Construction of the Prieska–Kalkfontein railway line 1914–15

# Part 3: The final dash to Kalkfontein

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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 (the final in the three-part series) describes the construction of the rail link between Upington and Kalkfontein. After bridging the Orange River at Upington (see Part 2), the laying of track through an arid, barren Kalahari encountered similar, equally serious problems as the initial rail section from Prieska to Upington (see Part 1). (Parts 1 and 2 of this series appeared in the March and May 2015 editions of *Civil Engineering*.)

## SURVEY AND ROUTE SELECTION

The police station at Nakop, on the border between South Africa and German South-West Africa (GSWA), is halfway between Upington and Kalkfontein. The Upington–Nakop or 'South African' section is 142 km long and the Nakop–Kalkfontein or 'German' section 135 km. The South African section faced a technical obstacle in the form of a belt of sand dunes, extending in a north-westerly direction from Upington for about 100 km. This area was carefully explored to avoid cuttings of any depth to keep the line clear of drifting sand. On the German section, the terrain was more mountainous, but the engineers had no detailed maps to trace the best route to Kalkfontein. A "very thorough and widespread reconnaissance" was quickly conducted, and the SAR engineers eventually opted for a route close to the base of the mountains to the south which would minimise difficult climbs. The final route is shown in Figure 1.

When the SAR was instructed in October 1914 to continue the railway line beyond Upington to Kalkfontein, the Rebellion was in full swing. Rebel leader General Manie Maritz had his headquarters at Ukamas in GSWA, squarely in

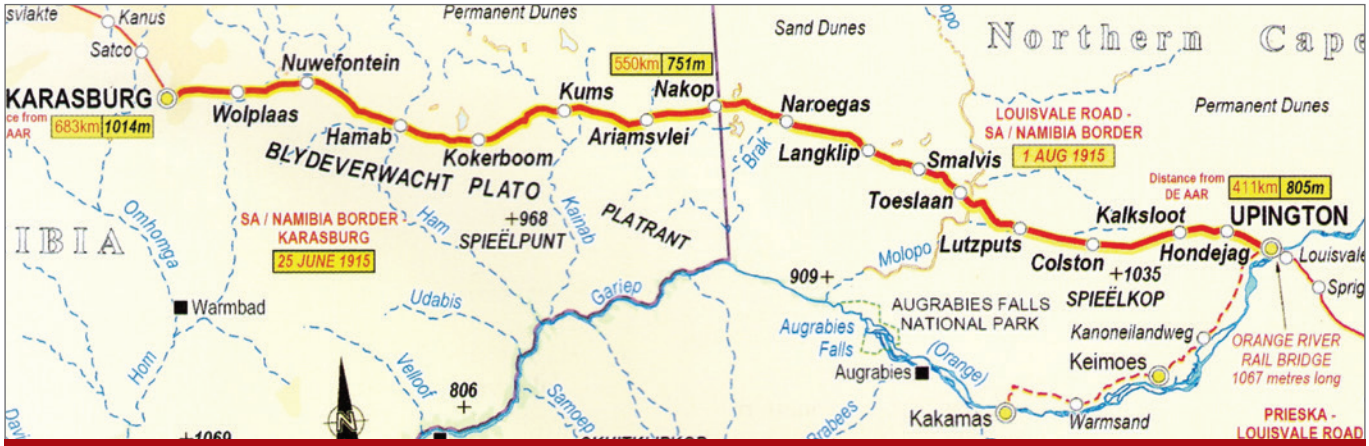


**Figure 1: Railway link between Upington and Karasburg (map by Bruno Martin, published in *Tracks across the veld* by JNC Boonzaaier, used with permission)**

the way of the planned rail extension. The military authorities therefore cautioned the railway surveyors not to venture beyond Upington. On 20 November 1914, the day that the railhead from Prieska reached Upington, Engineer-in-Chief Tippett, itching to continue, asked SAR General Manager Hoy that an "... arrangement should be made to provide military protection for the survey party at once and for the construction staff later on if found necessary." The Department of Defence cautioned again that it was not safe to survey beyond Upington, as enemy patrols in the neighbourhood were observed on a daily basis. Hoy agreed that the survey should be postponed. By early December, military intelligence indicated that Maritz had retired to the German side of the border and the survey commenced forthwith.

