employees throughout South Africa to scavenge absolutely all permanent way material that could be spared and to despatch it immediately to De Aar, a major junction at the start of the branch line to Prieska. General Manager Hoy issued stern, firm directives on more than one occasion to all SAR employees to collect every single redundant item – those lying around, or used for building or fencing purposes, even recovered from uplifting sidings, dead-ends or triangles. The result was impressive. In addition to permanent way material, large quantities of tools and stores of a general nature were forwarded, including water tanks, water carts, pumps, marquees, tents, harnesses, trolleys, wheelbarrows, picks, shovels and hammers, and a host of miscellaneous but equally necessary articles. Even Hoy was impressed:

"The sudden and unexpected call for material far in excess of the stocks on hand or on order was not entirely unproductive of good, as it led to a universal 'clearing up' of all lines and depots on a scale beyond anything previously attempted. … No less than 152 miles of rails, 360 000 sleepers and 469 sets of points and crossings were picked up throughout the Union, in addition to what was released from relaying works."

A second source of track material was fortuitously offered by an ongoing rail relaying programme of the SAR. By the end of 1913, South Africa had a total railway length of about 12 500 km, many laid with 30 kg/m rails. The introduction of heavier rolling stock with higher axle loads on the main lines made it necessary to replace these rails with heavier material – for this purpose, a large supply of heavier rail had been imported earlier and used for an ongoing programme to re-lay the main lines. By speeding up the re-laying programme, the redundant second-hand 30 kg/m rails could be released quicker for use on the Prieska – Upington branch line.

All the material thus collected for the Prieska – Upington line was sent to De Aar. At De Aar a special yard was prepared to collect the loads of miscellaneous material: "… as the weeks went by, trainloads of material, some hundreds of trainloads in all, steaming into De Aar, where the unique variety of sleepers, rails, fishplates, bolts and what-not, from every corner of the country, were with precision and rapidity graded to secure uniformity of sections …"

This material was sorted, classified and reloaded in complete sets of one mile lots of track, comprising sleepers, rails and their respective fastenings. Each such lot made up one material train, which was despatched via Prieska to the railhead. The train waited at the railhead until its mile of material was off-loaded, and the empty train returned to De Aar. Twelve locomotives were dedicated to this purpose during the construction of the new line.

Heavy demands were also made on locomotives and other rolling stock. By the end of 1913, there were 1 428 locomotives in

service in South Africa, with 28 new ones put in service during 1913. During 1914, no less than 95 new locomotives were added. In addition, the Railways workshops repaired and reconditioned 59 locomotives, and built or adapted 519 railway trucks and 23 water tanker trucks.

THE COMPLETED LINE

When the rails ultimately reached Upington on 20 November, the Rebellion was at its height and the town was anticipating an attack from the rebels commanded by General Manie Maritz. The new, semi-completed line was put to an extreme test as troops, horses and equipment were hastily poured into Upington by an incredible convoy of about 50 trains:

"The very day that the track arrived at the south bank of the Orange River, a stream of trains bearing troops approached from Prieska. There was no time to form a proper station, the trains simply had to go as far as possible, congesting into a pack of rolling stock about ten miles long. There the troops were offloaded and the railway officials left to disentangle the jumble of coaches, trucks and engines paralysed for want of water and coal."

The completed line from Prieska to the south bank of the Orange River at Upington measured 229.2 km. To meet the needs of the military, a further 19.7 km of sidings were provided, more than would have been built in peacetime. The line included one fully equipped station at Draghoender, and twelve more sidings spaced between 14 and 37 km apart. The actual cost of the line was close to the £2 250/mile originally estimated:

"It is interesting to note that although this construction was carried out while the country was in a state of war, and no expense was spared to accelerate the speed, the cost per mile (up to the south bank of the Orange River) which has now been ascertained, shows it to have been one of the cheapest lines which has ever been constructed in South Africa."

