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# Skilled Labour in Colonial Economies. Recruitment, Education and Employment in Construction Companies in German Colonial West Africa, c. 1902–1912

The article offers new insights into the business-historical perspective of German colonial railway construction in West Africa. Two archival case studies of German colonial railroad construction in Cameroon and Togo reveal the relationship and character of training and work in specific colonial contexts at the turn of the century. The case studies demonstrate that skills on construction sites went beyond mere questions of unskilled manual work or education. This article argues that, from a business-historical perspective, not only was the general (mass) availability of unskilled labour power crucial to infrastructural projects in the former German colonies, but also that was a substantial element of skill involved, ranging from literacy to the (technical) pre- and initial training of workers and craftsmen. Moreover, firms struggled to retain (semi-)skilled workers on construction sites for longer periods.

Colonial History; Infrastructure; West Africa; Education; Business History; Railroad History; Skilled Work

## Introduction

When the German Empire entered the imperial race in the 1880s, the importance of infrastructures in the new colonies, especially in Africa, was quickly politically discussed. Only 10 years after formal colonial rule began, the first German colonial railway ("Usambara-Eisenbahn" from Tanga to Pongwe) was opened in "Deutsch-Ostafrika" (today Tanzania, Burundi and Ruanda). Early attempts at railway building in East -Africa in the 1890s demonstrated the struggle of financing these risky and highly unpredictable projects. After years of financial negotiations, the first tracks were finally built as a private investment. Later, however, the lack of private interest had to be compensated for by state support and investment. Helped by such state subsidies, approximately 4,000 kilometres of rail were built from over the next two decades in East, West, and South-West Africa. In addition to the funding issue, there was the pressing question of who should practically do the construction. This question applied to the logistics of construction companies and the available labour force.[1] Direct recruitment and labour mediation played a crucial role in these colonial construction projects.

This paper argues that, from a business-historical perspective, not only was the general (mass) availability of unskilled labour power crucial to infrastructural projects in the former German colonies, but also that there was a substantial element of skill involved that went beyond mere education. Skilled African labour has rarely been addressed in German colonial history. Although the concept of "intermediaries" has been majorly connected to administrative and educational work, such as interpreters or clerks "as the hidden linchpins of colonial rule" (Lawrance et al., 2006, p. 4), it has not systematically been applied to the broader German colonial economy. Moreover, little is known about the relationships between and the inter-dependencies of German companies and their skilled workers on construction sites. The research focus has largely been on the power and control of labour in the most extreme and violent forms of forced labour and slavery. Following Bellucci's arguments, and in contrast to

violence and coercion, “free wage labour is controlled more surreptitiously, often with regulations presented as rational acts but always with the purpose of satisfying the needs of capital to exploit labour power” (Bellucci, 2019, p. 204; Bellucci, 2017). Therefore, this paper addresses the argument of productivity in colonial contexts and employers’ struggle “to meet industrial demand, while, at the same time, preventing workers from using their collective muscle to press for improvements in their livelihoods” (Bellucci, 2019, p. 204). How did colonial practices affect companies and labour relations retroactively in the Reich? Are debates on working conditions in the colonies and the Reich entangled? This paper sketches the current state of research regarding business, labour, and education in German colonial history. Then, two archival case studies from Cameroon and Togo reveal the recruitment, practices, and training that occurred on German colonial railroad construction sites. First, the case of the Lomé jetty demonstrates the firms’ need for skilled labour and their (economic) dependence on (local) knowledge. The second case study (Edéa -Bridge) examines the evolving question of craftsmen’s education and training in colonial contexts in formal settings (“Handwerkerschulen”) as well as training on the job. What view did employers take? What demands did they make on the various activities and specific groups of employees, such as workers, engineers, and craftsmen? How did expectations meet realities on site? Third, with the focus on construction firms and their skilled workforce, the entanglements of the Reich and the colonies in the same empirical field are examined (Cooper & Stoler, 1997).

**Business, labour, and education in German colonial (railway) history**

The history of German colonial railway construction in Africa has particularly emphasised from the employer’s viewpoint, the (problematic) mass availability of forced labourers (Schömann, 1965; Austin, 2019). Between 1909 and 1914, for example, the corporation Lenz & Co. employed a maximum of nearly 7,000 workers on the site of the so-called “Kamerun Mittellandbahn” (Cameroonian middle land railway).