The survey party, headed by Engineer Erskine-Murray, consisted of five engineers with two motor cars, mule wagons and associated equipment. Their work progressed smoothly up to Lutzputs, where they shared a camp with a small body of Union soldiers holding the water supply. On 18 January 1915, the Lutzputs outpost was overrun by about 1 000 rebels with six guns and two maxims. They took 160 prisoners, including the entire survey party, also killing one survey assistant during the skirmish and wounding another. The rest of the survey party was unhurt, soon released and allowed to return to Upington along with the other prisoners. However, all their personal effects, notes and surveying instruments were confiscated and disposed of by the rebels.

The rebels attacked Upington soon afterwards on 24 January 1915, but were repulsed with losses. Unconditional surrender followed on 2 and 3 February. This time, the survey party took no chances and waited until a large contingent of troops had gone forward to Nakop before they made a fresh start on 14 March. As a precaution against possible capture by German forces, the Defence Department gave military rank and uniforms to all the members of the survey party. Hereafter, the survey and staking out of the line continued without interruption until the party reached Kalkfontein on 28 May 1915. The average rate of progress (survey and staking) was 3.6 km/day.

## CONSTRUCTION OF THE LINE FROM UPINGTON

The earthworks team, for the same security reasons, also had to hold back, only starting at Upington on 4 March. The construction to Kalkfontein was tackled in roughly the same

**Figure 2: The harsh, dry terrain just before Kalkfontein (Transnet Heritage Library photograph GSWA018)**

manner used between Prieska and Upington, but some procedures had to be adapted for the different terrain. The surface geology from Upington to Kalkfontein was characterised as "75% rock, 25% sand" – opposite of what was encountered earlier between Prieska and Upington. The sand was mostly confined to the belt of sand dunes close to Upington. Cuts were minimised to avoid the covering of tracks by drifting sand, and a few large embankments were therefore required. Westward of the Molopo River (about halfway in the South African section) the surface geology changed to closely bedded rhyolite boulders – "the heaven had rained rocks" as a contemporary engineer described it – which extended almost all the way to Kalkfontein. To make cuttings of only 75 mm deep, large boulders had to be excavated to a depth of as much as 450 mm. The Engineer-in-Charge of earthworks lamented: "This seemed to break one's patience, specially when the rails were coming forward at a rate of 4 miles a day. The linking in was moving forwards both night and day, 7 days a week, unless delayed by material shortage; whereas earthworks gangs only worked 6 days a week and only during daylight."

As before, deviations had to be made when the earthworks team was in danger of being caught by the track-laying team. The size and position of the earthworks gangs had to be judiciously managed, while keeping the labour force to the minimum: "Although gangs had to be strengthened up, there was a limit to the size and number of gangs to be employed, ruled by the food, water, tools, etc, requiring transport and the number of wagons available."

Engineer Walker, in charge of earthworks, increased his labour force to five gangs with a total of 350 labourers, supported by seven wagons (for Prieska–Upington he used three gangs with a total of 175 labourers, supported by five wagons). Whereas the gangs were spaced 4.8 to 6.4 km apart earlier, he now moved them further apart to 6.4 to 12.9 km. It was only towards the end of the section, near Kalkfontein, that the pressure on the earthworks team eased somewhat: "By constant watching and placing gangs in position best suited for pressing the work forward, the earthworks were carried out without once delaying the rails, but it was not until the open country was met with before reaching Kalkfontein that the work was easy and headway was made, and it was here that the biggest mileage of roadbed was constructed in any one day, namely 16 miles, and the minds of everyone on earthworks were relieved of the worry of keeping out of the way of railhead; even the natives shewed pleasure as they knew their strenuous time was over and normal working hours again the order of the day."