Bear in mind that there were about 16 other lines under construction in South Africa at the same time. The Prieska – Upington line made up roughly 23% of the new lines opened

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Figure 14: Construction of the railway line from Prieska to Upington in 1914

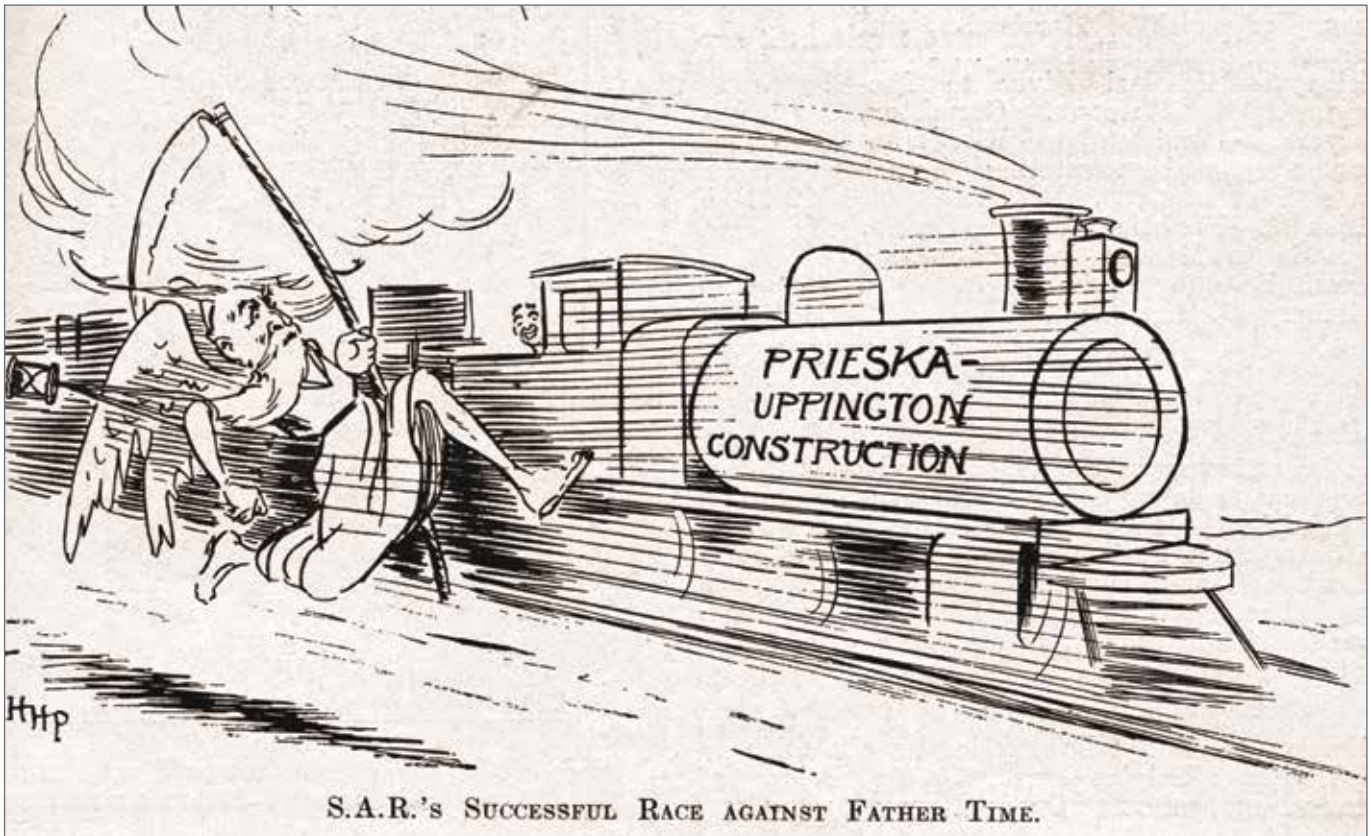


Figure 13: A contemporary cartoon (South African Railways and Harbours Magazine, January 1915, p 9)

for traffic in 1915, and it was not subsidised by the other projects. Almost all these lines were completed within their estimates, despite a wartime rise in costs, a serious shortage in the supply of cement during a part of the year, and a shortage of engine power throughout the Union. The most remarkable feature of the Prieska – Upington line, however, was its rapid rate of construction, a rate unequalled in South African railway history at the time (see Figure 13 for a contemporary cartoon):

