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Bridging the Empire

Construction Projects of the Gutehoffnungshütte in the Colonial
State of Cameroon (1909–1914)¹

ABSTRACT: This article proposes to take a fresh look at Germany's colonial past and its key players in order to trace the particular influence of economy in colonial contexts. It presents the Gutehoffnungshütte (GHH) as a colonial actor outside the sectors typically explored in the context of the colonial economy. GHH's prestige project of the Sanaga Bridge in the colonial state of Cameroon is used to analyse colonial networks in the first wave of globalization as well as connecting colonial projects in the metropolis with material, logistics and personnel on the ground at colonial construction sites. It traces path dependencies and competitive advantages that enabled the GHH to become a key player not just in Germany's industrialisation process, but also in the German colonisation of Africa.

Keywords: colonial history, business history, Cameroon, West Africa, industrialisation, iron and steel, labour

JEL Codes: F54, N73, N77, N83, N87

1. Introduction: First globalization and Colonial Exploitation

When the Central Railway (“Mittellandbahn”) went into provisional operation in the German colony of Cameroon in 1912, it marked the end of an era of colonial “adventures” and technical “experiments” in Africa for the Gutehoffnungshütte AG (hereafter “GHH”) of Oberhausen/Sterkrade, Germany. As one of the leading subcontractors, the company had begun to take on major bridge building projects in the German colonies from 1907/08 onwards, and by 1912 had managed, through a continuous process of trial and error, to establish itself as a key player in the colonial railway industry. At that time, on the eve of the First World War, this market was evidently only just beginning to open up to German construction and supply companies. This African “frontier” mentality led to high expectations of future colonial “development”, and hence concrete markets and business opportunities for German construction and supply companies with thousands

¹ English translation by Sharon Howe.

I would especially like to thank the participants of the panel “Deutscher Imperialismus revisited: Neue empirische Zugänge zur Sozial- und Wirtschaftsgeschichte des deutschen Kolonialismus”, at the German “Historikertag” 2023 and the participants of the colloquia at Göttingen, Leipzig and Bamberg Universities for their feedback on earlier versions of this paper. I also would like to thank the anonymous reviewers for their precise and helpful remarks.

of kilometres of track to be built in Cameroon alone.² Whereas previous research into the GHH has centred on its role in the German and European industrialisation process and its subsequent evolution into a large-scale twentieth-century concern, this paper proposes to shift the focus to its significance as a colonial actor.³

At the turn of the century, railway and road building projects in the (German) colonies in Africa were regarded as entrepreneurial “adventures” and technical “experiments”, and were described as “exotic” and “pioneering”.⁴ In the eyes of political actors, such as the Imperial Colonial Office (RKA), this policy of “railway imperialism”⁵ was a prerequisite for colonial “development” of the German “protectorates”.⁶ From 1906 onwards, such projects were not only to be promoted – especially under the newly created colonial office headed by the banker Bernhard Dernburg;⁷ they were also to be organised in an economically rational and efficient manner beyond the realm of mere ideological fantasy. Behind this agenda lays a combination of political ambitions for world power, ideological hubris and economic and civilizational notions regarding the “development” of these new colonies.

So far, research into both the ideological implications of this policy and the economic history of the empire has been slow to consider the concrete expectations, experiences and practices of those involved in executing these colonial *development concepts* “on the spot”.⁸ However, it has been amply demonstrated that there was a strong divergence at the turn of the century between political agitation, which insisted on the need for infrastructural development, and appetite for investment in Africa within the real economy.⁹ Recent studies have focussed on large-scale construction companies such as Philip Holzmann and Lenz or on the role of banks, such as the Deutsche Bank, for ex-

2 Baltzer (1916), pp. 67–77. For an overview on German rule and exploitation in Cameroon see Rudin (1938).

3 Stefanie van de Kerkhof briefly mentions the role of the iron and steel industry in colonial contexts, van de Kerkhof (2006), pp. 162 f.

For an overview of the history of the GHH see Bähr/Banken/Flemming (2008); Marx (2013). From the perspective of social history, industrial relations etc., see for example Kleinschmidt (1993); Welskopp (1994).

The company’s role in the markets of nineteenth-century Dutch colonies and in South American markets since the 1920s has also received little attention to date: see e.g. bridge delivery to Dutch India in the 1890s, Rheinisch-Westfälisches Wirtschaftsarchiv, Köln (RWWA), 130-3520/26, bridge for Dutch India, 1891 or 130-3520/76, bridge for Dutch India, 1898; 130-304014/34-35, Colonial Office Haag. 14 bridges to Bestek La. G7 na, 1902; first mention of these markets in Jakob (2021); Kleinöder (2022b).

4 See for example photo albums und photographic documentation of the railroad construction, e.g. Philipp Holzmann Bildarchiv (Berlin-Brandenburgisches Wirtschaftsarchiv e.V., online); Historical Archives Krupp (HA Krupp), WA 16 g/ 4.3/231, Collection of pictures of the Sanaga Project; RWWA, 130-3520/252-296, Album GHH in colonial state of Cameroon, ca. 1911. For a general (methodological) view of entrepreneurial and engineer’s photo albums in colonial railroad construction, see Daughton (2021), pp. 1–14.

5 See Davis/Wilburn/Robinson (1991).

6 Davis/Wilburn/Robinson (1991); for an overview of German colonialism and colonies, see Conrad (2012).

7 Barth (1995), 307 f.

8 See also Huber/Kleinöder/Krautter (2025) (forthcoming) and the studies in the German Research Network “(Post-)Colonial Business History”, DFG project number 527592545.

9 Faust (2014); Plumpe (2020), pp. 89–91; Barth (1995), pp. 305–315; Barth (1999).

ample – particularly in relation to railway building in German East Africa.¹⁰ While there are extensive records from Deutsche Bank on the financing and planning of colonial railway construction projects, the records of the (German) construction companies, which promise an insight into the entrepreneurial experience and expectations of these colonial markets, have been largely destroyed. This is true of both large-scale enterprises such as Ph. Holzmann, Lenz & Co., Arthur Koppel or MAN, and specialist firms such as the German Colonial Railway Construction and Operating Company (DKEBBG). Furthermore, government records – though more plentiful – only provide an external view of the companies concerned: in terms of their strategic expectations towards the colonial railway industry, they often remain a black box.¹¹ By contrast, the sources on the Gutehoffnungshütte housed in the Rhenish-Westphalian Economic Archives in Cologne allow rare insights into the company's executive levels and present a view of colonial markets from the standpoint of the supporting industry behind colonial development, and subcontractors in particular. The data for this contribution is based on a dense correspondence between the construction company (DKEBBG) and supplier (GHH steelwork department), and the letters between the bridge building department and its engineers on the construction sites in the colony of Cameroon are particularly illuminating in this respect. In the interest of revisiting the economic history of colonialism, this contribution proposes to take a fresh look at Germany's colonial past and its key players in order to trace the particular influence of the economy in colonial contexts and present the GHH as a colonial actor outside the previously emphasised sector of the colonial economy, namely trading firms and colonial companies such as concessionary or plantation companies.¹²

According to previous research, as exemplified by Markus Denzel's summary of the "economic record of the German colonial empire", it appears that "the colonies only played a marginal role in the foreign trade of the German empire".¹³ That said, the period of formal German colonisation was concentrated within a relatively narrow window dating from the 1880s to the First World War, when the country operated its own "protectorates" in West, South and East Africa, the Pacific and Northeast China. This highly condensed summary bases its case on the imperialistic drive for raw materials, markets and governmental trade defence instruments, and confirms the narrative of German colonisation as being detrimental to the national economy, as already established in the relevant studies by Francesca Schinzinger in the 1980s. Qualitatively, too, the overall picture presented to date has been one of "disappointed expectations"¹⁴: neither successful raw material finds and extraction nor overly large sales markets seem to have been achieved according to the import statistics, apart from alcohol, weapons

