# Missionaries of Modernity

## Technocratic ideals of colonial engineers in the Netherlands Indies and the Philippines, 1900-1920

Jan-Jacob Blussé

# MISSIONARIES OF MODERNITY:
# TECHNOCRATIC IDEALS OF COLONIAL ENGINEERS IN THE NETHERLANDS INDIES AND THE PHILIPPINES, 1900-1920

BY

JAN-JACOB BLUSSÉ VAN OUD-ALBLAS

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# Acknowledgements

This project began three years ago when my father Leonard recommended that I delve into the old issues of *De Ingenieur in Nederlandsch-Indië*, the periodical of the Dutch colonial engineers in the Netherlands Indies, in search of a topic for my Master's thesis. I had always had an interest in technology and the exact sciences, although my hopes of pursuing them professionally were soon dashed. Lacking a knack for mathematics, my enrollment at the physics department of Leiden University lasted only two weeks, when I traded it for a spot in the classrooms of the history department. There I would find my academic home.

In the years that followed, I gradually discovered that the separation between what C.P. Snow called the 'two cultures' – scientists on the one hand, and literary intellectuals on the other – was not nearly as wide as it is often made out to be. Using cultural history and science and technology studies, I could combine my affection for technology with my interest in historiography. Now, after three years of reading and writing, the long road towards completing this thesis has come to an end. Along the way I built up many intellectual debts, which I hope I will someday be able to repay. Until then, I can only hope that my expressions of gratitude for the support I received during my academic journey will suffice.

First and foremost I would like to thank my parents, Leonard and Madelon, for their unwavering expressions of support. With myself being more of a talker than a writer, they witnessed firsthand my grueling labors when I tried to commit my thoughts to paper over the course of these years. Their steady supply of comments, corrections, suggestions, and additional literature helped me ground my ideas and put them in writing.

I want to express my heartfelt thanks to the instructors at Rutgers University, where I spent a year from 2009 to 2010. Michael Adas has been an enormous source of inspiration for me, both through his books and the many hours I spent in his class and at his house talking and thinking about the historical practice. At his home in Highland Park I met him and Jane regularly to discuss the direction my research was taking and the possibilities of continuing a career in academics. His patience, and his confidence that I could make my ideas work, were of immeasurable value at those times when my anxieties about grappling with the difficulties of my studies threatened to get the better of me. I could not have wished for a better supervisor for my thesis. Bonnie Smith, Paul Israel, and Seth Koven have also had a tremendous influence on the direction my studies would take—a path that has served me well, and I thank them for their contributions to shaping my ideas.

I also owe a debt of gratitude to Thomas Lindblad, who supervised my thesis in the Netherlands and watched it steadily develop in directions very un-Leiden-esque. The intellectual legacy of my year in the United States is clearly reflected in my writings, and Thomas gave me the freedom to keep developing my thesis in that direction. His positive evaluations of my work motivated me to make the most of the intellectual perspective I gained at Rutgers.

Finally, I would like to thank two other, though unwitting, contributors to Missionaries of Modernity. First, Miles Davis for his record *Kind of Blue*, which over the course of the hundreds of times that I played it, helped me sharpen my wits and focus on the task at hand during the lonely hours behind the computer screen. Second, David Sedaris, whose writings about the curious aspects of human nature helped put my mind to rest after burning the midnight oil. They were pleasant companions in the final leg of my journey. Having arrived at my destination, I must emphasize that, naturally, any mistakes in the work that lies before you are only my own.

# Introduction

## "Java"

In June of 1916 G.G. Stroebe, hydraulic engineer of the Bureau of Public Works in Manila, traveled to the island of Java in the Dutch East Indies on a short trip. Upon his return to the American colony he submitted a ten-page trip report to the Bureau's *Quarterly Bulletin* in which he presented its readers with his impressions of the island. He covered topics such as the broadening of education by the Dutch colonial authorities to a small but growing share of the indigenous population and more technical matters such as the construction methods used for the new deepwater port at Soerabaia. But he was most impressed by the vistas afforded him when he traveled through the countryside, and he supposed that many would agree with him: travelers, he thought, could not help but be amazed by the intensive tilling of the soil and the wide variety of cultures grown—ranging from sugar, tobacco, and rice, to hemp, kapok, and rubber. In fact, the exemplary state of agricultural activity on Java was what drove him to submit his article to the *Bulletin*. As he put it, the island's "object lessons, especially in agriculture and irrigation, […] for the traveler are so evident and numerous that a recital of some of the impressions created by the journey may be of benefit to readers residing in other tropical lands."[1] He approvingly cited the title used by the celebrated contributor to the National Geographic Eliza Ruhamah Scidmore for her 1897 travelogue *Java: Garden of the East*, finding it an apt description for the source of the island's wealth.