The earthworks team started work at Upington on 4 March 1915 and reached Kalkfontein on 22 June – see Figure 2. The earthworks were completed in 95 working days at an average rate of 2.9 km/day.

The severe flooding of the Orange River at Upington, starting on 1 December 1914, prohibited the continuation of bridgework (see Part 2 of this series for a full account of the problems encountered with the river crossing at Upington). The remaining two wagon ponts, four motor boats and ten

**Figure 3: The last rail being laid before Kalkfontein; note the ends of the German rail at the bottom edge of the photograph (Transnet Heritage Library photograph GSWA020)**

rowing boats could only convey enough track material to the northern bank to complete the section from the train ferry (then under construction) to the planned main line. Meaningful progress with track-laying beyond Upington could only begin once the train ferry was completed on 14 March. From 14 March to 16 April, the train ferry carried 64 km of track-laying material across the river, as well as three locomotives to move the material further down the line. After the completion of the temporary bridge on 16 April, the flow of track material was further increased and the track-laying team moved into top gear. The track-laying team reached Nakop on the border on 17 May, and Kalkfontein on 25 June, breathing down the neck of the earthworks team who had only arrived three days earlier. The placement of the last rail at Kalkfontein is shown in Figure 3.

The track-laying was completed in 104 days at an average track-laying rate of 2.7 km/day. A breakdown of the progress shows a steady improvement. The first part was laid at 1.2 km/day (when the train ferry limited the full supply of material); the second part at 2.8 km/day (the difficult section up to the German border); and the third part at 3.5 km/day (when conditions were better with optimised procedures). These average track-laying rates would, of course, have been higher were it not for the unproductive days when the military claimed the completed section for their own use. A new South African record of 8.5 km for daily track-laying was set, improving on the previous record of 5.2 km/day set only a few months earlier between Prieska and Upington. The new record was set on


**Figure 4: A proud Engineer Prettejohn on completion of the line to Kalkfontein (Transnet Heritage Library photograph GSWA005)**

23 June 1915, two days before arriving at Kalkfontein. Resident Engineer Prettejohn, posing at Kalkfontein in Figure 4, had reason to be proud and relieved to have reached Kalkfontein after starting at Prieska ten months earlier.

## WATER MANAGEMENT

A serious lack of water crippled the project from its beginning at Prieska. From Prieska to Nakop water was practically unobtainable other than taking it directly from the Orange River. For locomotives, the groundwater was generally too brackish. Where there was no option other than groundwater, engines failed frequently, with as many as six or seven "dead engines" on some occasions. One can sense the frustration in a telegram sent from site to head office on 10 November: "Engine failures again numerous and movements of material to railhead practically suspended. … Three total failures within last 12 hours … train ex Prieska taking 12 to 20 hours to make a 5 hours schedule run …"

Locomotives therefore had to carry their own water, each construction engine fitted with two extra cylindrical tanks of 23 000 ℓ each. At the start of the project at Prieska, the watering stations between De Aar and Prieska (serving that line since 1905) were the most convenient sources for the engines running between De Aar and Prieska. The heavy construction traffic demanded much more water than before and, somewhat predictably, the watering stations could not keep up and suddenly failed. The locomotives starting at De Aar now had to take in more water, which had to be brought by rail from the Orange River at a point 110 km north of De Aar! Rail water tankers had to be procured in considerable numbers and additional tanks had to be constructed.

Water was also required for the construction teams with their animals, as well as the 135 000 troops and 169 000 animals transported during the construction period to GSWA. The method of watering the animals is shown in Figure 5. From the start of the project, the Irrigation Department employed five drilling machines to put down numerous boreholes, shown in Figure 6. The drilling programme failed to obtain anything but an occasional small supply adequate for domestic purposes, but quality inadequate for running locomotives. Where groundwater was found, it had to be carted to the construction areas by wagons over very rough country for distances up to 21 km. The earthworks team, often far ahead of the railhead, mostly had to rely on this source.