- The instruction to proceed was received on 16 August, only eight days before the surveyors started working, which left practically no lead time for advance planning and the orderly securing of men and material.
- The survey and staking out (24 August to 28 September) was completed at an average rate of 6.4 km/day.
- The earthworks team (31 August to 7 November) progressed at an average daily rate of 3.9 km/working day (Sundays were resting days).
- Tracklaying (7 September to 20 November) covered a period of 75 days, but military traffic interrupted tracklaying for about 12 days, resulting in an actual average tracklaying rate of 3.6 km/day.
- A new South African daily tracklaying record was set from midnight 1 November to midnight 2 November, when 5.2 km of track was laid. During this 24-hour period, 610 metric tonne of material was handled by a workforce totalling three engineers, 18 artisans and about 300 labourers.

The SAR construction team was showered with praise after their arrival at Upington. Foremost was a message from General Smuts to the SAR:

"I wish you on my behalf to congratulate railway staff on arrival of railway at river, and to express to them my appreciation of great services they have so unstintedly and devotedly rendered in strenuous times through which we are passing."

The Resident Engineer in charge of all the different site activities was Nicholas Kingswell Prettejohn, one of the most colourful characters in our engineering history. Prettejohn was singled out by the Railways Board for his "zeal and untiring efforts displayed". General Manager Hoy added his praise in a letter to Prettejohn:

"You have established an excellent record in railway construction in this country under particularly trying and adverse conditions, and I take this opportunity of adding my congratulations and of expressing to you my gratification with the result of your labours."

The appreciation extended beyond the senior engineers all the way to the lowest ranks of the SAR:

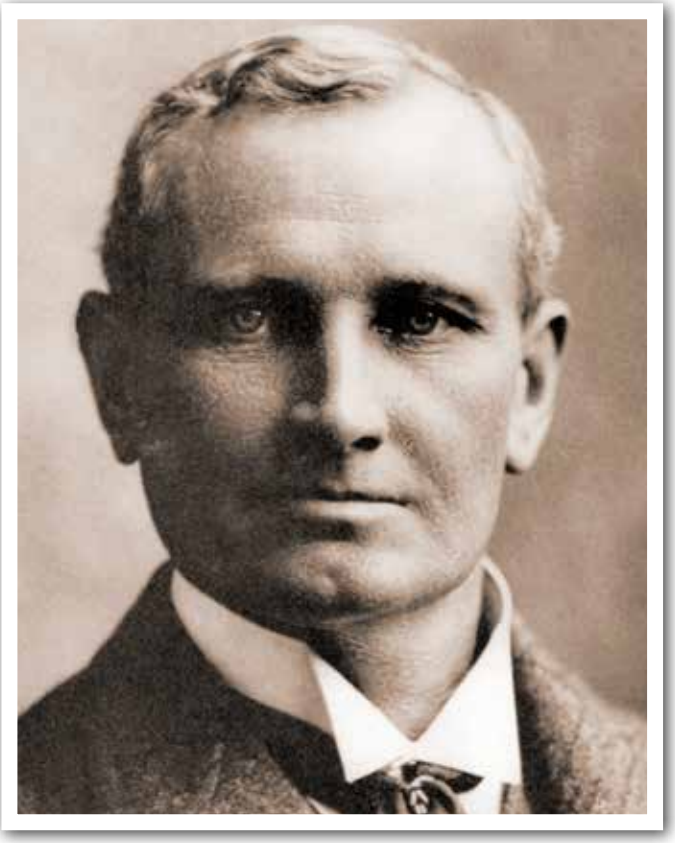
"Every permanent-way inspector, every ganger, every labourer along the line in the Union who, by greater exertion and longer working day helped towards the great object, 'did his bit' as surely as the man with the rifle to bring our campaign to its speedy and successful conclusion."

Finally, the modern reader has to be reminded of the complicated, turbulent national context while the SAR engineers toiled on the railway line. A simplified timeline is shown in Figure 14. It is evident that almost everything worked against the project, yet the line was completed within time and budget. But there was no time for rejoicing at Upington. A new challenge was already waiting on the engineers for their immediate attention – to be told in the second part of this series.