At that time, a complex network of construction companies had developed in the German colonial railway construction sector, which was exclusively occupied by German companies and secured by state subsidies (Kleinöder, 2020). The colonial construction sites were a mixture of unskilled labour for earthworks and tracks, craftsmen, and a few (European) foremen and engineers as supervisors, who were provided by both the state authorities and the construction companies via subcontractors (Beese, 2021; Rösser, 2021). Studies have already revealed the working conditions at the German colonial railroads, for example, in Cameroon, which was characterised by violence, force, and coercion, with fundamental consequences for the health and physical constitution of the workers. Disease and violence were prevalent, in addition to other factors such as heavy labour, insufficient food supply, and poor housing. The construction of the Mittellandbahn alone involved more than 1,600 deaths (Schömann, 1965). The immense number of workers, including those who were sick, injured, or died, leads to research assumptions that the workers on these construction sites seemed – at first glance – interchangeable, without noticeable consequences for the businesses involved. However, when focusing on the various tasks and activities on and around the tracks, specialised construction, and the subsequent operations, the fields of activity appear more diverse than previously considered. Beyond an arbitrarily interchangeable “labour reserve”, the question of “skilled labour” (i.e. “skilled workers”) in German colonial history, such as welding, riveting, or carpentry and especially in the construction of infrastructure such as railroads, is pertinent. The relationship between education and work was a fundamental element in the recruitment and training of labour on colonial construction sites. The exemplary work of Hashemi Yekani (2019) on German colonial labour relations hints at the role the skills of the so-called “Kulis” (i.e. East Asian contract workers) played: “That many of them were trained craftsmen (and were used as such) was rarely mentioned” (Hashemi Yekani, 2019, p. 75, translation).

The narrative of a labour shortage and the consequences of a high turnover of workers are both the starting points and the reasons for this paper. This paper examines the German iron and steel industry, as well as studies on the African history of mining that have observed and described phenomena of “corporate paternalism” (Cleveland 2015; Mark-Thiesen 2018; Welskopp 1994a, 1994b). Although in completely different circumstances, sometimes the same employers dealt with similar topics regarding the “quantity” and “quality” of the workforce, such as education and vocational training, the fitness required for the industrial work processes, and the extremely mobile and “impulsive” young workers from the countryside who were brought into urban centres (Ritter & Tenfelde, 1992; Conrad, 2010). Questions regarding contracts, working regimes, and instruments of authority or power on the shop floors have equally been addressed by research on labour relations in these contexts in the Wilhelminian Era (e.g. Welskopp, 1994a). Although van den Bersselaar (2017) highlights some scepticism towards the effects of and workers’ responses to paternalistic claims in Africa in the course of the 20th century, it is worth considering that we are – in the case of German colonial railway construction – dealing with the same employers in the German Reich and in the German colonies before World War I. What is the link between workers on German production sites and the construction sites in West Africa? Are they transnational employees of the very same organisation?

Additionally, and due to the lack of a systematic overview, the understanding of formal educational systems in the German colonies remains ambiguous regarding West Africa at the turn of the century. However, to understand the individual backgrounds of education, skill, and training, it is worth considering the educational approaches and valued skills in German colonial contexts at that time. Overall, there was limited access to European-style education beyond missionary work (Mehnert, 1993; van den Bersselaar, 2019; Sebald, 1988). The German state, especially under the secretary in the Colonial Office Bernhard Dernburg, had just begun to establish a state schooling

system with a major focus on future colonial personnel. Building on missionary education in masonry and carpentry, interest emerged regarding formalised vocational education. For example, a vocational school opened in Lomé (Togo) in 1903 with 25 pupils.[2] State schools were mostly designed to train (colonial) administrative staff and craftsmen, such as “bricklayers, carpenters, locksmiths, painters etc. for the construction of administrative buildings” (Akakpo-Numado, 2011, p. 25, translation). Vocational training seems to have been less developed than general education programmes. This aspect clearly followed colonial policies and racial stereotypes: “the government only wanted to train a few local auxiliary staff for colonial administration and practical workers for the colonial economy” (Akakpo-Numado, 2011, p. 26, translation). Nevertheless, by 1911, more than 50 “schools for practical work” had been established in the German colonies, educating nearly 1,500 European and indigenous pupils.[3] Courses and schools for craftsmen were organised according to models in the Reich (e.g. “industrial schools”). These schools and courses trained and provided “skilled workers” in the colonies, such as “carpenters, joiners, bricklayers, shoemakers, locksmiths, painters, printers” (Adick & Mehnert, 2001, p. 339). To secure this “skilled” workforce for the German colonial economy or colonial administration in the long term, apprentices were contractually bound to the colonial state for future work at the start of their training, for example, a 10-year work commitment.[4] In 1910 and 1911, 40 students from a training course were hired in the service of the colonial administration in Cameroon. In Togo, there were more than 20 craft students at that time, including 14 carpenters, seven locksmiths, and two tailors. However, the major purpose of the workshops was to provide the colonial administration with furniture and work pieces.[5] The situation was different, however, regarding operations and skilled work. There is evidence of the strategic training of maintenance and operations staff in the railway workshops, with growing route networks and rail kilometres, increasing the demand for and size of this group of employees. For 1910 and 1911, the German colonial administration of Togo stated the following:

> For the enlargement of the railway workshops from Lomé station, the following were set up: 1 locomotive shed for 12 stalls, 1 massive single-storey magazine building, 1 carpentry workshop, 1 iron coal shed. Increased attention was given to the further training of coloured workers and factory staff. Six native locksmiths were entrusted with the independent management of locomotives after previous employment as stokers and after successfully passing their examinations. The trains they drive are accompanied by a European locomotive driver as a supervisor until further notice.[6]

Therefore, individual promotion and further training were possible within the railway construction and operation system.