The water management problem was most severe in the desert-like section between Upington and the border. Some relief was offered when the Molopo River (crossing the line about halfway between Upington and Nakop, just west of Lutzputs) came down in flood during February 1915 – an unusual occurrence: "At several places in the valley large lakes were filled and two of these, being within a few miles of the railway crossing, were tapped and used during construction. One of the lakes, being about 4 miles long, 1 500 feet wide and average depth 6 feet, is expected to last for at least a year."

From the border at Nakop to Kalkfontein, the water situation was less severe, as the line, for the most part, skirted the base of a series of mountains. The drainage pattern from the mountains formed several large valleys with considerable runoff in the rainy season. Drilling for water in these valleys was more successful, with good supplies of fresh water secured at intervals of about 35 km. To make up the balance of the water requirements, there was no other option but to

**Figure 5: Water being discharged from a rail tanker into a temporary canvas-lined hollow for watering the mules (Transnet Heritage Library photograph GSWA017)**

bring water forward by locomotive. A fleet of about 15 locomotives was operational during the construction period, one a dedicated "water train". The water train obtained water from the Orange River at Upington, from the temporary lakes formed by the Molopo, and from a small supply of good water pumped from a well at Nakop on the border.

## LINKING UP WITH THE GSWA RAIL SYSTEM

While the SAR was racing to complete the rail to Kalkfontein, a similar effort was under way by the South African Engineering Corps (SAEC) to restore the line beyond Kalkfontein to working condition. The SAEC was a formal military unit, commanded and predominantly staffed by SAR officials, operating full-time in enemy territory and under direct military control. The SAEC, which had to obtain all their equipment and supplies by ship from Cape Town via Lüderitz, started their work of fixing the sabotaged railway line and blown-up bridges at Lüderitz, working their way towards Keetmanshoop as the military campaign slowly progressed over the difficult barrier posed by the Namib desert. The line from Kalkfontein joined the Lüderitz–Keetmanshoop line at the Seeheim junction. The repair work posed its own challenges, not covered here – suffice to say that it took 58 days to get the last 302 km before Seeheim back into operation. The repair team, under command of SAR Engineer Cocks, reached Seeheim on 29 May 1915.

While the main SAEC repair team under Cocks continued on the main line towards Keetmanshoop, a second SAEC party, under command of Captain Bateman, arrived at Seeheim to get the Seeheim–Kalkfontein branch line into operation. The total length of the Kalkfontein–Seeheim section

**Figure 6: One of the five rigs drilling for groundwater to supply the Prieska–Kalkfontein railway line (Transnet Heritage Library photograph 18679)**

is 286 km. The Bateman party started on 8 June and arrived at Kalkfontein on 21 June, recording remarkable average progress of 20.4 km/day. Bateman's repair party from Seeheim reached Kalkfontein only four days before Prettejohn's tracklayers did the same from Upington. Another SAEC milestone was reached on the same day, 21 June 1915, when the German rail system allowed through traffic all the way from Lüderitz via Keetmanshoop to Windhoek, and back to the coast at Swakopmund. This only left the extension to the north, from Karibib to Otavi, damaged and incomplete. Reconstruction from Karibib started on 21 June. At the time of the German surrender on 8 July at Otavifontein, the railhead had already progressed 216 km beyond Karibib, 121 km short of Otavi. By 16 July 1915, the line was through to its terminus at Grootfontein, with all railway lines in GSWA repaired and connected to the South African rail system.

In retrospect it almost seems as if all the activities at the time were choreographed to climax during June/July 1915. Figure 7 provides a timeline to cover the railway activities during 1915, and how they meshed with the military conclusion of the campaign.