ACKNOWLEDGEMENTS

The three parts of this series relied heavily on material obtained through Yolanda Meyer of the Transnet Heritage Library. Footnotes and referencing were omitted in this version, but a fully referenced copy is deposited with the Transnet Heritage Library and is also available from the author. Further useful material was found in early copies of the SAICE magazine/journal – a valuable resource for all interested in the history of civil engineering in South Africa.

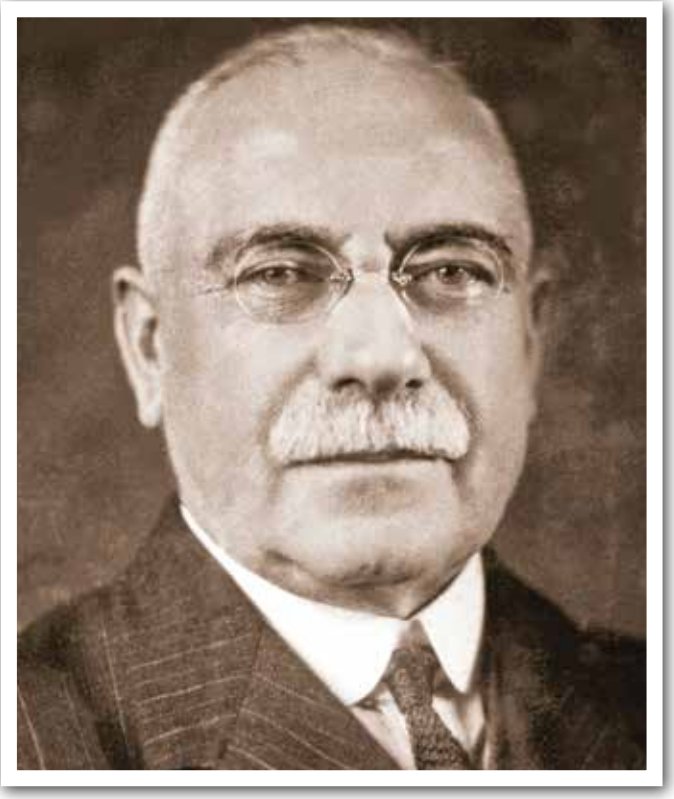
ARTHUR MAY TIPPETT (1859–1939)



Arthur May Tippett was born on 20 November 1859 in England and educated at Brighton College and later at the Crystal Palace School of Engineering. He started work as assistant on the Furness Railways and Barrow Docks, before entering private practice in June 1883 in London where he provided architectural and quantity surveying services, and produced plans and estimates of railways and other engineering works. He left for South Africa to be employed in November 1889 by Cecil John Rhodes's British South Africa Company as Assistant Engineer for the railway line from Kimberley to Vryburg. He joined the Cape Government Railways (CGR) in March 1891. For the next ten years, until June 1901, he was posted to numerous projects. Many of them were surveys for proposed new lines (e.g. Kaapmuiden to Barberton over 32 miles of difficult mountainous terrain, Oudtshoorn to Klipplaat, Somerset East to Kingwilliamstown, Port Elizabeth to Avontuur, Amabele to Umtata). Others included construction of new lines (e.g. Bloemfontein to Vereeniging, Graaff-Reinet to Rosmead, Port Elizabeth to Avontuur) or bridges (e.g. Fourteen Streams). From February 1894 to June 1895, he was briefly seconded to the Cape Public Works Department to take charge of the Sundays River Bridge and the Oudsthoorn Water Supply. From June 1901, he was promoted to Chief Resident Engineer to oversee numerous (but not all) CGR projects, including the construction of the De Aar to Prieska extension. In June 1904 he became the Chief Resident Engineer for all CGR construction projects. In January 1907 he rose to the second-highest engineering position of Assistant Engineer-in-Chief of the CGR. When the new SAR started operation in July 1910 after Unification, he was appointed as its Engineer-in-Chief, a position he held until his retirement at the end of 1920.