In contrast, the basic issues of literacy and schooling were the responsibility of both the state schools run by the German colonial administration and the externalised missionary schools (Meyer zu Selhausen, 2019). In this context, “education” and “work” also contained “civilising” elements deemed essential and indispensable for developing character as noted in administrative documents, especially in “schools for coloured people”.[7] Moreover, the entangled aspects of education, civilising, and work were not in colonial contexts, but were already rooted in the foundation of industry schools in the Reich itself (Marquardt, 1975). As a “prerequisite for the introduction of the new technologies” (Wößmann, 2011, p. 43, translation), education had been interpreted as an investment in human labour since the start of (European) industrialisation. Although ambivalence remains over whether it was ever a goal to encourage the industrialisation of the colonies (Gardner & Roy, 2020), (technical) education in this context also appears to be case of investment.

**Which skills? The Lomé jetty (Togoland)**

German colonial history is generally considered as a comparatively short historical “intermezzo”, as Bismarck’s personal profiling, as a largely economic project, or as being of little economic significance in the overall balance. However, this picture

changes as an assemblage of local actors and local profiteers of imperialist power, regarding their own interests and agenda. J. Decker (2020) argues that colonial railway construction paved the way for specific and constantly contested “micro spaces”. In a newer understanding of a global history of technology, these “trading zones” not only question labour relations regarding power and contestation, but also the circulation of knowledge (Hård & Tjoa-Bonatz, 2020). The German construction sites can be considered an encounter of different forms of “skilled” and “unskilled” labour that did not always follow the paths of normative European knowledge.

Furthermore, and closely linked to these questions, is the need to engage with unique individual prerequisites regarding railroad construction sites, including “skills” such as manual and linguistic abilities, which distinguished groups of workers and forced companies to adopt different logics of action. Frankema (2012) introduces useful categories and characteristics of education in colonial contexts. In his findings, “informal spheres” and the transfer of local African knowledge contrasts and meets “formal” education approaches in colonial contexts. In this context, the range of skills and knowledge falls between “formal” and “informal”, between normative knowledge in literacy and numeracy on the one side and practical skills on the other side (Chaudhary & Garg, 2015). Both aspects were required and trained in colonial railway construction:

> October 8th. Taking further bearings. Afterwards, heavy rain. Teaching a black so-called technician to stake out straight lines and measure lengths.
> […]
> October 11th. Since the black man who knows how to write does not show any understanding of the measurements, I had to ask for his replacement, whereupon one of the black customs inspectors is put at my disposal.
> October 12th. A black private clerk, who has already been involved in construction work, is instructed by me in surveying at the same time as the customs inspector; the former shows good understanding, the latter is bearable.[8]

These excerpts are taken from an extensive self-testimonial report concerning the

preparatory work to construct a pier in Lomé, the German colony of Togo (also "German Togoland"), dating from 1897. The excerpt hints at the multi-layered structures of work and employment, as well as the formal and informal skills explicitly addressed and demanded by construction companies. The report is a collection of stereotypes and the climatic, technical, and geographical challenges facing colonial railway construction in Africa. The report contains the internal views of a German engineer, an employee of the Arthur Koppel Company, preparing and planning for railway construction in Togo. The report is shaped by the disparity between the economic and technological expectations of the business and the actual experiences of the firm's engineer in the colonial situation on site in Togo. The documents are part of a collection regarding preliminary construction work in the first phase of railway construction in "German Togoland" in 1897. These small-scale preliminary works initially failed due to a lack of investment interest by German investors. It was only after expected returns became apparent, or when, to the colonial administration, it became certain that the whole project would be self-financed, that finance was forthcoming. The railway was, thus, not built until after the turn of the century, and the jetty in Lomé was not opened until 1904 (Sebald, 1988).