10 Inter alia Rösser (2024); Wall (2016); Barth (1995).

11 On the problematic source situation for construction companies, see also Rösser (2024), pp. 38 f.

12 For an enhanced concept of the German colonial economy, see also Kleinöder (2022a), pp. 108 f.

13 Denzel (2017), p. 156 (translation).

14 Denzel (2017), p. 160 (translation); on the concept of "expectations" in colonial contexts, see also Huber/Kleinöder/Krautter (2025) (forthcoming).

and railway components such as rails, sleepers and rolling stock.¹⁵ Elsewhere, however, rolling stock is described as a key export which was largely financed from empire subsidy mechanisms after the turn of the century.¹⁶ This state engagement in infrastructural “development” was fuelled by political, ideological, military and economic interests in conjunction with private-sector actors.¹⁷ In analyses of this concept of “development” and its necessary problematisation, we can observe the following different strands in the context of infrastructure projects:

1. The motive of raw material and market development still widely referenced to this day was the main driving force of colonial activities during an intensified phase of European competition known as the “scramble for Africa”.¹⁸ In this respect, the railway played a specific political, economic and military role that has so far been largely subsumed under the concept of “tools of empire”.¹⁹ In addition, the market-integrating effects of a railway connection in the course of the foundation of the German Empire have been repeatedly documented, most recently by Braun and Hesse.²⁰ At the time, this agenda was associated with the idea of “value extraction” (German *Inwertsetzung*, French *mise en valeur*) from the colonies, i. e. alignment with the economic needs of the European “mother countries”.²¹
2. The practical dimension of technical and geographical *development* has been frequently examined from the point of view of infrastructure building. A recent example, from a technical-historical angle, is the study by Sebastian Beese, whose title refers explicitly to “experts in development”.²² The work focuses on the colonial vision of a previously empty space to be opened up in the developer’s own interests – a policy referred to as the above mentioned “railway imperialism”.²³

The aim of this contribution therefore is to link the latest studies on colonial and imperial railway construction with research on the “first wave of globalisation”²⁴ and the role of the German empire. Recent papers on the economic history of German imperial foreign trade provide detailed data on the products and trading partners involved. The added

15 Schinzingler/Zapp (1979).

16 Denzel (2017), p. 160; Schinzingler (1995).

17 van Laak (2009); on the role of the Hamburg Chamber of Commerce explicitly, and as an example of the interdependence of economic and political interests, see Todzi (2021).

18 Dirk van Laak refers explicitly to Mommsen’s theories of imperialism in this connection, and specifically to Schumpeter and the assumption – widespread at the turn of the century – that “the process of European expansion is advancing as it were towards a market economy and competing peacefully from region to region for the best and most suitable equipment, for markets and raw materials.” van Laak (2009), p. 117 (translation).

19 Headrick (1981); a productive expansion of this concept is urged by van der Straeten/Hasenöhl (2017).

20 Braun/Hesse (2021).

21 van Laak (2009), pp. 104 f. Cf. also the alignment of the colonial economy with the needs of the “mother country”, Speich Chassé (2013), p. 115.

22 Beese (2021).

23 Davis/Wilburn/Robinson (1991).

24 O’Rourke/Williamson (1999); Findlay/O’Rourke (2009), still most pertinent for the German context: Torp (2005).

value of this research lies within the fact that it allows much greater differentiation at the level of goods or products. The results show that the empire traded with a growing number of places – notably many new and smaller ones – that were scattered around the world, and increasingly outside Europe, including various colonies and colonial empires. They show that the export of transport goods in particular, also and especially after the turn of the century, underwent a continuous process of expansion and diversification.²⁵ This appears particularly relevant from the perspective of colonial railway construction; accordingly, the present paper considers such research in relation to the opening up of new markets in the wider global context and connects it to the specific colonial situation and diversity of imperial interests in the late nineteenth and early twentieth century.

Central to this analysis are the following questions: what role did colonialism and the imperial world order play in the “German experience of the first globalisation”?²⁶ How far did the colonial economy extend – above and beyond the classical colonial enterprises arising from trade or colonial companies (such as plantations) – into the foreign trade of the German empire? How were these colonial markets perceived by the business actors? To answer these questions, we move between different perspectives, beginning with that of project planning and contracting within the empire, then moving on to the actual execution and construction work on the spot, with a focus on logistics, material and personnel, and concluding with an assessment of the longer-term impact of these activities for the GHH in terms of follow-up orders, experiences and path dependencies.

2. The Gutehoffnungshütte (GHH) in Cameroon

Cameroon was the last German colony in Africa to see the advent of a railway system. After the railway link of the Victoria plantation railway, the “Northern Railway” was the first to be built as a private line of the Cameroon railway company (from 1905); this was then followed by the construction of the “Central Railway” from 1908/1909. Both lines were built by the German Colonial Railway Construction and Operating Company (DKEBBG) based in Berlin.²⁷ The DKEBBG had already established itself as a transcolonial actor in the railway building industry since the turn of the century. Growing out of Lenz & Co.’s connections with the Prussian light railway, the DKEBBG was founded in 1904 with the specific aim of specialising in German colonial railway construction while also bringing the operation of the new lines under one umbrella. Alongside other construction companies such as Ph. Holzmann, it soon developed into a key player that went on to build most of the lines in the German colonies up until the First World War. The financing and management of the company was in the hands of a veritable who’s who of bankers, construction firms and supplier companies involved in German railway

25 Wolf/Hungerland (2021), Figures 5 and 9.

26 Hungerland/Lampe (2021), p. 335.

27 Baltzer (1916), pp. 67–78.

construction at the turn of the century.²⁸ From the planning perspective of the Berlin colonisers, this was just the beginning: according to the responsible senior civil servant at the Imperial Colonial Office, Franz Baltzer, further large-scale projects were expected right up to the outbreak of the First World War: “A good 2,800 to 3,000 km of track ought to be possible in Cameroon within the next 10 years in order to create a reasonably complete and organic railway network in the protectorates.”²⁹

As already tried and tested in Dar es Salaam in East Africa, the infrastructural development in Cameroon was to take place via the natural harbour in Douala, which Baltzer regarded as “one of the best harbours in the whole of West Africa”³⁰ and whose expansion began simultaneously with the construction of the Northern and Central railway. It was intended to serve as a key link between maritime and rail transport, both for necessary materials during the construction phase and later on, for the transshipment of raw material imports and exports. As such, the inauguration of this project was also symbolic of the future hopes the German state and German businesses placed in the colony of Cameroon (and particularly the plantations). As in the other German colonies, the aim of the Central Railway (Douala – Edéa – Nyong/Njok) was to replace the locally prevailing middleman and caravan trade and serve both the military and economic purposes of moving people, troops and raw materials around. Since the colony of Cameroon was not established as a settler colony, German interests focused chiefly on the extraction of agricultural products and resources: this was mainly in expectation of the extraction and export of palm oil, palm kernels, maize, peanuts, tobacco, cocoa or wood, but also prospectively rubber.³¹ The necessary building capital was initially estimated at 44 million marks (plus construction period interest) and was to be provided by the “protectorate bond” mechanism established after the turn of the century (based on the “railway bond” of 1908). Colonial railway construction projects were generally financed via fixed price contracts, which could reward rapid progress with bonuses but also penalise delays through monetary sanctions.³² They were accompanied by planned state subsidies (ensuring predictability for the construction companies) in the form of payment and interest guarantees formally documented in four “colonial railway bonds”.³³

28 Barth (1995), p. 314; also involved were, inter alia, the holding company AG für Verkehrswesen, the banker Carl Fürstenberg, the banker Walter Rathenau, and Friedrich Lenz. The supervisory board included various Krupp directors, among others. See Schömann (1965), p. 56 and Institut für Stadtgeschichte Frankfurt, W1-62, Nr. 651, Gründungsprotokoll der DKEBBG.

29 Baltzer (1916), p. 78 (translation).

30 Baltzer (1916), p. 75 (translation).

31 Baltzer (1916), pp. 70, 74.

For more detail on rubber as a key raw material, especially during the rubber boom after the turn of the century, see Oestermann (2022); on the caravan trade and its replacement with the colonial railway in East Africa, see Greiner (2019).