## PERSPECTIVES ON THE PRIESKA–KALKFONTEIN RAIL LINK

### Military benefits

Looking at the entire GSWA campaign, there is no doubt that the advance of the railways within GSWA, closely following the military frontline, was a key ingredient to its success. A modern analysis of the campaign comes to the conclusion that "… because the war for Namibia was fought for, along, and through railway tracks it is best described as a 'railway war'." But cynics may claim that the huge effort invested in the Prieska–Kalkfontein rail link contributed little to the success of the military campaign. What good is a railway line completed only two weeks before the final surrender of the enemy?

The military benefits of the line were twofold. First, the military had control over the line and claimed it for their own use as they wished. Materials were conveyed as far as possible by rail and thereafter by donkey, mule and ox wagons. From August to December 1914 (when the Prieska–Upington section was built) some 135 000 troops and 169 000 animals were transported and 613 special military trains were run. The military use of the line continued as it advanced from Upington to Kalkfontein. Military depots were formed along the line to shorten wagon and road transport as much as possible. The five depots were at Draghoender, Keimoes Road, Lutzputs, Langklip and Nakop on the border. Second, the contribution of the line immediately after the campaign might have been even greater. After surrender of the German forces, the South African government was anxious to return its troops and war equipment to the Union. At this time, South Africa was preparing to send troops to its second campaign of World War one, this time into German East Africa (today Tanzania) which required a speedy mobilisation of men and material, mostly the same resources tied up in the GSWA campaign. The return of 26 000 troops and 60 000 animals in about three weeks was a massive operation. Lines in GSWA that normally had two trains per week, now had to handle four trains per day, forcing trains to also run at night for the first time. Some troops and supplies were returned by ship via Walvis Bay and Lüderitz, all the rest by rail via Upington.

The contemporary press freely acknowledged the railway contribution to the military campaign: "As General Manager of the SAR he [Hoy] did brilliant work in connection with the rebellion and the South-West campaign, the rapid transport of troops having much to do with the success of the military operations in both cases." (*Potchefstroom Herald* in 1916) "That Sir William Hoy well deserved the knighthood which has been conferred upon him will be admitted by all who have any idea of the immense amount of work which fell to the lot of the Railway Authorities in this country in the last sixteen months." (*Rand Daily Mail* in 1916) "The part played by the Upington connection has been of incalculable service to General Botha in the prosecution of his successful campaign." (*The Railway Gazette* in 1915)

A military historian, after studying the railway contribution to the campaign sixty years later, agreed: "The value of the Railways' contribution was immense. It was true indeed that the SAR&H rendered unique services without which the suppression of the Rebellion and the advance into GSWA would have been enormously complicated."

### Engineering excellence

The SAR, understandably, was bursting with pride after successful conclusion of its project: "Yet, despite dangers and delays beyond their control, the civilian engineers and staff of the South African Railways Administration, who planned and executed the work, carried on unperturbed, and for solid and rapid workmanship established what even under peace conditions would have been a record for South Africa, and will rank high with railway construction achievements elsewhere." … "But if, on the whole, the engineering was straightforward, the retarding circumstances under which the engineers had to work, and the rapidity with which, nevertheless, they did work, make the Prieska–Kalkfontein line one of the noteworthy feats in the annals of railway construction."

The SAR project was recognised by their fellow South African engineers when William Ingham, president of the South African Institution of Engineers, congratulated William Tippett and his engineers of the SAR. Accolades from other quarters were earlier received when the line reached Upington. At the end of the campaign, appreciation for the entire railway contribution was expressed by the Prime Minister and Commander-in-Chief, General Louis Botha: "General Botha telegraphs appreciating excellent services and sends congratulations on success attained railway construction."