The dimensions of transnational labour migration and the dependency of European companies on these "skilled workers" are evident in the case study of Lomé.[9] As Rich (2007) states, colonisers faced a vital and, to some extent, highly mobile labour market in West Africa regarding specific skills, such as craftsmanship from Ghana (Gold Coast) or so-called "Kru" sailors and workers from Liberia. For example, "Christian schools […] allowed Gabonese to enter commercial networks that pulled qualified workers into employment abroad" (Rich, 2007, p. 156). Little is known about the first generation of migrants from Sierra Leone, Fernando Po, Ghana, or Gabon from the 19th century onwards; however, European merchants, traders, and firms depended on their skills, building a niche for recruitment and employment for African agents and independent artisans (Rich, 2007; Gunn, 2021).[10]

The case study also reveals that the expansion of the railways by no means only required an arbitrarily large, exchangeable, and unskilled mass of labour force, nor were all the salaried positions occupied by Europeans. The German colonial administrative staff and construction firms minimalised their “European” staff as much as possible for financial reasons. Questions of “teaching” and “technicians”, the heterogeneity of administrative staff and skills such as “writing”, “measurements”, and former positions (i.e. work experience) in other colonial contexts are addressed in the engineers’ reports.[11] Literacy and a basic technical and mathematical understanding helped develop employment relationships beyond the status of unskilled workers and certainly within individual career and life paths (or biographies) even before the turn of the century (Lyon, 2021). These qualities were highly demanded by the operating firms, which faced a scarce German administration and population in the colonial state of Togo. Building on research findings regarding the multi-layered positions of work and employment on the plantations, language skills and literacy created opportunities for “higher” positions and internal career advancement, on which the companies depended. It was neither possible nor financially desirable to fill all these posts with German employees. As the quoted document reveals, a position as a customs supervisor could lead to other employment relationships for a Togolese.[12] Colonial history has hinted at the dependence of colonisers on local actors and elites. This factor can be applied to the very practical technical and economic aspects of craft activities, geographical knowledge, etc. on railroad construction sites. These aspects can, therefore, indicate a complex field of “politics of knowledge […], generating ‘hierarchies of credibility’ […] through which the relative value of knowledge and knowledge practices is embedded” (Harvey & Knox, 2010, p. 124).

Taking the case study one step further, to the actual construction of the jetty in 1901 and 1902 by the German production and construction firm M.A.N., Gustavsburg, similar arguments and comments to those in the report of the leading engineer of the construction site re-occurred only a few years later. The undertaking depended greatly

on local expertise and skills, such as the skilled boatmen ("Kru") of the West African Coast. The "Kru coast" was a vital area of free emigration. With their "excellent reputation as ship labour" (Clarence-Smith, 1990, p. 55), the Kru formed a "labour elite" (Lyon, 2021, p. 43; Gunn, 2021) in the German colonies of West and South-West Africa and played a crucial role in German construction in Togo. Due to the strong surf of the Togoland coast (Lomé), loading and unloading goods was a highly risky and dangerous undertaking. Cargo vessels could not approach the coastline. Goods had to be loaded onto smaller boats to overcome the surf as intermediaries between ships anchored in the roadstead and the merchants onshore. Already facing many lost goods and lives in this dangerous undertaking, the unloading of the large jetty construction parts was highly risky. Only with the help of the knowledge and experience of these skilled Kru labourers was the construction of the jetty and the following railroad tracks possible.[13] In his report, Preiss, the leading engineer of M.A.N., is ambivalent towards "skilled" labour on the construction site. He complains, like many colonial agents, about the "laziness" ("Arbeitsunlust") of the boatmen who jumped from the boats and let many of the structural parts sink, but who and without Preiss' recognition, practically swam for their lives and fled the heavy (up to 500 kg) iron parts. Preiss also expresses his disappointment with the practical "skills" of locally hired "Ewe" ("Evhe") -workers, who did not fulfil his expectations regarding the ground and construction works of the jetty.[14]

The construction of the jetty constantly faced geographical and technical problems. The workers hit a solid layer of shells at the shore, affecting the laying of the groundworks. Again, it was the "informal" skill and knowledge of the local coast dwellers that, from Preiss' viewpoint, saved time and money on the construction site. The locals dug out the shells about two metres beneath the water level before technical diving equipment arrived from Europe. From the divers' perspective, this was wearisome and dangerous work, diving constantly in the sea to perform heavy manual labour. The success of the construction site depended on and covered several areas of skill. Preiss' definition of technically and practically skilled workers thus varies

immensely, therefore, according to the dynamics of the construction and operation process.[15] Moreover, these skills were in demand for both the construction and the operation of the jetty and the connecting railway on the coastline ("Küstenbahn"). In the preliminary studies of the Lomé pier and railroad, the company Arthur Koppel estimated the need for "5 black clerks" and "60 Kruboys" for the new working conditions at the jetty.[16] As described in similar cases of Kru migration and expertise in southern Africa, the knowledge and practical experience of loading and unloading cargo, as well as in administrative positions, according to testimonial letters, were areas that could offer ongoing employment (Lyon, 2021; Gunn, 2021). Although locals were excluded from higher positions, racially motivated declassifications blurred with practical requirements at the construction site and formed their own logic of hierarchy. At the same time, in addition to their technical training, European engineers, like Preiss, found themselves in new positions of supervision and power, which, contrary to their European working worlds, endowed them with new autonomy and decision-making authority (Beese, 2021).