32 Stier/Krauss (2005), pp. 54 f.; on the same principle in East Africa, see Grages (n. d.).

33 See Baltzer (1916), pp. 30–34. These “colonial contracts” were later also used outside the formal colonial territories: see Rösser (2023).

However, the actual costs of the railway quickly rose to more than 57 million marks, of which around 48 million were consumed by construction alone.³⁴

There were various reasons for this: soon after the beginning of the works, for example, it became clear that, even for DKBEBBG actors tried and tested in colonial railway construction, the specific challenges encountered in Cameroon – due to the exceptional requirements in terms of excavation and bridge works coupled with a marked shortage of labour – far exceeded their previous experience.³⁵ Furthermore, the preliminary surveys and route inspections met with persistent resistance from the local population (partly in defence of the middleman trade monopoly, which the railway project was explicitly intended to destroy),³⁶ thereby prompting the German military (“Schutztruppe”) to resort to forced evacuation and expropriation along the last section of the line in particular. At the same time, there was also much scepticism within the colonial administration from the outset regarding the plans and calculations, as even Bernhard Dernburg himself was unsure of exactly what awaited the construction companies in terms of local resistance, topography, climate, and so on. Initial route surveys had already been suspended in 1902 due to strong local resistance, so the precise nature of the terrain was largely unclear.³⁷ These fears and constraints in the planning process had consequences for the participating companies later on when it came to construction, particularly in the case of large-scale bridge projects.

For the purposes of this construction project, the Gutehoffnungshütte in Oberhausen/Sterkrade acted as an independent subcontractor of the DKBEBBG in Cameroon. So far, the GHH itself has been studied chiefly as a player in Germany’s industrial history that established itself as a traditional mining and mechanical engineering company and developed through machine and steamship construction into a major industrial concern of the twentieth century. It had already begun expanding into the global bridge construction market in the 1870s, and was thus able to draw on some previous practical experiences.³⁸ The colonial contexts of its business, by contrast, have received little attention from researchers.³⁹ Yet the GHH not only supplied ready-made construction kits to the German colonies (as a simple trade transaction) in the late nineteenth and early twentieth century, but also participated increasingly in larger-scale construction projects itself by deploying its own engineers and foremen on site.⁴⁰ From the period immediately before the turn of the century, it already had close links with the construction company Lenz & Co. – a company that specialised in (international) light railway con-

34 Baltzer (1916), pp. 76 f.; for a breakdown of the costs by section, see also Federal Archives (BArch), R 8127/1498, Deutsche Kolonial-Eisenbahn-Bau- und Betriebsgesellschaft zu Berlin; Bericht über die Geschäftsjahre 1908 bis 1913.

35 See especially BArch, R 8127/1498, Deutsche Kolonial-Eisenbahn-Bau- und Betriebsgesellschaft zu Berlin; Bericht über das Geschäftsjahr 1912, p. 9.

36 For details of the “middleman trade monopoly”, see Austen (1983); Eckert (1990).

37 Schömann (1965), pp. 29–33.

38 Bähr/Banken/Flemming (2008).

39 For a basic outline of the GHH in Cameroon before the First World War, see also (Kleinöder 2022b), pp. 320 f. and questions of Skilled Labour in (Kleinöder 2022c).

40 Bähr, Banken, und Fleming (2008), pp. 71–118.

struction in the 1890s and in which the company of Fried. Krupp was also involved⁴¹ – having supplied it with several bridges between 1889 and 1892 for railway building works in Egypt, for example. Following the completion of this project, the GHH hoped for further contracts and a continuation of the construction work.⁴² Even in this early phase of its involvement in foreign construction sites, there is evidence of initial learning effects and technical adaptations to local geographical, economic and political conditions within a globalised business environment. Hence the decision to reinforce certain bridge elements in order to reduce the need to travel for long-distance maintenance work.⁴³ These ideas around simple, rationalised and largely maintenance-free structures were then duly applied to the German colonies.

2.1 Under contract: bridge construction on the Sanaga

On 29.12.1909, the DKEBBG in Berlin concluded a contract with the GHH for “[...] the project management and production of the iron superstructure of the single-track railway bridge with right-hand, downstream 1.5 m wide footpath over the southern arm of the Sanaga river for the use of the Cameroon Central Railway from Douala to Edea”.⁴⁴ GHH documents show that the companies considered for the contract were drawn from an established network of candidates who were already acquainted with each other from previous joint (colonial) construction projects. GHH’s offer had to prove itself against (international) competition during the negotiations for the bridge construction of the Otavi railway in German Southwest Africa (1903).⁴⁵ In the case of the railway project in Cameroon just five years later, bids from non-German companies are no longer mentioned.⁴⁶ By then, the circle of suppliers had already greatly diminished, and the access barriers to this German colonial railway market for outsiders were evidently far greater.⁴⁷

Following production at the GHH factory in Sterkrade, GHH engineers were posted for the first time to Cameroon in order to carry out the installation on site. At this point, the company’s role in the colonial railway industry thus shifted from a purely export-based business to one of active construction, though in a terrain hitherto wholly unfamiliar to it.

The Cameroon project was only one of a whole series of large-scale projects conducted by the GHH at the time, however. The first decade of the twentieth century marked the peak of the company’s bridge exports (twelve over 8,000 t, including the bridges over the Sanaga and the Baghdad railway, and the Hoang-ho Bridge in China,

41 Reh (1934), pp. 327–333.

42 RWWA, 130-304014/51, letter from GHH to Pelizäus, Cairo, 20.1.1892.

43 RWWA, 130-304014/51, letter from GHH to Lenz, 23.6.1892.

44 RWWA 130-304014/27, contract between DKEBBG and GHH, 29.12.1909, § 1 (translation). See also Baltzer (1916), p. 356.

45 RWWA 130-304014/26, letter from Arthur Koppel to GHH, 16.9.1903.

46 For details of the negotiations and contracting procedure, see RWWA 130-304014/27.

47 On this growing network, see also Kleinöder (2020).

comprising 4,000 t structural components alone) – a clear sign of the global context of its increasing international business. In this way, it aimed to open up other colonial and global markets for itself in due course.⁴⁸ Projects of this kind represented a growing and increasingly significant proportion of the Sterkrade plant's total annual output (not only bridge but also machine construction, etc.), which amounted to approx. 100,000 t around 1912.⁴⁹ By this time, the company had also gained experience in supplying explicitly “tropicalised” bridge structures to the colonies,⁵⁰ including thirty-three bridges for the railway line built by Philipp Holzmann & Co. GmbH in *German East-Africa* between Morogoro and Tabora (1908/09), as well as to Rio de Janeiro (1895–1898) and Buenos Aires (1903–1905).⁵¹ Moreover, it had already supplied prefabricated bridge components to the colony of *German Southwest Africa*, including, in autumn 1903, a total of sixty-eight bridges with spans from 2 to 20 metres for the Otavi railway. Once again, though, these were purely export or trade transactions which ended with their shipment from Hamburg – on the “Helene Woermann”, for example – and were merely delivered to the construction firm Arthur Koppel for subsequent installation.⁵²

Cameroon was a different matter: this was the first time the GHH assumed the entire production and assembly of the iron superstructure, the laying of the track bed and sleepers, and the application of a final top-coat. Only the track system (rails, etc.) was built by the DKEBBG itself.⁵³ The total volume of the order amounted to around 1,000 t of iron structural material and was, along with an additional charge for wear and tear of equipment and labour costs, to be reimbursed as a lump sum. With a construction time of less than a year, it was a relatively tight forward transaction that depended on the progress of the railway and was, according to the contract, to be completed by November 1910.⁵⁴ The engineers in Sterkrade were well aware even before the work began that the project would pose a structural and logistical challenge for the company, not just because of the particularly long distances involved, but also the topographical conditions (the river being over 160 m wide and approx. 26 m deep when flooded).⁵⁵ Due to the “strong current and variability of the river bed”,⁵⁶ the usual river piers could not be used

48 Stein (1951), pp. 126, 135.

49 Gutehoffnungshütte Aktienverein, Report to the Annual General Meeting 1914, p. 7.

50 A further interesting point of reference in this connection is the textbook *Tropenbahnen* by R. A. Hehl of Rio de Janeiro, which was written as early as 1902 and gives an impression of the plan to use know-how transfer in order to introduce standardised engineering expertise to increasingly globalised markets. Hehl (1902). My thanks to Michael Rösser for this reference.