The fruits of Java's garden were not always as bountiful as Scidmore or Stroebe perceived them to be. The Demak regency, located in central Java, had been struck by deadly famines several times. Between 1848 and 1850 four successive crop failures had reduced the population by almost a third,[2] and another severe famine afflicted the area in 1872. But even as recently as 1902 – in the period that separated the accounts of the American geographer and the engineer – the inhabitants of Demak faced the specter of hunger.[3] Somehow Stroebe was blind to this event which was so grave that it had shaken the Dutch administration of the colony to its core and led to feverish debates on how to prevent future subsistence crises in the

[1] G.G. Stroebe, "Impressions from a trip to Java," *Quarterly Bulletin of the Bureau of Public Works* 5, no. 3 (October 1st 1916): 2-12, 2.
[2] C. Fasseur, *The politics of colonial exploitation: Java, the Dutch, and the Cultivation System*, trans. R.E. Elson (Southeast Asia Program, Cornell University, 1992), 113.
[3] Wim Ravesteijn, "Irrigatie en koloniale staat op Java: de gevolgen van de hongersnoden in Demak," in *Jaarboek ecologische geschiedenis* (Gent: Academia Press, 1999).

area.[4] It is ironic that the words used by Scidmore in the preface to her book on Java to describe the magic of Java can also be read as a warning against its rosy portrayals: "Myths and legends and fairy tales grow with tropic rankness in those far ends of earth even to-day, and gravitate inevitably to the stranger's ear."[5]

Why was Stroebe unaware of the hardship endured by Java's "gardeners"? Throughout his article he displayed a familiarity with the climate of the colony, knowledge of the long history of the Dutch presence in the archipelago which dated back to the East India Trade, and a keen insight into the workings of Dutch colonial rule. His use of economic data, gleaned from budget reports compiled by the bureau of public works in "Netherlands India", reveal him to have been a diligent inquirer, so that that he can hardly be accused of a lack of interest for the subject matter. Nor was he entirely uncritical; in his remarks on the school system he rendered harsh judgment on the lack of attention given to athletics in the Dutch schools, and the sanitation system struck him as underdeveloped in comparison to the works in the Philippines.[6]

Stroebe's depiction of Java as a garden of plenty despite the evidence that the reality of the island could not live up to this image can be better understood when several other factors are taken into consideration. First, regarding his impression that the "garden" was well kept: due to his occupation as a hydraulic engineer, the extensive irrigation works erected by the Dutch colonial authorities would naturally have caught Stroebe's eye. Furthermore, judging from his report it appears that the Dutch gladly catered to the American visitor's interests by taking him on a tour to several important irrigation works.[7] The Dutch on Java had every reason to protect the carefully nourished image of the island's agricultural wealth, as they presented it as the product of their engineering achievements and as evidence for the success of their rule. The influence of the Dutch reached beyond Stroebe too: R.A. van Sandick, who had been a hydraulic engineer in the Dutch East Indies between 1879 and 1884 before returning to the Netherlands, is thanked in the preface to Scidmore's 1897 book as having provided her with valuable stories on the past and history of Java—the "myths and legends and fairy tales" mentioned before.[8]

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[4] Wim Ravesteijn, "Irrigation development in colonial Java: the history of the Solo Valley works from a technological regime perspective," *International Journal of Technology, Policy and Management* 2, no. 4 (2002): 361-386.
[5] Eliza Ruhamah Scidmore, *Java: The Garden of the East* (New York: The Century Co., 1897), ix.
[6] Stroebe, "Impressions from a trip to Java," 5, 8.
[7] Ibid., 9.
[8] Scidmore, *Java: The Garden of the East*, xviii.

But there is reason to believe Stroebe was not an unwitting purveyor of this positive image of Java. He had an agenda of his own, as did his employers and the editors of the *Quarterly Bulletin*. What they all shared was a growing interest in the application of irrigation technology in the Philippines, an interest that had been developing over the course of several years. A departing director of the Bureau of Public Works (BPW) in Manila had visited several colonial holdings, including Java, in 1909 to compile reports on the irrigation techniques used there,[9] and in 1912 the newly instituted Irrigation Council met for the first time to discuss the creation of new legal frameworks to improve water management in the Philippines.[10] After the spectacular failure of the BPW's first large irrigation project in 1911[11] the Bureau's irrigation division was completely reorganized in mid-1912 by W.L. Gorton, an experienced irrigation engineer and a recent arrival to the archipelago,[12] under whose direction a new project of significant cost immediately commenced.[13]