### Military versus railway objectives

Most archival material paints a picture of smooth, harmonious cooperation between the railway engineers and the military commanders during the GSWA campaign. A typical example is a letter from Military Command Cape Town to General Manager Hoy: "I have to acknowledge and express my great appreciation of the most satisfactory arrangements which were made by the South African Railways in dealing with military traffic during the last four months. Particularly during the first two months of mobilisation, when it was often found necessary to order trains at very short notice, and sometimes to cancel or alter them at the last moment, was the smooth working of the system and the energy and willingness of the South African Railway officials and employees most noticeable …"

There is reason to believe that this was generally true. But it also has to be recognised that the soldiers and the engineers had different objectives, which would inevitably clash at times. A typical situation during the campaign was described by a military historian: "If a commander urgently wanted rail transport, he frequently overrode the railwaymen to get his way. Many acts of interference occurred, and rail operations during the Rebellion were notable for ill-feeling between defence and railway authorities, un-cooperation in some instances and a good deal of frustration to both parties."

Conflicts of this kind were frequent enough to prompt General Manager Hoy, after the conclusion of the campaign, to voice the frustrations from the railway perspective: "[The Department of Defence's] methods have been most exasperating at times during the past three years and have resulted in much avoidable inconvenience and expense …"

Similar frustration from a military perspective was voiced by no less than an irritated General Louis Botha, in a private note to General Smuts written at the height of the campaign on 23 May 1915: "Hoy with all his engineers has caused chaos … I have already made all sorts of plans, but it is now becoming clear to me that our forward movement is being delayed by the clumsy feebleness of engineers, and because of these Collins and Beaton [SAR engineers commanding the SAEC] should never be in such responsible positions, and I fear that Hoy listens to them too much. However, it is damned discouraging …"

Botha, in this instance, was probably reacting to a delay caused by local problems, rather than registering a general complaint about the railway engineers. These mutual frustrations were not unique to this campaign. At their core, the frustrations stem from the fundamental difference between military engineering and civil engineering. An eminent military engineer at that time encapsulated the essence of military engineering: "… the fundamental economic principle of military engineering is that time is of essence, and cost and durability of works are ordinarily matters of minor importance. The quickest makeshift is usually the best solution. Simplicity must characterise all designs. Materials which are available at or near the site must be utilised to the fullest possible extent. … The highest expression of the skill of the military engineer is this very simplicity and the rapid adaptation of his designs to the tactical requirements of the situation and to the resources in men, tools, materials and time at his disposal."

The railway engineers, however, were clearly bent on building well, and building for the future: "These railways [the lines in South-West Africa] were so designed and constructed as to be likely to be useful for commercial purposes after the war …"

#### Animal versus machine power

The construction of the rail link relied heavily on animal power – thousands of mules, donkeys, horses and oxen were used to haul water, food supplies, rails, sleepers and other paraphernalia to sustain hundreds of men in the desert, far away from any amenities. It may strike the modern reader as strange to see this heavy reliance on animal power with no mechanical assistance other than the steam locomotive. This same question was raised by someone in response to a paper presented to the South African Society of Civil Engineers (the forerunner of the current SAICE) by Resident Engineer Prettejohn in 1916. This person wondered "whether, from an economical point of view as well as from a question of rapid progress, it would not have been better to use a track-laying machine in lieu of such large gangs of natives and

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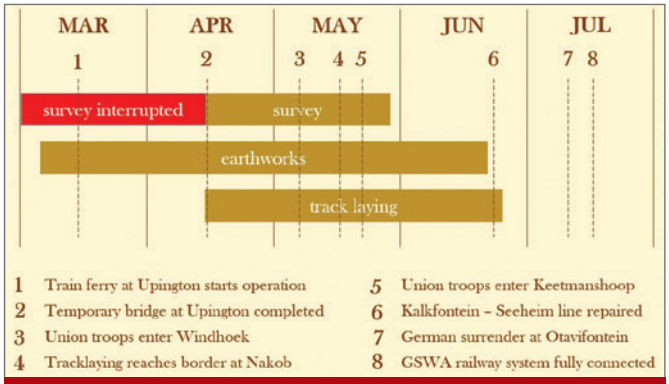


**Figure 7: Construction of the rail connection between Upington and Kalkfontein in 1915**


**Figure 8: The Boer-and-Briton cartoon from the *South African Railways and Harbours Magazine*, January 1915**

mules?" (Two such American machines were then known to be commercially available – the "Hurley" and "Harris" track-laying machines, the latter being perfected during the preceding 36 years.) Prettejohn responded that the manpower savings realised by the track-laying machines might not translate into cost savings in South Africa, the wages being lower than in America. Regarding their claimed speed of track-laying, Prettejohn would only be convinced after proved by a "lengthy trial". Furthermore, Prettejohn argued that the overall speed of construction was not limited by the track-laying, but by other factors – he stated that "there is no trouble in placing in a mile of track in favourable country, hauling both sleepers and rails with mules, in 6 hours".