The study by Hans Meyer from the same year provides a similar insight: see Meyer (1902).

51 See RWWA 130-304014/33, letter from GHH to Philipp Holzmann & Co. GmbH, 18.12.1908; e. g. RWWA 130-304014/1, Haupt & Biehn, Rio de Janeiro, 34 Bridges for the Central Railway; 130-304014/5, Argentinian Government Buenos Aires, 54 bridges for the Perico-Ledesma Railway.

52 This was followed by further deliveries, RWWA, 130-304014/26, letters from Arthur Koppel to GHH, 10.7.1903 and 16.9.1903; also memo following a personal meeting between GHH and the company Arthur Koppel on 17.7.1903 in Berlin, 23.7.1903.

53 RWWA 130-304014/27, contract between DKEBBG and GHH, 29.12.1909, § 1.

54 RWWA 130-304014/27, contract between DKEBBG and GHH, 29.12.1909 and Brunner report of 21.12.1909 on a visit to the DKEBBG on 18.12.1909.

55 Baltzer (1916), p. 75.

56 Baltzer (1916), p. 356 (translation).

and adaptations were necessary. Accordingly, a superstructure with a 160 m span and a total weight of 963 t was planned in which the track would later be suspended.⁵⁷ This was a prestigious proposal in a competitive imperial market and explains the GHH's commitment to a highly risky project: it was at that time the "longest bridge in Africa".⁵⁸ As such, the project presented a technical challenge in that the bridge was to be fully assembled in advance and then "floated" into its final position via a pontoon solution. This was a proven technique which had already been tried in bridge projects for the East African Central Railway (built by Holzmann AG).⁵⁹ In the interests of quality control and to avoid "unnecessary transport costs",⁶⁰ the finished bridge parts had to be inspected by DKEBBG representatives prior to shipping, in order to avoid having to resend any missing or faulty parts. These details alone show the logistical and time pressures involved, and hence the business risk of rising transaction costs due to factors such as lack of information, defective parts and interruptions to the precisely planned and tightly scheduled construction phases. Because of the geographical situation, hold-ups in the schedule (from notification through repeat production to re-shipment) could add up to incalculable delays to the project as a whole. Right from the preparatory stage, the GHH saw the logistical challenges of the site set-up confirmed: problems soon arose regarding the availability of space for storing construction materials and equipment and for the installation of a workshop, construction machinery, offices and accommodation for the European "officials and workers"⁶¹ since, although these things had been contractually assured by the DKEBBG, the advance planning and set-up of the site was ultimately the responsibility of the GHH itself.⁶²

2.2 On-site: material, logistics and personnel

After the conclusion of the contract, it was another two months before the technical details of execution were agreed and the necessary groundwork completed, with a GHH representative travelling personally to Cameroon to gain a first-hand impression of the terrain. The main purpose of this visit was to clarify the general conditions for setting up the building site and the locally available materials, machinery, and so on. There was already an underlying assumption at this stage that there would be further bridges to deliver and assemble as the construction of the line progressed, and suitable machinery

57 On the assembly process, see Baltzer (1916), pp. 75 f.

58 Baltzer (1916), p. 356 (translation); Hoff/Kumbier/Anger (1911), p. 117.

At the same time, however, increasing bridge spans were a widespread phenomenon associated with growing expertise since, with the expansion of infrastructure – particularly in the context of canal building – the criteria for bridge construction had changed substantially on the European continent too. Stein (1951), p. 126.

59 Baltzer (1916), p. 51.

60 RWWA 130-304014/27, contract between DKEBBG and GHH, 29.12.1909, § 13 (translation).

61 RWWA 130-304014/27, contract between DKEBBG and GHH, 29.12.1909, § 14 (translation).

62 RWWA 130-304014/27, Sommerstad report of 9.5.1910 on visit to DKEBBG from 27.4.–1.5.1910.

was therefore purchased strategically in advance, with the proviso that it would be used for further work in Cameroon.⁶³

Material and logistics

Following this visit, the initial construction plan underwent a series of changes, given that the original tender was based on information from the DKEBBG and the Imperial Colonial Office. The geographical distance involved and the specific climatic and geographical conditions on the ground resulted in gaps in the data and additional costs. Thus, it emerged over the following weeks that it would – contrary to the original plans – be impossible to assemble the entire bridge before floating it into position.⁶⁴ Instead, a partial assembly had to take place on land due to the geography of the river, followed by final assembly on the river itself with the aid of pontoons and scaffolding. Not only did this change the construction planning and scheduling, but the provision of the material posed an additional logistical challenge and financial burden; this material too was produced by the GHH, together with the shipyard and machine factory Christoph Ruthof in Main-Kastel – a specialist in pontoon construction – and subsequently shipped to the building site on the West African coast.⁶⁵ In short, there were many instances of rising transaction costs even in the advance planning stages of the Edéa bridge project, having mounted up due to geographical distance and inadequate, second-hand information.

This was a problem that was limited to the initial Sanaga contract, however, and which lessened considerably in subsequent contracts thanks to the ongoing presence of an engineer on the Cameroon site over the following months: Having a company expert on the spot allowed information asymmetries to be gradually eliminated. Nevertheless, the groundwork continued to be delayed, so that a new timetable had to be negotiated as soon as April 1910. The availability of both labour and building materials on one hand and technical equipment on the other (such as a sufficiently powerful crane system to unload the material) was still a major problem right up to the beginning of the actual construction work. The tight schedule and the need to ensure a smooth execution and seamless integration between the line sections in terms of organisation, timing and material depended on a complex web of factors including geographical distance, logistical coordination and staff communication. To make matters worse, the production process in the German Empire itself was also hampered by frequent delays. This meant that the supplier companies had to be reminded regularly by the GHH bridge construction de-

63 RWWA 130-304014/27, noted by DKEBBG, construction manager of Cameroon Central Railway, in Douala on 7.2.1910.

The GHH temporary assembly bridge over the southern Sanaga arm was redeployed by the DKEBBG on the Dibamba river, for example. See RWWA 130-304014/27, Sommerstad report of 16.11.11 on visit to DKEBBG on 13 and 14.11.1911.

64 RWWA 130-304014/27, letter from GHH to DKEBBG, construction manager of Cameroon Central Railway, Douala, Cameroon, 8.4.1910.

65 RWWA 130-304014/28, correspondence between GHH and Christoph Ruthoff, March 1910.

partment of the urgent necessity to meet deadlines in order to avoid shipping delays in particular, e. g. if a steamer to the West African coast was missed.⁶⁶ The whole operation involved an intricate network of material suppliers who were already involved in the prefabrication of the Sanaga bridge and whose components had to arrive punctually by train at the port of Hamburg in order to undergo a technical inspection and be shipped via the Woermann line by late August 1910.⁶⁷ Any delays not only risked upsetting the plans for the Central Railway bridge project: due to the various parallel construction activities in the colonies as part of the infrastructural “*development*” strategy, along with military supplies, the Woermann line was also in great demand as a regular shipping route to the African coast, especially for heavy freight. All components were shipped exclusively from factories in the German empire to the construction site in Cameroon.⁶⁸ Finally, the GHH engineer with ultimate responsibility, Ludwig Kühne, arrived in Douala at the end of September 1910 equipped with further material, tools and machinery (steam hammer and assembly crane) along with three other employees, and reached the construction site at the beginning of October.⁶⁹

Cooperation and trial and error on the spot

The interdependence of the various colonial construction sites is also reflected in the logistical challenge around the availability of large-scale construction machinery and special tools. This led to an increasing cooperation between German companies in Africa. Impacted as they were by similar problems, such as the shipping of heavy construction equipment, they began to implement shared use or passed it on from one site to another as a means of cutting costs. This situation provides an insight into the direct (transcolonial) crossover between the various sites, in terms of know-how, labour and materials: even before the work began, the GHH considered using a second-hand locomotive from the DKEBBG and sharing a compressor system with the company Krupp (which was simultaneously building a sister bridge over the northern arm of the Sanaga).⁷⁰ Due to the general shortage of special equipment and the high logistical and financial input required, arrangements were made to appropriate equipment already available to other construction sites (not just those involved in railway projects). In some cases,

66 See for example RWWA 130-304014/29, letter from GHH Brückenbau to Walzwerk Oberhausen, 14.6.1910.

67 These included companies such as the screw and nut manufacturer Brune & Kappesser, Essen (sleeper screws and studs) and the Rheinische Hammerwerke (tie rods) as well as smaller local firms such as the Draht- und Hanfseilfabrik, Drahtflechterei und Zaunfabrik, Oberhausen (wire ropes). RWWA 130-304014/29, correspondence with various subcontractors, 1909–14.