This new dynamism also found its way into the pages of the *Quarterly Bulletin*. In an article appearing in 1913 under the title "Why irrigate?" the author argued that sufficient funds should be made available for the implementation of an ambitious irrigation policy, so that the Philippine islands would be able to produce enough food locally to meet demand and make imports unnecessary. Again, the Javanese example was cited: with a smaller areal and a larger population it was portrayed as self-sufficient[14]—and again, this was contrary to the actual situation: Javanese agriculture had in recent years been unable to meet the growing food demands of the population and was forced to resort to imports.[15] Acting director of the BPW C.E. Gordon opined in the opening editorial of an issue that appeared exactly a year before Stroebe's trip report that of all the public works operations in the Philippine islands, "perhaps the most backward are those appertaining to irrigation development."[16] He attributed this in part to a lack of long-term planning, pointing to the practices on Java where Dutch

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[9] United States. Philippine Commission and U.S.P. Commission, *Report of the Philippine Commission to the Secretary of War, 1909* (Government Printing Office, 1909), 141.
[10] United States. Philippine Commission and U.S.P. Commission, *Report of the Philippine Commission to the Secretary of War, 1913* (Government Printing Office, 1913), 212.
[11] Warwick Greene, "Annual Report of the Director of Public Works, 1911," (Manila: Bureau of Public Works, 1912), 35.
[12] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1912* (Government Printing Office, 1913), 148.
[13] The estimated expenditure for the project was 800,000 pesos, a significant sum considering the Bureau's annual budget of 10 million pesos. Greene, "Annual Report of the Director of Public Works, 1911," 12, 40.
[14] A.H. Sjovall, "Why irrigate?" *Bureau of Public Works Quarterly Bulletin* 2, no. 1 (April 1st 1913): 45-48, 48.
[15] D.H. Burger, *Sociologisch-economische geschiedenis van Indonesia* (Landbouwhogeschool, Afd. Agrarische Geschiedenis, 1975), 41-45; J.J.P. De Jong, *De waaier van het fortuin: van handelscompagnie tot koloniaal imperium : de Nederlanders in Azië en de Indonesische archipel, 1595-1950* (Sdu, 1998), 425.
[16] C.E. Gordon, "Irrigation," *Quarterly Bulletin of the Bureau of Public Works* 4, no. 3 (October 1st 1915): 2-3, 2.

engineers collected hydraulic data for a minimum of five years before committing resources to the construction of irrigation works. The Philippines could only reap the rewards that irrigation promised to provide if the engineers of the BPW were equipped with the resources to adopt such a long term vision for the American colony.

In the imagination of the American engineers working in the Philippines the irrigation practices on Java were therefore an example clearly worth following, even as their perceptions of the island sometimes conflicted with reality. "Java" became a rhetorical trope as much as a practical example. The question thus becomes to whom the rhetoric of these engineers was directed. Helpfully, the *Quarterly Bulletin* reiterated its fourfold mission on the top of the first page of every issue: "(1) To show each engineer and employee the work of the provincial division as a unit, (2) To show him that his work is a unit part of the whole, (3) To make the work of the Bureau of personal interest to him, (4) To make clear to every provincial and municipal official, and to the people, the work being done by the Bureau."[17] In other words, the publication was a media conduit for the Bureau and its members that was used to improve unit cohesion while simultaneously propagandizing the achievements and the ambitions of the colonial engineers to a wider audience. Both the propaganda and the ambitions of the colonial engineers in Philippines and the Netherlands Indies will be at the heart of this investigation.

[17] *Bureau of Public Works Quarterly Bulletin* 1, no. 1 (April 1st 1912): 1.

## Rhetoric, ambition, technocracy

As outlined above, the *Quarterly Bulletin* served as a valuable platform for engineers in the Philippines to express their ideas, and allowed them to insert themselves into the political debate on colonial policy—in this specific case the debate on improved irrigation works. But the ambitions of the engineers went well beyond the mere shaping of specific colonial policies. Owing to their technical training, engineers believed themselves to be the wielders of an esoteric knowledge: they possessed a deeper understanding of the role that the rapid progress of technology had come to play in the shaping of society. Engineers used this knowledge to claim that they held the keys to social progress: as industrializing societies were confounded by the challenges of modernity, many engineers would confidently assert that under their direction the world could be led to a triumph of rationality and progress.