[In broader context, World War One was on the cusp of the transition from animal to machine. The military campaign in GSWA hinged on both the railways, and the speedy and surprise advances of cavalry (mostly by former Boer fighters), supported by more conventional infantry and artillery – a campaign often described by military historians as the last full use of cavalry before the era of completely mechanised warfare.]

#### Contribution to nation-building

The Union of South Africa in 1914 was struggling with a process of conciliation between Afrikaners and English, very similar to our own broader nation-building efforts of today. The act of entering World War One as an active participant, at the time, was seen by some as an opportunity to unify Afrikaners and English in the face of a common enemy. More specifically, the hard work and focused effort required for the Prieska–Kalkfontein rail link was a possible vehicle for closing these divisions within the SAR, suggested by a cartoon in the SAR magazine reproduced here as Figure 8. A modern observer suggests that this did materialise to some extent: "The conquest of the new territory was part of the establishment and unification of the new South African nation."

#### Geo-political objectives

World War One came at a time when boundaries and forms of government in southern Africa were fluid. Present South Africa, Botswana, Zimbabwe, Zambia, Lesotho and Swaziland were all in the British sphere of influence; GSWA was a German colony, and Angola and Mozambique under Portuguese control. During the convention in 1908, which laid the groundwork for unification in 1910, observers from both Rhodesia and Mozambique were present. In 1922, a referendum was held in Rhodesia about possibly joining the Union of South Africa, but the option was rejected. At the time, the region was still seen to be in flux, with the possibility of a reconfiguration and/or amalgamation of states.

When England asked for South Africa's engagement in GSWA, it was limited to the destruction of the radio stations in Lüderitz, Windhoek and Swakopmund. But, it is now claimed, "the military campaign was conceptualised as a long-term territorial expansion right from its beginning in August 1914", and therefore the railway link was motivated by long-term geo-political considerations rather than military exigency. It is difficult to see how the Windhoek radio station could have been eliminated without a full-scale invasion, and equally difficult to imagine that South Africa and GSWA, whilst officially at war, could amicably share a border for four years, but that is another matter. The motivation for South Africa wanting to occupy GSWA is claimed to be the diamond deposits in the south, and the potential to resettle large numbers of South African farmers in GSWA.

South Africa's occupation of South-West Africa continued for many decades, heavily contested on international platforms during the second half of the 20th century. South Africa eventually withdrew, and Namibia gained its independence in 1989. The rail systems of both countries remain connected and the Prieska–Kalkfontein (Karasburg) rail link is still in operation, one hundred years after initial construction.

## CLOSING NOTE

The history of warfare deals mostly, and rightly, with strategy, acts of valour and other activities close to the battle lines. Limited emphasis is placed on the quiet, less glamorous contributions of those that provide the logistics and infrastructure in support of frontline activities. The GSWA campaign of 1914/15 is a good example where the construction of the Prieska–Kalkfontein railway line had been largely ignored in official accounts. A contemporary reporter said it best:

"The public thinks vaguely of columns of men marching into the enemy's country. But they know nothing … of the immense labour entailed merely in protecting these columns from hunger and thirst in a land destitute of all sustenance … This complex enterprise has been in progress for months without the general public having the faintest idea of what it entails … the transportation of tens of thousands of men and horses over the Union railways, with batteries of artillery and tons of equipment; the silent embarking of brigade after brigade, regiment after regiment; the shipping of thousands of tons of beef and mutton, flour and groceries, to say nothing of thousands of tons of forage for the horses and tens of thousands of tons of sleepers, rails, locomotives, general rolling-stock, and other material; the construction of railway lines, and the maintenance by rail, motor, and mule transport, of supply trains as the several wings of the expedition advanced …"

Modern South Africans may question the political motives and sentiments of those living a hundred years ago. We could all agree on one point, though – the construction of the rail link between Prieska and Kalkfontein represents one of the finest examples of dogged determination, urgency and engineering ingenuity in the annals of South African civil engineering.