68 RWWA, 130-304014/32, letter from Woermann line to DKEBBG 23.8.1910. See also the enclosed freight lists; for more detail on Woermann, see Todzi (2023).

69 RWWA, 130-304014/27, letter from contract management of Cameroon Central Railway to DKEBBG 6.12.1910; “Baubericht der Mittellandbahn für Monat Oktober”, in: Amtsblatt für das Schutzgebiet Kamerun 3 (1910), Nr. 23, 1.12.1910, pp. 385 f., here: p. 386.

70 RWWA 130-304014/27, letter from Poirier (GHH), Berlin to bridge construction department, 15.12.1909.

these were agreed on in advance in the construction contracts.⁷¹ According to DKEBBG plans, the custom-built pontoons were also to be reused later for the Nkele bridge, where the topographical conditions were similar.⁷²

The example of the Sanaga works also provides an instructive insight into the trial-and-error nature of colonial bridge and railway construction: For the substructure and the work on the foundation and riverbed, local stones were used which were “blast-ed” from the surrounding area for the purpose.⁷³ An annotated series of contemporary pictures from the GHH’s competitor Krupp⁷⁴ illustrates the huge technical problems that arose during the work on the substructure of the parallel North Arm bridge. In 1911, for example, the foundation formwork and the piling frame were “totally destroyed by the floods [...], as we can see in the picture, the driven piles are completely crooked.”⁷⁵

Consequently, the work had to be resumed from scratch, causing a huge delay to operations.⁷⁶ The riverbed, too, had changed due to the large volumes of water from the rainy season that called for additional structural protection. All this set back the completion date significantly, extending through another rainy season and into 1912, and ultimately causing Krupp to lose its contract.⁷⁷ The level of water pressure had been underestimated and had already forced the pile walls apart, severely impairing the next stages of the process.⁷⁸ The subsequent construction work on the riverbed and the monitoring for possible changes over the rainy season dragged on into 1914. The project manager of the Central Railway (DKEBBG) updated the Douala railway commission regularly on the progress of the project and the latest soundings. The commission, for its part, insisted – no doubt in view of past experience – on regular reporting, and the governor’s office in Buea pushed repeatedly for the necessary maintenance work.⁷⁹ The plans had evidently changed since the original soundings conducted by the government architect: instead of a “continuous riverbed stabilisation”, there was to be a “riverbed stabilisation

71 See also for example construction equipment in DSWA: BArch, R 1002/2141, copy of contract between DSWA and DKEBBG on construction of the section Lüderitzbucht – Kubub, 15.1.1906.

72 RWWA, 130-304014/71, letter from DKEBBG to GHH, 6.3.1912; “Baubericht der Mittellandbahn Monat April 1911” in: Amtsblatt für das Schutzgebiet Kamerun 4 (1911) Nr. 12, 15.5.1911, pp. 252–254, here: p. 254.

73 BArch, R 1001/9647, letter from DKEBBG, contract manager of Cameroon Central Railway Douala, to Imperial Railway Commission Douala, 9.6.1914.

74 Krupp had also submitted a bid for the north and the south bridge. Due to its close relationship to Lenz the GHH anticipated a preference for Krupp, RWWA 130-304014/27, GHH Berlin to construction office Oberhausen, 22.10.1909.

75 HA Krupp, WA 16 g/4.3/231, Blatt 1 (translation).

76 “Baubericht der Mittellandbahn Monat Februar 1911” in: Amtsblatt für das Schutzgebiet Kamerun 4 (1911) Nr. 10, 15.5.1911, pp. 206–208, here: p. 207.

77 “Bau- und Sanitätsbericht der Mittellandbahn Monat März 1911” in: Amtsblatt für das Schutzgebiet Kamerun 4 (1911) Nr. 10, 15.5.1911, pp. 208–210, here: p. 209; “Baubericht der Mittellandbahn Juli 1911” in: Amtsblatt für das Schutzgebiet Kamerun 4 (1911) Nr. 19, 1.10.1911, pp. 452–454, here: p. 453; “Baubericht der Mittellandbahn Monat April 1911” in: Amtsblatt für das Schutzgebiet Kamerun 4 (1911) Nr. 12, 15.6.1911, pp. 252–254, here: p. 253.

78 HA Krupp, WA 16 g/4.3/231, Blatt 1, see also Blatt 2.

79 BArch, R 1001/9647, memo of the Imperial Governorate of Cameroon to the Railway Commissioner in Douala, c. May 1914. The works were then provisionally terminated by the DKEBBG in June 1914: see BArch, R 1001/9647, letter from DKEBBG, construction manager of Cameroon Central Railway to Railway Commission Douala, 29.6.1914.

around the individual piles only”⁸⁰. To what extent this was attributable to technical and/or financial factors is not clear. However, the correspondence shows how the construction companies and state supervisory authorities continued to conduct tests on the piles (and foundations) in a joint trial-and-error process with follow-up soundings that lasted until summer 1914, as efforts to generate their own knowledge about the actual extent of the rainy season and the associated effects on the river and riverbed progressed too slowly.⁸¹

All in all, the arrival of its own engineer shortened the information chain greatly for the GHH, which now corresponded directly with its responsible site manager in Cameroon on the details. Nevertheless, the assembly of the bridge on the southern arm again faced persistent geographical and climatic challenges, particularly rainy seasons and changes in the strength of current, width of the river, etc., which ultimately turned the GHH’s prestige project into a huge lossmaker. This was attributed not least to the difficult working conditions for all those involved in the construction work, and the general shortage of suitable personnel for the heavy work on the site, sometimes under very dangerous conditions (e.g. erecting scaffolding over the river, floating the unsecured bridge components into position, and so on).⁸²

Personnel

The measures agreed on in the contract for the recruitment and deployment of personnel and the set-up of the construction site in general are important in this regard. The contractual provisions already provide an insight into the structure of the workforce on site: notably, a distinction was made between skilled craftsmen and general labourers for the basic groundwork and ancillary tasks. The site was managed by a “technically trained representative familiar with this type of work”⁸³ sent by the GHH – in other words, one of its engineers. The contract also made allowance for the specific climatic and geographical conditions of the site, which was, moreover, in a location that was not always or not directly accessible: in order to reduce the transaction costs (especially information losses and delays), the selection of personnel was to be “such that the overall progress of the project cannot be jeopardised by the illness or death of any one individual.”⁸⁴ It was also the intention to recruit personnel locally.⁸⁵ Official data from the construction reports put the number of people working on the general railway up

80 BArch, R 1001/9647, letter from DKEBBG, construction manager of Cameroon Central Railway Douala, to the Imperial Railway Commission Douala, 25.2.1914 (translation).

81 BArch, R 1001/9647, letter from the Imperial Governorate of Cameroon to the Railway Commissioner Douala, 5.7.1914; letter from DKEBBG, construction manager of Cameroon Central Railway Douala, to the Imperial Railway Commission Douala, 29.7.1914.

82 Scarce evidence of working conditions at the bridge: e.g. photo RWWA 130-3520-294 *inter alia*. See also Baltzer (1916), p. 77.