In the colonies, where indigenous societies were perceived by the Western imperialist powers as "backwards" and "primitive" and technology as absent, the judicious application of the engineers' esoteric knowledge appeared to hold even more promise. As the story of "Java" shows, engineers believed that the mass construction of technological artifacts under their direction could vastly improve the lives of indigenous peoples and change society along with it. Engineers exerted such great influence in the colonial administration of the Netherlands Indies in the early twentieth century that the sociologist J.A.A. van Doorn has asked whether their control over policy-making constituted a form of technocracy: a society where absolute confidence is vested in the possibilities that technology create and where the possession of specialist expertise is the defining measure for the legitimacy of an individual's policy proposals.[18] Such a technocratic society would be guided by engineers who applied technological solutions to problems, as opposed to the legalistic methods of the existing ruling caste of lawyers, whose administration – in the eyes of the engineers – had brought progress only at a glacial pace.

Crucial to Van Doorn's vision is his belief that the engineer had emerged from a new era in technological development. No longer a tinkerer using the tools of day-to-day life, the engineer had become a man of science who reasoned in the abstract. The products of their

[18] J.A.A. Van Doorn, *De laatste eeuw van Indië: ontwikkeling en ondergang van een koloniaal project* (Amsterdam: B. Bakker, 1994), 157. He first presented his ideas at the Anglo-Dutch Conference on Comparative Colonial History held in Leiden on September 23-25, 1981. J.A.A. Van Doorn, *The engineers and the colonial system: technocratic tendencies in the Dutch East Indies* (Rotterdam: Comparative Asian Studies Program, 1982).

creativity stood in a new mental "domain."[19] In the context of the Netherlands East Indies this status of the engineer as a "technologist" could be contrasted with the more down to earth attitudes of his colleagues at the Department of Agriculture who mingled with the local population to disseminate new methods for agricultural production.[20] Suzanne Moon has pushed back against the distinctions drawn by Van Doorn, arguing that technology – even when it became ever more complex and unintelligible for those not inducted into the ranks of engineers – cannot simply be extricated from the larger social context it originated from. In her study of the operation of the Indies' Department of Agriculture she downplayed the political power of the irrigation engineers in the Dutch colony, and revealed that the progress made by the Department of Agriculture in the Indies' farm sector was also "technological" progress in every sense of the word.[21] She concluded that this increasing reliance on technology for development was not an indicator of technocracy because the Dutch political debates on what direction development should take in the colony had not died down, nor had policy-making fully come under the control of privileged experts. Instead these experts were embedded within the bureaucracy of an expanding colonial state apparatus.[22]

The growing arsenal of powerful technologies that the colonial state had at its disposal eased its efforts to reshape the environment, economy, and society of the colony. But the technological asymmetry between the colonizer and the colonized also formed the bedrock of Dutch belief that their rule over the subordinated peoples in the archipelago was legitimate. In the nineteenth century Dutch society had been drastically reshaped by technologies such as steam engines, the telegraph, sanitation, and railways. These technological achievements, which were considered the products of a superior Western rationality and scientific mindset, became the hallmarks of "civilization"—and the absence of the former implied an absence of the latter. But this sense of superiority did not breed complacency—it became a call to action: it gave birth to the "civilizing mission." This ideology mandated that those who were in possession of "science" and "rationality" venture out into the world and use them to spread "civilization" to all corners of the globe. The Netherlands were far from alone in developing such an ideology. In France and in Britain colonial expansion was supported with reference to their respective *mission civilisatrice* and "White man's burden", in the words of Kipling.

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[19] Van Doorn, *De laatste eeuw van Indië*, 123.
[20] Ibid., 148.
[21] S. Moon, *Technology and ethical idealism: a history of development in the Netherlands East Indies* (Leiden: CNWS Publications, 2007), 6.
[22] Ibid., 23.

The civilizing mission was first comprehensively studied by Michael Adas, who traced its origins to the activities of earlier Christian missionaries. In the course of the nineteenth century many of the evangelizers came to discern a clear link between Christianity and the production of superior technology; spreading the gospel in their eyes therefore did not only offer salvation to heathens, but also instilled them with values such as rationality that would allow them to practice science. At a later stage Christianity was decoupled from technology, and the gift of science was enough to inspire missionary zeal in the Europeans. Against previous historiography, which had often portrayed the civilizing mission as opportunistic and self-serving rhetoric used by the colonizers to veil their naked lust for wealth, power and domination, Adas showed that the mission was rooted in Europeans' "radically new way of looking at the world and organizing human societies."[23] To advance a society – to create "civilization" – scientific norms had to be disseminated to its members. The supporters of the civilizing mission regarded it as the destiny of the Europeans to disseminate those norms, and imperialism was a means to that end.[24]