Tippett was widely respected. He was a Member of the Institution of Civil Engineers in London, a founding Member of the Cape Society of Civil Engineers in 1903 and was President of the latter in 1908. On occasion he acted as independent consultant, for example to De Beers Consolidated Mines for the Klerksdorp – Fourteen Streams railway. Within the SAR, he was recognised as a "man of great ability, renowned for outspokenness". At his retirement dinner, he admitted "that he was supposed to be a hard man, but … thought that those who knew him best were of a different opinion, and that he had really tried to be just". The Tippett Building at Park Station, Johannesburg, completed in 1955, stands in his memory.

WILLIAM WILSON HOY (1868–1930)



William Wilson Hoy was born on 11 March 1868 in the parish of Portmoak in Kinross-shire, Scotland, as the son of a small-scale farmer. After elementary education, he joined the North British Railway Company as a junior clerk in the Goods Manager's office in Edinburgh at the age of 12. Here he became thoroughly competent in various branches of railway working, and in addition, a very proficient shorthand writer. He became aware of opportunities in South Africa through the *Cape of Good Hope Handbook* published in 1886 and signed up with the Cape Government Railways (CGR) at the age of 21. On arrival in South Africa, the young man's knowledge of railway working, his good handwriting and shorthand qualifications were recognised and he

was appointed to the office of the Traffic Manager. It is claimed that Hoy was the first government official in South Africa to use a typewriter. For the next ten years, he was deployed for shorter terms at different locations – Kimberley, Kroonstad, Viljoensdrif and Johannesburg, Kimberley again, Bulawayo and Port Elizabeth.

With the outbreak of the Anglo-Boer War in October 1899, the Canadian Percy Girouard – newly appointed Director of Imperial Military Railways – journeyed to Port Elizabeth to recruit Hoy personally for the war effort. As all railway operations became subservient to military demands, Hoy's appointment, at the age of only 32, to manage the logistics of this huge undertaking from Johannesburg practically elevated him above all other senior railway officials in the Cape and Natal. The credits for the success of the Imperial Military Railways during the war belong to a large extent to the administrative talents of William Hoy. After the war in 1902, the rail systems of the two Boer republics were placed under the control of a newly formed Central South African Railways (CSAR). Hoy was appointed as the Chief Traffic Manager of the CSAR, thus remaining in Johannesburg. In January 1909, he was promoted to the specially created position of Assistant Manager of the CSAR. In the short span of its existence, the CSAR became the model railway in South Africa.

At the age of 42 years, Hoy was appointed in 1910 as the first General Manager of the SAR, the entity formed to manage the entire rail system of the new Union of South Africa. The amalgamation of the three large existing railway administrations was a formidable task. Apart from the still simmering colonial jealousies, Hoy had to build a team of managers from railway systems which not long ago were engaged in cut-throat competition. Unravelling and undoing the customs policies of the recent past, endeavouring a just distribution of traffic to the various regions without igniting another rates war, were but the beginnings of the new General Manager's problems. To this were added the complexities of coordinating three sets of railway laws and regulations, uniform railway operations, rate-making and hammering out a personnel policy, the most difficult of which was the drafting of a standardised staff regulation book. Hoy's life was not made easier by the ever present militant trade unions. His contribution to the 1914/15 GSWA campaign, after a knighthood was conferred on him in 1916, was recognised by the *Times of Natal:*

"The success of the Union Forces in South-West Africa was, in a large measure, due to the organising ability of South Africa's railway chief – and by his splendid work during the campaign. Lieutenant-Colonel Hoy well-earned the honour that His majesty has been pleased to confer."

Hoy was a man of broad vision and is credited with the introduction of grain silos in South Africa, the introduction of road motor services as supply lines to the railways, developing the tourism industry in South Africa, and the start of electrification of the South African rail system on the Natal main line. His bold and imaginative leadership gave rise to the SAR being nick-named "WW Hoy Ltd". William Hoy retired on 11 March 1928. Failing health towards the end of 1929 forced him to return to the village of Hermanus, his favourite holiday resort, where he died on 11 February 1930 after a "painful illness". In keeping with his wish to keep his funeral quiet and simple in character, 30 pall-bearers, all fishermen, carried his coffin in relays to the top of Hoy's koppie, where he was buried in a specially-hewn grave.

Civillain by Jonah Ptak