83 RWWA 130-304014/27, contract between DKEBBG and GHH, 29.12.1909, § 10 (translation).

84 RWWA 130-304014/27, contract between DKEBBG and GHH, 29.12.1909, § 10 (translation).

85 RWWA 130-304014/27, contract between DKEBBG and GHH, 29.12.1909, § 10.

to 1911 at over 6,000, most of them contract workers and free labourers along with some craftsmen, who were required mainly for special structures such as bridges.⁸⁶

As subcontractor, GHH itself was responsible for the remuneration of the labour on the bridge structures, which was graded according to job and level of qualification, following both a racial and occupational distinction. A surviving wage calculation from 1912 for the Nkele bridge project offers an example: in this case, one senior fitter and four assistant fitters were deployed for the technical assembly and supervision (amounting to a total sum of 66 marks per day). The senior fitter received an extra daily bonus of 16 marks on top of his regular contract with the company throughout his assignment in Cameroon. This was necessary in order to create a sufficient incentive for such work among the company's engineers. Also included in the workforce were ten qualified "blacksmiths" (totalling 20 marks per day) and forty "labourers" (32 marks per day). For the scaffolding work, there were a further ten skilled workers (carpenters: 20 marks a day) and fifty labourers (40 marks), whose origins and occupations are not recorded in the sources. As evidence from other large-scale construction projects shows (such as the jetty in Lomé, Togo), most of these craftsmen were migrant labourers from the African West coast, e.g. Accra or Lagos, known as "Accra men".⁸⁷ In total, the GHH set wages at "a maximum of 2 marks a day for blacksmiths and carpenters and 0.75 for labourers."⁸⁸ By comparison: according to the data quoted by Hartmut Schömann, a contract worker (usually hired for one year) received a monthly wage of 8 marks.⁸⁹ In other words, the work on the bridge projects was much better paid than the heaviest physical work, such as track laying for example. Even given a cautious evaluation of actual payment and variations in the calculations, the list also shows that the gap between the daily rate of European skilled workers and the labourers' wages is not solely attributable to their different levels of qualification. Rather, this very low expenditure on the majority of the required on-site workforce was the means by which the GHH kept the final cost down. In addition, the company benefited from a further reduction in personnel costs due to the customary practice within colonial railway construction whereby workers were only hired for the actual period of employment. This same practice also posed an increasing problem for companies, however, in that there were never enough workers available on a permanent basis in the region – just one of the risk factors associated with on-site personnel. Furthermore, the poor working conditions and accommodation on the railway construction site led to generally high death rates (through accidents and illness), as well as rebellions against the poor conditions in the form of sabotage, absconding or non-appearance (before the end of one's contract).⁹⁰ This meant high information trans-

86 For more detail on labour relations and levels of qualification see Kleinöder (2022c); for the figures quoted here, see pp. 7 f.

87 See Kleinöder (2022c), p. 9.

88 RWWA, 130-304014/71, GHH list of anticipated wages for the Nkele bridge project, 16.3.1912 (translation).

89 Schömann (1965), p. 101.

90 Schömann (1965), pp. 96–104; for an insight into working and living conditions, especially of the indentured railway construction labourers near Njok from a Basaa perspective see Kum'a N'dumbe/Pegha/Gerda Henkel Stiftung (2018), pp. 165–167, 209–211, 218–224.

fer and training costs for the company since – although officially declared as labourers – workers could nevertheless end up performing specialised tasks in a highly complex engineering setting, so that there was a persistent need for training and instruction. As a result, the DKEBBG promised to “supply already trained workers wherever possible”.⁹¹

In response to this situation, a growing trend emerged towards the mechanisation of tasks and substitution of prefabricated components. Over time, the persistent shortage of labour became such a serious and long-term problem from a business perspective that unscheduled (technical) investments were necessary on the overall construction site of the Central Railway in order to replace human labour with machines in the interests of rationalisation. These included haulage tracks (field railway system) and the use of excavators and pneumatic riveters, as well as a further increase in prefabrication at the domestic factory “in order to reduce the amount of work on site as far as possible”.⁹²

Overall, these operations were made particularly challenging by the shortage of labour, as well as natural climatic conditions. Like Krupp, the GHH found to its cost that, in the rainy season, the Sanaga turned into a fast-flowing river. This led to delays not just for Krupp, but for the GHH, too.⁹³ The state railway commission in Douala was also well aware of this problem, but there was evidently a basic lack of personnel with suitable “African experience” to ensure adequate monitoring of the construction sites, “all the more so since dealings with the construction management require a certain amount of familiarity with the various friction points”.⁹⁴ In particular, the growing number of parallel sites and the travelling that this demanded on the part of the railway commissioner led to ever greater time pressure and the need for quick decisions.⁹⁵ The urgent (political) desire for infrastructural “development” and the rapid expansion of the colonial railway network in a climate of imperial competition led to a situation on the ground whereby both producers and the supervising state authority were faced with increasing shortages in terms of production and personnel.

2.3 Under contract: follow-up orders and path dependencies

Despite all the technical hitches, the adapted “floating-in” method ultimately proved successful for the bridge on the southern arm of the Sanaga, and boosted the GHH’s reputation accordingly. On the back of this, the company received a second contract to complete the work on the northern arm originally begun by Krupp: here too, the pre-assembled bridge was floated into the final position according to the GHH’s tried-and-

91 RWWA, 130-304014/71, letter from DKEBBG to GHH, 2.2.1912 (translation).

92 Baltzer (1916), p. 351 (translation).

93 BArch, R 175-I/729, letter from Imperial Railway Commissioner Douala, 6.11.1912.

94 BArch, R 175-I/729, letter from Imperial Railway Commissioner Douala, 19.2.1913 (translation).

95 BArch, R 175-I/729, letter from Imperial Railway Commissioner Douala, 19.2.1913.

tested principle.⁹⁶ Both bridges were then finally completed in tandem and approved for use in September and October 1912, a whole two years late.⁹⁷ Due to the domino effect of delayed operations, both construction sites had been subject to repeated enforced interruptions and repairs which ultimately mounted up to this severe overrun.

Follow-up orders

By the end of the construction period, the Sanaga bridge thus left the GHH out of pocket – a loss for which it was never fully compensated. The sources indicate a loss of 112,000 marks according to correspondence with Lenz in 1912. A compensation of 40,000 marks was then negotiated, but in the end it was deferred in favour of promised follow-up orders.⁹⁸ The subsequent negotiations with Franz Balzer from the Imperial Colonial Office and Lenz on behalf of the DKEBBG regarding the final settlement were more important from an organisational point of view than a financial one, however: Technically, the GHH had, in its own words, battled against the odds to deliver a “first-class structure” whose “external design and construction has been much acclaimed by experts particularly in view of the location.”⁹⁹ This was an endorsement that the company could use not only strategically as evidence of its expertise, for example in sales negotiations for the South American market,¹⁰⁰ but also more immediately as a lever when bidding for follow-up orders in Cameroon. Details of further bridge building projects for the Central Railway were published as early as November 1911. On the basis of the review meetings held directly between the DKEBB (represented by Friedrich Lenz) and the Imperial Colonial Office (RKA), the GHH was sent advance information on follow-up projects. Although the RKA and the construction management still blamed the delays largely on the GHH itself, the GHH hoped for a speedy exoneration following further reports from Cameroon.¹⁰¹ Building on the successful cooperation on the southern arm bridge, tenders for two further bridges with a 30 m span were to be invited without delay. In order to secure this follow-up business, the GHH representative wasted no time in using his personal contacts with the RKA and Lenz to “expedite the tendering processes so

96 RWWA 130-304014/27, Sommerstad visit report 16.11.11, DKEBBG meeting on 13 and 14.11.1911.

See also RWWA, 130-304014/27, Sommerstad report 9.3.1911 on visit to DKEBBG; report of 24.4.1911, Sommerstad meeting with DKEBBG on 12 and 13.4.1911, as well as Sommerstad visit report 19.6.1911 and letter from DKEBBG to GHH 7.7.1911.

97 Bericht über den Stand der Bauarbeiten an der Kamerun-Mittellandbahn am Schlusse des Monats September 1912, in: Amtsblatt für das Schutzgebiet Kamerun 5 (1912), Nr. 22, 15.11.1912, pp. 348 f., here: p. 348.