The civilizing mission was also a familiar ideology for the American engineers populating the pages of the *Quarterly Bulletin*. In words reminiscent of Van Doorn, who had described the Dutch East Indies as a "colonial project" geared towards the reshaping of indigenous society,[25] Adas suggested that the period of American rule in the Philippines "can best be understood as a vast engineering project."[26] Engineers were as prevalent in the administration of this American archipelago as they were in the neighboring island chain under Dutch rule. In the Philippines they contributed more to the shaping of the civilizing mission than any other bureaucratic caste, and their strategies for the uplift of the Filipino population were welcomed by governors who admired their scientific calculus and technology-driven optimism.[27] In many ways, the image of the engineer was the polar opposite of the reigning perception of the Filipinos: the rationality, empiricism, expertise and boundless ambition of the technological expert stood opposite the backwards, superstitious, and static attitudes of the indigenous population.[28]

This study contends that American colonial engineers in the Philippines, and their Dutch colleagues in the Netherlands East Indies, carefully nourished such an image of

[23] Michael Adas, *Machines as the measure of men: science, technology, and ideologies of Western dominance* (Cornell University Press, 1990), 209.
[24] Ibid., 210.
[25] Van Doorn, *De laatste eeuw van Indië*, 83.
[26] Michael Adas, *Dominance by design: technological imperatives and America's civilizing mission* (Belknap Press of Harvard University Press, 2006), 144.
[27] Adas, *Dominance by design*, 146.
[28] Ibid., 155.

themselves as both the arbiters of what policies constituted the civilizing mission and as the paragons of the rational and scientific norms that the mission hoped to instill in the colonized subjects. Owing to their scientific training and technological acumen, many of them thought of themselves as the ultimate authorities within the bureaucracy on how to efficiently organize the colonial administration. Focusing on the period between 1900 and 1920, I want to show that their efforts to control the content of the civilizing mission and their attempts to become a powerful professional class in the political structure of the colony are best understood when seen through the lens of their technocratic aspirations.

The technocracy concept holds merit despite the reservations expressed by Suzanne Moon. Although she correctly noted that the engineers failed to achieve political dominance and erect their hoped-for technocratic social regimen in the colonies, her focus on the outcomes of the high-level political debates renders the activism of the engineers largely invisible. When the perspective is focused on the grassroots campaigns and strategies of the aspiring technocrats amongst the engineers, however, it becomes possible to distinguish a period in which the eventual success of those efforts appeared to them as a very real possibility. The colonial society they envisaged will be reconstructed in these pages by turning to the publications and a variety of other media and PR outlets used by the colonial engineers.

Central to my argument is the insight that the colonial states in the Philippines and the Netherlands East Indies were not monolithic entities, but consisted of various pressure groups that pursued their own agendas.[29] Each of these groups attempted to gain support for their position through the production of discourses that explained and legitimated their demands. The engineers were no different. Their discursive productions exuded a determined confidence in their own capabilities and were used to convince their audience that engineers were deserving of a privileged (or even controlling) position in the colonial state. This led them into coalitions and conflicts with a variety of other actors, such as commercial entities, the metropole, and the established members of the bureaucracy. The pluralism of the practical realities of American and Dutch empire will be on full display throughout the analysis of these discourses.

The understanding of these discourses used here owes much to the methodology used by Gail Bederman in her study of the functioning of “civilization” discourse in the United

[29] F. Cooper and A.L. Stoler, "Between Metropole and Colony: Rethinking a Research Agenda," in *Tensions of empire: colonial cultures in a bourgeois world*, ed. F. Cooper and A.L. Stoler (University of California Press, 1997), 1-56.

States between the last decade of the nineteenth century and the entry into the First World War. Her reading of the discourse concept allowed for the ideas and practices contained within it to be "multiple, inconsistent, and contradictory."[30] This methodology acknowledged that discourses could be adapted by their users to fit different situations, making the historians' efforts to reconcile these divergent applications futile. The discursive productions used by the colonial engineers were as plural as the imperial reality they lived in. The focus will therefore be on identifying the keywords within those discourses – as has been done with the example of "Java" above – to establish the common vocabulary that the civilizing mission discourse of the engineers was built upon.

The reason that engineers could entertain the notion that they might become the predominant administrative grouping within the Philippine and Dutch East Indies colonial societies was their sudden emergence as an influential profession in the economies and societies of the Netherlands and the United States. As their numbers increased, and as the results of their reshaping of the public space in these countries became ever more readily visible, engineers sought a social status commensurate to their perceived importance to industrial society. They presented themselves as the ideal of the new middle-class: educated, rational, and progressive. It can be adduced from the adoption of their rhetoric into the common parlance of broader society that the self-representations of the engineers as experts deserving of greater political power were persuasive. But the engineering profession's claim to authority ran counter to the democratic reforms in the Netherlands and the United States that broadened the political base, and that made votes rather than expertise the paramount factor in the political arena.[31] No such tension existed in the colonial space, where democracy was absent. It was on the back of the experiences gained in the metropolitan campaign for greater political clout and authority that the engineers could cherish the hope that a colonial technocracy might be easier to implement.