Technical training empirically hints at the mobility, functionality, and commodification of skills. Examples from later periods and other regions (especially British India) reveal how enterprises invested in local education and training, the long-term commitment of employees, exchange programmes, etc. At the turn of the century, however, the term "education" often appears regarding language proficiency, which was partly acquired through previous activities and employment. Language proficiency was often equated with literacy, for example, employing literate people in German plantation management as "writers" or in multiple serving household positions (Authaler, 2018). These skills were developed by acquiring empirical knowledge and practical skills, such as literacy, from employment relationships and, increasingly, because of Western missionary work. Language skills, numeracy, and literacy were considered "core competencies" by companies (e.g. for measuring in the given example of the jetty, but also enabling communication on construction sites in general).

Language skills were understood as important and were strategically used for a smooth transition from blue-collar to white-collar employment (van den Bersselaar, 2019). The picture however, remained complex, and higher positions could also lead to ambivalent situations, for example, for mediators such as intermediaries, who could be stigmatised as “instruments of colonial power and could become a focus of resentment against colonial rule” (van den Bersselaar, 2019, p. 380). Education was, therefore, largely a matter of the functional acquisition and adaptation of normative skills and knowledge by the colonisers, meaning mechanical skills increasingly became part of this “educational system”.

From the background of a global history of technology, Hård and Tjoa-Bonatz (2020) promote the concept of “trading zones” in technological construction contexts in a comparable manner to the above example. They state that, “different actors collaborate” in order “to trade information” and “to exchange knowledge and skills” (Hård & Tjoa-Bonatz, 2020, pp. 934, 949). In this context, local skills and knowledge tend to refer to practical (building) skills and artistry. The researchers’ analysis of missionary buildings also stresses collaborative knowledge and practices in construction processes. Similar phenomena are evident at the Lomé jetty. Although plans were not profoundly adjusted, local skill (diving), topographical knowledge (shells, surf, etc.), local material (woodcraft), etc. highly influenced the construction process. Although investments had been made regarding the technical demands of the construction sites and the training of skilled workers, it was also increasingly important from the employer's viewpoint to retain semi-skilled workers on the construction sites for longer periods.

**A “stable” workforce in the Cameroons? The Edéa Bridge**

> […] difficult to obtain the workers, unfavourable weather conditions and the associated state of health of Europeans and coloured people, as well as the low level of education of coloured people [...][17]

Internal company reports provide an impression of the working conditions at the construction sites of the Gutehoffnungshütte (GHH) during the construction of the bridge at Edéa in Cameroon (ca. 1910–1912). These reports offer a good understanding of the training conditions and practical knowledge of the workers. The GHH was a mining and engineering company in the German Ruhr area, dating to the St. Antony ironworks, and the first ironworks in the Ruhr area in the 18th century. The company became a "pacemaker of industrialisation" (Ralf Banken) with the help of mechanical engineering and steamship construction, and, by the 20th century, it had been transformed itself into a major industrial enterprise (Bähr et al. 2008). Constructing bridges played a central role in the GHH and became one of the important export areas of the firm from the 1870s onwards. This activity included the first deliveries overseas to places such as Brazil, Columbia, Venezuela, Dutch India and Japan. From the 1890s onwards, there was a significant expansion of foreign business, including orders to the German colonies, Egypt, and the South African Union. The GHH's business model not only included the delivery of finished bridge components, but also

> [t]he Brückenbau-Anstalt has trained personnel who have already successfully carried out foreign installations under difficult conditions. Several assemblers and supervisors, and in the case of extensive and difficult structures, a leading engineer are sent on assignment. Helpers are recruited on site as far as possible.[18]

Colonial railway construction by GHH in sub-Saharan Africa was built not only with German products but also using the company's experiences and business relationships. However, the firm was obviously either unaware or uninformed about the practical schemes of the labour market in West Africa. Based on the DKEBBG (Deutsche Kolonial-Eisenbahn-Bau- und Betriebsgesellschaft / German Colonial Railway Construction and Operating Company) GHH contract's confirmation of 1909 for the "supply" of the majority of the workforce by the construction firm DKEBBG, the

engineering office at the GHH seemed rather optimistic about hiring qualified craftsmen in West Africa.[19] According to the construction reports of January and April 1911, the level of employment for the entire Cameroon Central Railway was around 4,000 workers (based on the firm's definition), the majority of whom were contract workers (more than 2,000), around 1,000 free labourers (hired on a short-term, mostly daily basis), and around 500 craftsmen (defined by handicraft). This number grew, especially due to the increasing number of free labourers employed in constructing bridges (i.e. more than 2,000 craftsmen and day labourers) and almost 4,000 contract workers in 1911, to more than 6,000 employees on the Central Railway. In 1911, 190 "coloured" workers were employed at the construction site of the bridge at Edéa, in addition to a construction manager, a senior fitter, and six assistant fitters – of whom 100 were free labourers and 90 were contract workers. Further information regarding these workers' qualifications or origin is lacking.[20]