98 RWWA 230-304014/27, letter from GHH to Lenz & Co., 25.7.1912; meeting with DKEBBG (Lenz), 15.1.1914 and meeting with Baltzer in RKA, 17.1.1914.

99 RWWA 130-304014/27, letter from GHH to DKEBBG, 21.1.1914; see inter alia *Deutsche Kolonialzeitung* report, 19.11.1912, volume 29, front page (translation).

100 See also Kleinöder (2022b).

101 RWWA 130-304014/27, Sommerstad visit report of 16.11.11, meeting with DKEBBG on 13 and 14.11.1911. See also RWWA, 130-304014/27, Sommerstad report of 9.3.1911 on visit to DKEBBG; report 24.4.1911, meeting between Sommerstad and DKEBBG on 12 and 13.4.1911.

that we have the possibility of using our people already on the ground in Cameroon for the assembly work".¹⁰²

It is not entirely clear why the board decided to continue the project despite the risks and the loss incurred. However, the documents indicate the importance of follow-up orders and the hope of further orders by way of compensation. Moreover, the leading actors in the GHH management and design office were certain that a decisive advantage or mechanism for minimising risk had been established, that personnel and material were available on the ground, and so on. Between 1911 and 1914, numerous follow-up orders were placed with the GHH for the production and assembly of bridges on the Edéa-Bidjoka line. The tendering procedure was separate in each case, however, and was by no means a foregone conclusion. The GHH tenders were still subject to a price comparison with the competition; it did, however, have the advantage of being notified of lower bids, giving it the opportunity to improve its own offers.¹⁰³ At the same time, it strategically linked these offers to the trust placed in its previous work, while explicitly leveraging the moral pressure to make amends in the Sanaga issue.¹⁰⁴ The DKEBBG too, as contractor, evidently valued its close cooperation with the GHH and pushed for its selection even if it was not always the lowest bidder.¹⁰⁵ Nonetheless, no exclusive contracts were issued for the Central Railway as a whole, even though the GHH representatives continued to lament this to the DKEBBG until the end.¹⁰⁶

Path dependencies

Besides the previously earned trust in the competence and quality of its work, path dependencies such as direct cost advantages and time savings due to existing material availability, experienced personnel and not least topographical knowledge played a key role in securing further contracts for the GHH. In all its bids, the company repeatedly emphasised and detailed the cost advantage of re-using the same machinery and re-deploying the engineers already in Cameroon. Where necessary, it made further significant downward adjustments to its prices.¹⁰⁷ Clearly, this was not just about negotiating the best possible price for each job, but a strategic policy on the part of the representatives from the bridge construction department to secure contacts and markets in this area of business in the medium term at least, and to strengthen the company's own position in the market. After all, the Central Railway had only advanced 150 km to Bidjoka

102 RWWA 130-304014/27, Sommerstad visit report of 16.11.11, meeting with DKEBBG on 13 and 14.11.1911 (translation).

103 On the distribution of bridge projects between GHH, Gustavsborg, Krupp and Gossen, see RWWA 130-304014/71, letter from GHH Brückenbau to Kühne, 28.3.1912.

104 RWWA 130-304014/71, letter from GHH to A. Poirer, 21.2.1912.

105 RWWA 130-304014/70, letter from DKEBBG to GHH, 4.3.1912.

106 RWWA 130-304014/71, letter from GHH Brückenbau to Kühne, 28.3.1912; letter from GHH to DKEBBG, 11.2.1914.

107 See inter alia RWWA 130-304014/70, GHH tender submitted to DKEBBG, 29.12.1911.

by 1912, and the entire project was not due to be completed until 1916, so there would be plenty of other special construction projects up for grabs along the way to the end point at Mbalmayo (283 km) on the shores of the then navigable river Nyong.¹⁰⁸

From then on, the contract negotiations, production and site organisation took place within a well-established and increasingly institutionalised set of parameters, with the GHH offering the possibility of using its own personnel, scaffolding, equipment and tools for the assembly of the bridge structures. The material turnaround at the Oberhausen works became quicker and quicker, taking just four months from receipt of order, including preparation time, production and preassembly/inspection. This was a clear sign that GHH colonial railway infrastructure had – subject to adaptation to the specific conditions (particularly in terms of installation) – become a standardised series product within just a few years.¹⁰⁹ For their part, the government authorities welcomed the prospect of a smoother procedure at the failure-prone construction sites in the African colonies through the use of more “standardised types” to “make life easier in the field”.¹¹⁰

Despite all these efforts, the project as a whole remained fraught with difficulties, particularly from a logistical perspective. For one thing, the high workload of the Oberhausen rolling mills in 1912 had led to an underestimation of production time. The resulting hold-ups caused a domino effect which added greatly to the logistics costs: due to the late arrival of the material in Hamburg, the Imperial Colonial Office was unable to conduct its inspections on time, and shipments were accordingly delayed.¹¹¹ Ultimately, the GHH could not meet the agreed deadline, and the late delivery of the components halted all further progress on the line.¹¹² Furthermore, the rush to get the materials out was shown to lead to qualitative structural defects.¹¹³

Nevertheless, the GHH was eventually approached by the DKEBBG to undertake the assembly of all bridges between Edéa and Bidjoka (a total of approx. 25, with a tonnage of 7–800 t) between July 1912 and October 1913.¹¹⁴ This testifies once again to the expertise and trust gained by the GHH – in the shape of its engineer Kühne – on the basis of the successful Sanaga projects. While the persistent delays in the “extremely difficult, disputed territory”¹¹⁵ exerted a constant pressure on business relations between the GHH and the DKEBBG, it was ultimately necessary to be able to trust each other. The criticisms voiced by Lenz (for the DKEBBG) essentially concerned a chief engineer (newly) deployed in Cameroon whose work was not to the DKEBBG representatives’ satisfaction. In response, the GHH sent its seasoned engineer Kühne back to Came-

¹⁰⁸ Baltzer (1916), pp. 76 f.

¹⁰⁹ RWWA 130-304014/70, GHH tender submitted to DKEBBG, 29.12.1911 and letter from GHH to DKEBBG, 4.1.1912.

¹¹⁰ RWWA 130-304014/71, meeting report Bohny and DKEBBG / Dr. Liste and Ing. Nast Berlin 2.10.1913, report of 4.10.1913 (translation).

¹¹¹ RWWA 130-304014/70, letter from DKEBBG to GHH, 25.6.1912.

¹¹² RWWA 130-304014/70, letter from DKEBBG to GHH, 27.6.1912.

¹¹³ RWWA 130-304014/70, letter from GHH to DKEBBG, 10.9.1912.

¹¹⁴ RWWA 130-304014/71, letter from DKEBBG to GHH, 2.2.1912.

¹¹⁵ Baltzer (1916), p. 76 (translation).

room, even though it was not really convinced of the measure's necessity: "His presence will calm things down so that the gentlemen can devote all their energy to the other tasks."¹¹⁶ The DKEBBG site management in Cameroon then duly reported to the Imperial Colonial Office that it was now satisfied and no longer doubted that the project would be completed on time.¹¹⁷ This confidence in Kühne's engineering skills and his presence on site were justified both by his actions and his personal contacts on the ground. Following his arrival in Cameroon, he also quickly proved an important business representative for the GHH in Douala. The company lost no time in sending him to investigate possible new areas of business such as the landing stage in Cameroon and the extension of the Togo "hinterland railway" by liaising directly with Friedrich Lenz, who was also based in Cameroon.¹¹⁸ Previously, during his work on the Sanaga project, he had inspected the Edéa-Bidjoka route together with the responsible government architect Nast and subsequently relayed valuable information on "the local conditions at the individual bridge construction sites"¹¹⁹ to the GHH in Sterkrade, thereby enabling it to produce a relatively accurate bid for the rest of the bridge construction work.¹²⁰ Now, he was able to conduct further inspections of the marked-out route, culminating in 1913 in a close consultation with the senior civil servant Franz Baltzer, the key decision maker of the Imperial Colonial Office, and business heavyweight Friedrich Lenz.¹²¹ The presence of both men in West Africa offered an ideal opportunity for all concerned, allowing the abstract decisions made at the drawing board to be shifted to the field. A delegation consisting of Lenz, Baltzer, four government architects and GHH engineer Kühne travelled in person along the forthcoming section of the route in order to gain a joint impression of the work to be done. The representatives estimated that a further 900–1,000 t or so of iron structures would be needed just for the uphill section to the adjoining eastern regions. Lenz proved personally open to Kühne's suggestions and ready to trust his expertise, prompting the latter to report straight back to his colleagues at home: "Lenz is convinced that he is getting the best designed plans from G. H. H., since only G. H. H. has seen the terrain."¹²² This exclusive advance information supplied to the Oberhausen office gave the company a demonstrable lead in the competition for the rest of the pro-

¹¹⁶ RWWA 130-304014/71, Sommerstad report (GHH) on visit to Lenz & Co. in Berlin on 17.3.1913, report of 18.3.1913 (translation).