The emergence of engineering as a profession took place almost contemporaneously in the Netherlands and the United States. There are also other reasons why the colonial practices of the engineers in the Philippines and Dutch East Indies invite a comparison. First, the imperialism of both the Netherlands and the United States underwent a paradigm shift as new civilizing missions were developed in either country at the turn of the nineteenth century. In the United States the closing of the frontier in the late nineteenth century had ended its phase

[30] G. Bederman, *Manliness and Civilization: A Cultural History of Gender and Race in the United States, 1880-1917* (University of Chicago Press, 1996), 24.
[31] Haber**,** *Efficiency and uplift*, 105.

of continental expansion. Imperialism went overseas when it followed the growing reach of American commercial enterprises, but it was also buoyed by discourses that sought to preserve the frontier mentality that stretched back to the first American settlers and was supposedly crucial for the health of the nation.[32] In the Netherlands, the articulation of the *Ethische Politiek* or Ethical Policy in the years shortly before and after the close of the nineteenth century changed the objective of the colonial project in the East Indies colony from exploitation to development. The last restive regions were pacified shortly thereafter, and as the authority of the Dutch deepened and widened in the archipelago the commercial investments in the colonial economy took off. This boom attracted many immigrants from the Netherlands, but their reasons for heading East were more than merely pecuniary. Life in colony was thought to be adventurous, exciting, and full of opportunities. The colony came to play a similar role in the Dutch national imagination as the frontier did in the United States.[33]

In the Netherlands East Indies, as in the Philippines, engineers were part of this influx of colonial adventurers. Adventure, however, also entailed the presence of danger—and representations of the conditions on the islands showed the colony to be full of it. The threats the colonizers expected to face did not only stem from the unfamiliar surroundings and tropical disease. They also saw danger lurking in the indigenous populace. The discovery of the germ theory of disease had only very recently made the vectors that spread illness fully understood. But the theory was also appropriated by a new pseudo-scientific discourse of "contamination" in the West that argued that the Western colonizers faced the threat of social and cultural corruption in the colonies: the supposed moral vacuum of the indigenous colonial societies was a menace to the "civilized" outsiders. This discourse was particularly strong in the United States, where a latent fear of degeneracy had a long history in society. These fears fed both the American imperialist and anti-imperialist lobby: the former felt that the civilizing mission demanded that American men confront this challenge and fill the moral vacuum to hone their martial prowess and assert their virility and racial power; many of the latter feared that colonialism would corrupt America's young men and threaten the future health of the nation by degrading the race.[34]

What is immediately clear from this logic is that the threats posed by the colony were deeply gendered and racialized in the American discourse. Dutch literary works set in the

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[32] W. Lafeber and W.I. Cohen, *The Cambridge History of American Foreign Relations: The American search for opportunity, 1865-1913* (Cambridge University Press, 1995), 159; Bederman, *Manliness and Civilization*, 184.
[33] De Jong, *De waaier van het fortuin*, 354.
[34] K.L. Hoganson, *Fighting for American Manhood: How Gender Politics Provoked the Spanish-American and Philippine-American Wars* (Yale University Press, 2000), 134, 181.

Netherlands East Indies, such as Louis Couperus' novel *De Stille Kracht*, reveal that a similar preoccupation with physical and mental contamination was also prevalent in the Netherlands at the time.[35] Various studies have analyzed how the understanding of the categories of race and gender shaped Dutch and American imperialism and colonial rule.[36] However, no full studies exist on the importance of gender and race for the process of self-fashioning of the colonial engineers[37]—despite the fact that Ruth Oldenziel has convincingly shown that these aspects of the engineers were absolutely pivotal for their efforts to increase their social status in the United States.[38] Additionally, as has been mentioned before, the exclusively male engineers were the ultimate representatives of western rationality. This meant that in the eyes of the imperialists they would likely have been the foot soldiers of progress assailing the vestiges of a backwards and depraved tropical society, and in the eyes of the anti-imperialists they would have been the cannon fodder wasted on improving a cesspool. This study aims to fill the historiographical lacunae by revealing how the activities and rhetoric of the colonial engineers were inflected by their ideas on their gender and race, both through their own actions and through those of others.