In contrast to the general supply of workers through the construction firm, the bridge-building company GHH was explicitly responsible for the "recruitment and housing of the black craftsmen".[21] However, arriving at the construction site, GHH's leading engineer and supervisor soon realised, the information on the topographical surroundings was incorrect, and that a skilled labour force was not readily available nor as cheap as expected. The department for bridge-building at the GHH learned (from hearsay?) that blacksmiths were mostly hired from Lagos, on the West African coast. In February 1910, the company directly asked the German Counsel in Lagos for help. The Counsel replied that blacksmiths were difficult to find, were already hired by local authorities, or were employed in "well-paid positions"[22] elsewhere. The crucial factors for the construction were the availability and the price of a skilled labour force. The competition for skilled labour was also a transnational competition, as well as between firms in the German colonies themselves.

The technically demanding, specialised constructions not only involved the mass employment of manual labourers (e.g. for earthworks such as digging), but also

precision work at dangerous heights (fig. 1). The firm's construction and progress reports offer evidence of the repeated complaints about the availability of workers, the low levels of education, and the stereotypical superstitions from the coloniser's viewpoint.[23] The reports also provide important insights into the working conditions and the workers' state of health and survival strategies on the construction sites. This narrative is also evident in research on the southern African mining industry during the same period, with employers discussing the fitness and health of "Tropical Africans" as migrant workers, especially in unskilled positions (Cobley, 2014). The documents reveal the multi-layered composition of the workforce. These layers included a few auxiliary fitters, engineers, and site managers of the bridge construction company who were specially selected from the German Reich as well as recruited migrant workers from Accra. In colonial sources and across different colonial powers, "Accra men" is a collective term for qualified artisans, "whether or not they came from that city" (Rich 2007, p. 158). These men were primarily metalworkers, as well as retrained and trained auxiliary workers, sometimes poached from competing construction companies such as Krupp or MAN: "[…] so we too, after much effort and disappointment, first had to educate a suitable group of workers".[24] Around 500 of the almost 4,000 people employed on the so-called "Kamerun Mittellandbahn" (Cameroonian Middle land railway) were craftsmen. As the evidence from the Lagos Counsel implies, colonial railroad builders were not only competing for a general labour force, but also for a skilled one. By 1886, the German tradesman and ship owner Adolph Woermann had stressed the necessity of vocational education from a firm's perspective. He also stressed the difficult dependence of German firms on Accra craftsmen, who "receive an extraordinarily high salary".[25] Therefore, Woermann pressed for the foundation of craftsmen schools to create a German colonial labour market that provided "skilled" labour. Both the amount and the price of labour were at stake. Woermann's goal was to provide a sufficient labour force by training his own skilled workers, so German companies could avoid expensive recruitment. If this approach succeeded, workers

would not only be available in sufficient numbers, but companies could also lower the wage level. In Woermann's view, labour migrants from Accra were too expensive: "the main value of this department would, in my view, be that the children would be encouraged to engage in practical positive activities from the outset and to develop a taste for real producing".[26] Economic goals and (long-term) investments in education can clearly be identified in Woermann's early arguments. Firms competed for the scarce and expensive educated/skilled/professional labour force. Hence, in 1903 and 1904, the German colonial administration reported the "successful" placement of workers trained at craftsmen schools in German East Africa.[27]

For the GHH, it was especially the technically demanding installations (i.e. the "floating" of the Edéa Bridge) that required explicit construction skills, such as riveting and welding (fig. 1).[28] Locally recruited locksmiths, however, were trained primarily on bench vices and had only just begun to acquire these skills. The report hints that on GHH construction sites, workers with (state) vocational training ("vices") were employed, but, from the firm's perspective, these workers lacked significant practical experience. In line with Mehnert's findings (1993), state-driven training for the colonial economy obviously did not meet the enterprises' requirements or necessary skills.

Moreover, and at the same time, the report also hints at the problem of high fluctuation and aspects of "Eigen-Sinn" ("self-will", Lüdtke, 1993), as well as the dangers and issues of occupational health and safety as important elements of construction work. In particular, the technically demanding moment of "floating into position" was emphasised, on which depended the economic success of the project for the company.[29] This highly dangerous undertaking frightened the workers and "[a] large number of the coloured workers who had already been trained left the construction site because their contract had expired [...], another part of them left for fear of losing their lives in the upcoming 'floating into position' moment".[30] Breach of contract appears to have been a survival strategy for employees due to insufficient safety precautions, which meant the employer again lost "skilled" workers from their

regular workforce due to dangerous and harmful working conditions. The dangerous moment of “floating” and the large construction components can be seen in Figure 1.