## NICHOLAS KINGSWELL PRETTEJOHN (1872–1935)

Nicholas Kingswell Prettejohn was born in England on 13 May 1872. At the age of 14 he started his engineering studies under Professor Tweedie at the Cheveley Hall School in Plymouth. In 1888 he enrolled as a private student and pupil engineer of Professor Fairweather at Watts College in Edinburgh, where he did general railway work, survey and bridge designs. The first ten years of his career took him to Spain (construction of the 176 km railway between Algeciras and Bobadilla), Brazil (survey and construction of the Great Southern Railway from Sao Paulo to the border with Uruguay), Colombia (in charge of survey for the Antioquian Railway) and Chile (in charge of surveys for the Lunturo Nitrate Company). At the age of 26, he arrived in South Africa in 1898

to work on the new Pretoria–Pietersburg railway line, a project interrupted by the South African War in October 1899. Prettejohn joined Thorneycroft's Mounted Infantry at the start of the war as Lieutenant, and rose to Captain. He was mentioned in despatches by Lord Kitchener on 23 June 1902, and resigned on 30 June 1902 after the Peace of Vereeniging.

On 20 October 1902, Prettejohn joined the Central South African Railways (CSAR) as Divisional Engineer. From 1902 to 1911 he was posted to ten different railway survey or construction projects all over the Orange Free State and Transvaal. Soon after the CSAR dissolved into the South African Railways (SAR) after unification, Prettejohn was appointed as Resident Engineer in 1911 and continued to be involved in surveys and construction projects "too numerous to mention". From April 1913 to October 1913 he was the Acting New Construction Engineer, in other words in charge of all new lines being built. From November 1913 he was posted to take charge of the construction of the Carnarvon–Calvinia line, a task "that required special attention". In August 1914, an even greater task was laid upon him when he was appointed as Resident Engineer-in-Charge of the Prieska–Kalkfontein railway line – certainly one of the most difficult railway projects ever undertaken in South Africa which earned him a Distinguished Service Order.

After completion of the Prieska–Kalkfontein line, Prettejohn was sent to inspect the railways in East Africa, reporting to General Smuts. From here, with World War One still raging in Europe, he travelled at his own expense to London to seek a commission with the Imperial Railway Staff. This took him to France and later Mesopotamia. Back with the SAR in South Africa, he returned to new construction projects. In 1924, he was put in charge of the new narrow-gauge George–Knysna line, later our famous Choo-Tsjoe tourist line, now sadly closed. His final assignment in 1928 was as Resident Engineer New Works based in Cape Town Harbour, where he supervised the moving of the locomotive yard and running sheds from Cape Town to Salt River, the Cape Town–Woltemade line, and the breakwater extension and a new basin at Cape Town harbour itself. He retired on 1 August 1931 as Resident Engineer (Cape Town) at the age of 59 and died in 1935. At the time of his death, he was credited as "the Engineer who had built more railways in the Union than any Engineer then in the Service".

Prettejohn was a Member of the Institution of Civil Engineers in London and the South African Society of Civil Engineers. He was one of the most colourful characters of the SAR, a great raconteur who loved to regale his personnel in the evenings in the construction mess, usually with stories about his early years in South America. One of his colleagues recalled: "[Prettejohn] once kept me entertained at Carnarvon for three afternoons, without repeating himself, while we were awaiting transport for inspecting the route from Carnarvon to Calvinia …"

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