Next to the similarities between the Netherlands and the United States already mentioned – the contemporaneous emergence of the engineering profession, receptivity of the general population to their rhetoric, new civilizing missions, and a shared fear of contamination and degeneracy – further similarities can be discerned, this time with regard to their neighboring colonies in Southeast Asia. Some of these similarities are geographical. Both are expansive archipelagoes located along the "Pacific ring of fire", and are home to many active volcanoes. The island chains are each comprised of many thousands of links, but in either colony the majority of the population was concentrated on a single large island; for the Netherlands East Indies on Java, and in the Philippines on Luzon.[39] However, the population of the former colony amounted to almost five times the population of the latter: about thirty-five million versus some seven million at the close of the nineteenth century.

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[35] L. Couperus, *De stille kracht: roman* (L.J. Veen, 1900). Also available in English as L. Couperus, *The Hidden Force; A Story of Modern Java* (Forgotten Books, 1921).

[36] A.W. Mccoy and F.A. Scarano, *Colonial crucible: empire in the making of the modern American state* (University of Wisconsin Press, 2009); F. Gouda, *Dutch Culture Overseas: Colonial Practice in the Netherlands Indies 1900-1942* (Equinox Publishing (UK), 2008); A.L. Stoler, *Carnal knowledge and imperial power: race and the intimate in colonial rule* (University of California Press, 2002); Hoganson, *Fighting for American Manhood*.

[37] Michael Adas did, however, devoted several pages to the subject. Adas, *Dominance by design*, 161-165.

[38] R. Oldenziel, *Making technology masculine: men, women and modern machines in America, 1870-1945* (Amsterdam University Press, 1999).

[39] E.H.G. Dobby, *Southeast Asia* (London: University of London Press Ltd., 1950), 216, 319.

Climatological differences between the two colonies, especially with regards to rainfall, are also significant. Although elevation and complex wind patterns can create microclimates allowing for considerable variation within both archipelagoes, Java has generally more pronounced wet and dry seasons, whereas precipitation in the Luzon region is generally more evenly spread through the year, although total annual rainfall can be up to twice as high as on Java. The Philippines are also often ravaged by typhoons, whereas the Netherlands East Indies, located closer to the equator, were spared such havoc.[40]

In both archipelagoes a combination of rice (often grown in paddy), maize, and tropical root crops was the staple food of the local populations, who used similar techniques for its cultivation.[41] Although their climates differed, both Filipinos and Indonesians[42] faced similar challenges. Typhoons and *bandjirs*[43] – flash floods of river systems that afflicted many parts of Java – and the lack of industrial building technology made the construction of permanent infrastructure impossible for the indigenous population. Bridges and waterworks were all erected on a temporary basis, and often destroyed by these violent natural phenomena.

American and Dutch engineers faced these similar destructive climatological challenges, and their technical solutions were often very much alike. But their solutions were shaped by more than just the practical necessities of each particular problem; they were also shaped by certain ideas of what exactly constituted improvement. Both the Dutch and American engineers were in the thralls of the idea of "permanence", and looked with admiration at the public works of ancient civilizations that had survived for millennia. They saw themselves as the architects of a new great civilization, like Rome—although, revealingly, the American focused on the road networks of the Romans while the Dutch were mesmerized by their aqueducts. Thus, even the technical solutions of the engineers deserve to be read as cultural productions when they were accompanied by such ideological rhetoric. These "engineering cultures"[44] were not confined to the national borders of the countries where the engineers lived and received their technical education. This study will therefore also seek to elucidate the shared elements of the Dutch and American colonial engineering cultures.

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[40] Dobby, *Southeast Asia*, 227, 321.
[41] Ibid., 231-233, 325-329.
[42] Although the demonym "Indonesian" is anachronistic here, for the purposes of readability it will be used to denote all the indigenous peoples of the Netherlands East Indies.
[43] Although the modern spelling is "banjir", this paper will use the original terminology used in the pages of the American and Dutch publications. Topographical names used in the primary sources will also be retained.
[44] Gary Lee Downey and Juan C. Lucena., "Engineering Cultures," in *Science, Technology, and Society*, ed. Sal Restivo (New York and Oxford: Oxford University Press, 2005).