[Figure 1: South Bridge at the Sanaga, Cameroon, GHH construction site ca. 1911, source: RWWA 130-3520/294.]

This issue forms part of the debate regarding the development of and motivation for health and safety precautions in the Reich at that time. In contrast, there is also evidence that “European employers, who paid adequate wages and treated their workers well, had no difficulties recruiting labour” (van den Bersselaar, 2019, p. 384). Even if the GHH had been able to recruit personnel from competing firms, such as M.A.N. Gustavsburg and Krupp, and succeeded in building a good reputation, the situation on site could not ensure a loyal workforce. Instead, workers used their skills and (local) knowledge to exchange employers or to take advantage of the best possible employment for them in a proactive and highly mobile and flexible way, according to their own needs and interests regarding waged employment (Mark-Thiesen, 2012).

The GHH case study addresses aspects of work, domination, and power, but also the company’s task to retain semi-skilled workers on construction sites for longer periods and on a more regular basis. This point connects with the concept of “loyalty” and the safeguarding of entrepreneurial autonomy of action in employment policy, which were part of broader research interests in labour relations – beyond the narrower wage issue. Welskopp (1994b), for example, comprehensively examined the measurable effects of a so-called “core workforce” in the German iron and steel industry. Both sides, the African-historical and the business-historical interests, meet on the field of “humanising” colonial infrastructures “on site”. From an economic viewpoint, there is more than the history of costs and benefits in colonial economies. Focusing on the actors and the businesses involved broadens the picture of the “coloniality of the infrastructures” they built.[31] From an employer’s perspective, the

question of colonial labour relations not only concerned the availability of a mass, exchangeable reserve of labour, but also diversified activities and levels of education, ranging from literacy to the (technical) pre- and initial training of workers. Investigating these areas regarding the worker/workforce and of the firm can help to identify agency on construction sites in multi-layered ways (Thomas, 2016).

With the transfer of German training structures (e.g. the tradition of craftsmen and industrial schools), the institutionalisation of skilled worker training was established in the colonies, driven by civilisational-missionary and economic motives. In German East Africa in particular, these plans went so far that a specific "machinist school" was planned in 1913. This plan originated from the idea, and with the financing of the metal, iron and machine industry in the German Reich. The aim of this educational institution was to "supply technical operations such as railways, water and port construction, mining, inland navigation, factories with cheap coloured helpers [...]".[32] This training was not least a prerequisite for increasing mechanisation and rationalisation plans for the colonies:

> The formation of a group of cheap, local skilled technical workers and machinists created the preconditions for the increased use of machines in all works in the colony, i.e. for an ever-increasing replacement of human labour by machine labour. Thus, the machinist school will also contribute to the gradual solution of the labour question.[33]

However, such plans varied greatly from one German colony to another. At the same time as the "machinist school" was opened, according to contemporary assessments of the Governorate of Cameroon in 1913, schools for craftsmen and further education in Cameroon were still in their infancy.[34] Eventually, and especially facing issues of infrastructural maintenance and repair, colonial actors relied on African labour, and "without them, it would have ceased to function very quickly" (Edward & Hård, 2020, p. 44). By shifting the perspective from administrative employment to construction work sites and private firms, the "informal" (Gallagher & Robinson, 1953) character of

colonialism in this period is highlighted. Moreover, in the example of colonial bridge-building, local skill and knowledge were combined with Western European technological skills, and thus "[c]onstruction work was a mutual learning process" (Hård & Tjoa-Bonatz, 2020, p. 940) – in a specific colonial environment.

Overall, and from an explicit management viewpoint, the workforce in railroad construction was by no means, without exception, an arbitrarily interchangeable labour force in terms of both quantity and quality. On the contrary, the sources reveal the ways the company tried to bind the installation workers to follow-up contracts to create their own trained and permanent workforce via strategies of recruitment and education. The construction management feared the approaching rainy season, which added even more pressure to the recruitment of skilled staff. If unsuccessful, construction would have been postponed, with high monetary losses for the company. The characteristic fixed-priced contracts only secured measurable profits when projects were finished on time. Delays due to climatic changes, labour shortages, or lack of material could soon become costly without extra state compensation.[35] This situation hints, as well as the example of Lomé, at the monetary implications of the availability of and maintaining a skilled labour force, even if companies were forced to pay higher wages (Mark-Thiesen, 2012). In contrast to short-term monetary advantages, such as extremely favourable labour costs, the actors were more afraid of long-term losses due to poor work and/or regular interruptions. The companies were, therefore, keen to extend working relations repeatedly with follow-up contracts. Comparing these findings with research on the German iron and steel industry (with the same companies), it is evident there was a trained and from the employer's viewpoint, to some extent, "loyal" and thus more permanent workforce in Africa (e.g. through wages and working conditions) to avoid the negative consequences of high fluctuation or head-hunting from other corporations. This workforce was part of the same debate in the German Reich (Welskopp, 1994b), albeit filled with racist stereotypical influences.