¹¹⁷ BArch, R 175-I/730, letter from DKEBBG to the State Secretary of the Imperial Colonial Office, 8.4.1913.

¹¹⁸ RWWA 130-304014/71, letter to engineer Kühne in Douala, 19.4.1913.

See also the joint inspection by Balzer und Lenz of the bridges of the Central Railway, documented in BArch, R 1001/9647, letter from DKEBBG, construction manager of Cameroon Central Railway to Railway Commission, Douala, 25.2.1914.

¹¹⁹ RWWA 130-304014/71, GHH tender of 2.3.1912 submitted to DKEBBG (translation).

¹²⁰ See for example detailed personnel costing for subsequent bridge construction projects as early as March 1912, RWWA 130-304014/71, GHH tender of 2.3.1912 submitted to DKEBBG and letter from DKEBBG to GHH, 6.3.1912.

¹²¹ RWWA 130-304014/71, letter to Kühne in Douala, 19.4.1913.

¹²² RWWA 130-304014/71, visit report Kühne, 15.8.1913 (translation).

jects for 1914, comprising approx. 1,200 t worth of iron bridges of between 70 and 100 m, but also a whole series of smaller ones of 30 to 40 m.¹²³

At the same time however, the GHH, as supplier and (sub-)contractor, found itself caught between the interests of the railway construction company and the colonial state officials. These conflicts invariably boiled down to the extremely difficult topographical conditions and the struggle to find a technical and financial solution for them. According to Kühne's observations, this was reflected not least in the personal relationship between the parties during their joint expedition to the remote Cameroonian forest:

The working relationship between the gentlemen from the ministry and Lenz was not a particularly good one. There was a fair amount of tension between Lenz and Baltzer, to the extent that even the tents they slept in were erected as far apart as possible. Over the past few days relations have improved somewhat, probably because Baltzer has realised that the difficulties of building a railway in Cameroon are not just confined to paper.¹²⁴

Despite all its informational advantages and trusted reputation, the project remained an economic gamble for GHH too, albeit one whose risks could be minimised by meticulous forward planning and inspections on the ground. Indeed, the presence, expertise and prior involvement of Kühne as an engineer was so important to Lenz during this period that the DKEBBG assumed over half the cost of his "outward passage in the interests of the bridge assembly operations"¹²⁵, which amounted to several thousand marks. As for GHH, this privileged knowledge and access to on-the-spot information was the real story behind its engagement in Cameroon. The company's bargaining power extended beyond its close contacts with the decision makers at the drawing board in Berlin: thanks to their involvement in site inspections and contacts in the colonies, its own construction managers and engineers in particular enjoyed a degree of influence.¹²⁶ What mattered here was not so much the fulfilment of a public contract by a subcontractor, or a (foreign trade) transaction, but rather the active shaping of colonial relationships by a number of entrepreneurial stakeholders.

123 RWWA 130-304014/72, letter from DKEBBG to GHH, 8.1.1914.

The GHH was then duly awarded the contract for four more bridges on the section between 188 und 197 km, but the shipment scheduled for the beginning of August 1914 never came to pass due to the outbreak of the war. See RWWA 130-304014/72, letter from DKEBBG to GHH, 26.2.1914 and 9.7.1914; letter from GHH to DKEBBG, 14.9.1914 and 17.12.1914.

124 RWWA 130-304014/71, visit report Kühne, 15.8.1913 (translation).

Written evidence of this can also be found in his detailed report of 1916, in which Baltzer refers explicitly to the fact that work on the Central Railway project as a whole was "progressing very slowly [...] due to the unusual construction difficulties and unfavourable labour relations". See (Baltzer 1916), p. 77 (translation).

125 RWWA 130-304014/71, meeting report Bohny and DKEBBG / Dr. Liste and Ing. Nast Berlin 2.10.1913, report of 4.10.1913

126 Pogge von Strandmann (2009).

3. Conclusion

In order to gain a fresh perspective on the social and economic history of the German colonies, three arguments have been presented. Firstly, it is important to consider the GHH not just as a key player in Germany's industrialisation process – as has traditionally been the case – but also as a key player in the colonial context. In this respect, a particularly close reading is possible thanks to a relatively large amount of source material by comparison with other companies. On the basis of these sources, it is not possible to provide an exact quantification of this business field for the GHH. What does emerge from an intensive qualitative examination of the material, however, is the importance that the actors attributed to the development of these markets in the course of internationalisation around the turn of the century. They were used as a reference for bridge building contracts in other world regions and can be read as an important part of the company's reputation building in "tropical" expertise. In particular, the example discussed shows an increasing diversification of GHH's product range within the colonial railway bridge construction market. The company began to mass-produce "standard" bridge structures for all the colonies which, following large orders from East Africa, were sold mostly to Southwest Africa (Otavi Railway) and later to Cameroon. In the case of East Africa and the Otavi Railway, they were sold as construction kits and thus mainly on a trading basis, whereas in Cameroon the company's own construction know-how was deployed. Through special colonial construction projects such as the Edéa bridge, the GHH developed its expertise and achieved a broader impact by not only selling its products but also assembling them on the spot. Over time, it earned a trusted reputation within the construction industry which enabled it to expand beyond formal colonial borders. These key factors of prestige and expansion, along with the creation of path dependencies, helped to offset what was – particularly in the early days – a high-risk, loss-making business. Selling mass-produced, identical bridges as a trade transaction was relatively uncomplicated, whereas special infrastructure projects such as bridges in Cameroon were a much more complex, trial and error affair. This was compounded by mistakes in calculating the effects of the rainy season, persistent labour shortages and delays due to recurrent technical problems such as design deviations and the construction of pontoons. The company responded with countermeasures such as mechanisation, rationalisation and strategies to improve access to first-hand information: planning shifted from the drawing board to the field. This served to reduce transaction costs and risks for the GHH, which was able to turn the strategic disadvantage of unfamiliarity with the terrain, personnel, etc. into the advantage of medium- and longer-term market access with clear expectations in terms of future (colonial) markets and follow-up orders.

Secondly, our example illustrates in turn the need to extend our concept of the German colonial economy and its associated stakeholders beyond the inner circle of "classical" players such as banks (financial imperialism), colonial companies, trade, and so on. To this end, it concretises, thirdly, the dimensions of colonial "development", drilling down beneath the ideological, political and/or military visions to the practical

trial-and-error processes and limitations “on the spot”. In particular, by contextualising our example in terms of imperial competition, we demonstrate the interplay between state and business motives and the role of prestige projects in the imperial race for colonial “*development*”. In doing so, we also address more broadly the thesis of the (economic) insignificance of the German colonial economy, by placing it systematically and from a historical economic perspective in the wider context of the first wave of globalisation. The colonial projects enabled the GHH to successfully extend its international field of business. In terms of the contemporary expectations and aspirations of the companies involved, the colonial railway market was part of, and above all, a springboard to other markets: for them, the German colonial market was neither a niche nor an unimportant intermezzo. By putting these markets and experiences, and especially networks, in a broader framework than previously, we begin to acknowledge the relevance and the impact of these construction sites, both geographically and in the wider chronology of the twentieth century.

Translation by Sharon Howe

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