**Skilled labour? Entanglements of the Reich and the Colonies**

According to recent studies by Authaler (2018) and Lyon (2021), dynamic forms of labour empowered workers to move within the German colonial system and to enter into employment relationships. This point has mostly been stressed for services and employment in colonial administration, but possibilities existed outside this area also (van den Bersselaar, 2019). It is important to note, however, that certain forms of elementary education were often a prerequisite for higher services. This is a shift that can explicitly be observed in the colonial context of railroad-building in German Togo and Cameroon, when the predominantly forced labour in the public construction process mixed and changed to wage labour in the transport operation and maintenance as drivers, railway and port operators and in railroad workshops. At the same time, the aims of close entanglement of workers and their labour should also be considered:

> This means that even outside working hours, life should be organised in such a way that the maximum work capacity is maintained. By encouraging workers to live in settlements directly on the plantation, preferably with their families, it was intended to prevent them from leaving the plantation before the end of their arrangements or contracts. Work and private life were thus closely linked. (Authaler, 2018, pp. 71–72, translation)

The same arguments are in Welskopp's research (1994b) on corporate social policies in the iron and steel or electrical industries of that period in the Reich. The issue is not relativising or even containing exploitative labour regimes in the colonial contexts; instead, colonialism "offered little in the way of political or civil rights to most indigenous inhabitants of the colonies, although there were some opportunities for social mobility" (Gardner & Roy, 2020, p. 69). However, these opportunities were linked to both education and health care. Economic, business, and social approaches provide a set of tools for a better understanding of these entangled histories. Nor is it an aim of this article to equate the conditions at Krupp or GHH in the Reich with those on

construction sites in Africa. Nevertheless, if one takes Sebastian Conrad's call (2010) for an "entangled history" seriously, both production and construction sites need to be considered part of the same corporate culture and debate. The corporate actors active in both regions (the planning and production in Oberhausen and the installation in Edéa), and those who shaped and influenced working relations in concrete terms (mostly engineers and foremen), directly linked corporate cultures and practices in both regions and contexts. Although Schröder (2006) reconstructed the legislative framework of German colonial labour relations in detail, he also hints at the entanglement of debates regarding the care and welfare role of employers in colonial contexts. Schröder stresses the lack of protection against child labour and of women at work due to economic interests, despite child labour being widely prohibited in the German Reich. Moreover, there are similar arguments regarding rules and practices of hygiene, such as lavatories, in a broader sense of formal labour welfare. Overall, Schröder (2006) compares the legal framework of work rules in the colonies with the status of servants and menial staff in the Reich.

Most important, and stressed in several examples, the legal and political claim and realities on the ground varied immensely. Debates in the Reichstag, as reconstructed by Schömann (1965), reveal, for example, the poor legal arrangements and administrative control were known and politically discussed. This knowledge about the economic and the legal situation leads to a highly ambivalent picture: Many enterprises and their agents resisted (e.g. against improved food supplies or housing conditions for workers) for short-term interests, but these changes would have been in their medium-term interests to attract and maintain a skilled workforce. Despite the (limited) success of control and power through company welfare mechanisms at the turn of the century, the logic of commitment through incentives and reward did not apply in colonial contexts. Coercion remained a central strategy in the "pricing" of labour, as well as racist stereotypes such as "laziness" (in the M.A.N. case), and hierarchy within the employee groups (e.g. "Kru"), which also applied to "skilled labour".

On the other hand, and in the course of time, “with the scarce supply of skilled labour, those workers with such skills became increasingly aware of being not only important but irreplaceable for employers and society at large” (Bellucci, 2019, p. 218). The companies of the colonial railway construction could not ignore this point either.

## Conclusion

Colonial railway-building involved huge construction sites with a high investment volume, a large amount of logistics, and a great demand for labour. Empirically focusing on the construction companies, it is evident that not only were large numbers of unskilled workers needed, but also considerable numbers of skilled workers. This point especially applies to highly specialised construction projects, such as bridge-building. Elements of recruitment and the availability of trained workers, as well as investment in their training, were vital for the companies. Recognisable strategies to conquer these challenges were, first, state support for vocational training through formal institutions (schools); second, practical training during employment (work experience) and, third, the targeted reduction of fluctuation (especially as a time factor on construction sites) through the contracts, wages, and working conditions, as linked to debates on industrial relations in the Reich. “Skilled labour” in the colonial context involved more than the skills acquired through formal education and training. Firms depended on (local) African work and increasingly acknowledged their expertise and were willing (but still complained) to pay higher wages. There was also a shift from one-sided racist views to economically rational considerations of performance expectations, especially regarding skilled work, and an awareness of dependence on these groups of employees, which both constantly grew within the firms.

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