The time period analyzed here commences in 1900, when the United States had quite suddenly become a colonial power in Southeast Asia and the Netherlands revamped its colonial mission with the launch of its Ethical Policy in 1901. It ends in 1920, when the Filipinization of the American colonial bureaucracy had much reduced direct American influence on the workings of the Philippine state, and when nationalist politics in the Netherlands East Indies led to increasing friction between colonizer and colonized. By drawing on the rhetoric used by colonial engineers to articulate their ideas on the civilizing mission, their technocratic aspirations, the elements of an international engineering culture will be reconstructed. To this end the publications of the engineers will be studied. These include several major engineering periodicals, annual reports of public works departments and engineering societies, political pamphlets, and the articles by engineers submitted to prominent journals outside their fields.[45]

In the historiography the colonial practices and civilizing mission of the Netherlands have been positioned alongside those of France and Britain, its close neighbors in Europe, whereas the late nineteenth-century expansion of the United States has often been contrasted with a more general "European" imperialism. To date no systematic comparison of the Dutch and American policies has been performed. This study is among the first to make a country-to-country trans-Atlantic comparison. To this end the political culture, economy, and society of the two countries will be explored in detail.

This two-part study commences with a historiographical overview of the literature on the emergence of the engineering profession and the new imperialism of the Netherlands and the United States. The first chapter of this part serves to familiarize the reader with the environments from which the colonial engineers originated, and lays the groundwork for the reconstruction of the engineers' vocabulary. The second chapter of this part will present the major elements of the Dutch and American discourses on their respective civilizing missions, and provides the ideological backdrop to the engineers' own ideologies of colonial development. In the second part of the study the focus will be squarely on the production of engineering cultures in the colonial contexts of the Netherlands Indies and the Philippines. It will investigate individual lives, moments of crisis, and the cultural production in the pages of periodicals and journals, to understand how colonial engineers fashioned themselves, and were fashioned, as the Missionaries of Modernity.

[45] See the Note on Sources on page 179 for more information on the periodicals used throughout this study.

# Part 1: Engineering and civilizing

## 1. Engineering: metropolitan origins

The historiography of engineering occupies an unusual position within the larger framework of the historiography of science. Although engineering is also embedded within the empirical paradigm of the exact sciences, it has the image of being an occupation set firmly within the "practical arts": instead of experimenting in a sterile laboratory environment, the engineer works with what he has, striving for the economical use of resources and the efficient management of labor and resources. Engineers are usually defined as those actors within the division of labor who have been trained in mathematics and natural sciences so that they may provide solutions to problems in the material environment that are of a technical nature.[46] But, simultaneously, the engineer has also proven to be a versatile canvas: the image of the occupation was finely attuned to the specific cultural, economic and political environment of the various locales its practitioners operated in. The engineer fulfilled an ideological role for many political movements, and engineers actively fashioned their image for maximum personal gain—they were both the subjects and objects of a process of identity formation.

In both the American and Dutch metropoles the decades between 1890 and 1920 were formative years for the engineering profession. As the membership of the occupation expanded explosively, issues of political power, social status, economic success and ideology came to a head for the engineers. By contextualizing the emergence of the engineering profession within the larger social and economic transformation that occurred in both the Netherlands and the United States in these years, this overview will also serve to show how engineers continually fashioned themselves and were fashioned in a rapidly changing society. Their optimistic belief in the in the improvement of society through the application of science and technology proved contagious for many within the Dutch and American public and polity. The engineer's jargon was adopted by those who sought to imbue their political programs with greater scientific authority, and engineering ideas on "efficiency" and "*nut*" ("utility") entered into the respective American and Dutch popular lexicon. The United States will be surveyed first, followed by the Netherlands. This chapter will conclude by assessing what

[46] Harry Lintsen, *Ingenieurs in Nederland in de negentiende eeuw: een streven naar erkenning van macht* (Den Haag: Martinus Nijhoff, 1980), 15.

methodological insights from the historiography are particularly useful for understanding the Dutch and American engineering communities.

## 1.1. Years of Progressivism: the United States

The early 1900s were not only a pivotal moment for America's young engineering profession, they were also a turning point in American social, economic, and political history. At the dawn of the twentieth century the value produced in the manufacturing sector for the first time exceeded that of the agricultural sector, heralding the arrival of the United States as an industrial nation.[47] On the back of the long economic depression of the late nineteenth century a wave of consolidation swept business across the country, creating a new type of corporate industrialism. Massive business cartels, the so-called trusts, sought after profits not by having their products compete effectively, but by cutting costs such as wages. This pitted management against the workers and made class conflict an endemic feature of the American economy.[48] Rapid urbanization turned more than half the population into city-dwellers by the second decade of the century as fifteen million immigrants settled in the US.[49] Significant internal migration also took place, with African-Americans moving north in large numbers to escape the racism of the south.[50] Gender relations, up until then governed by Victorian moral codes, changed as feminists demanded a space for women in the public sphere and industrial capitalism pushed men into industrial employment, undercutting their ideal of independence and autonomy.[51] Finally, the "muckraking press" exposed the extent to which corruption had become embedded in the political and economic functioning of the United States.[52]

The fraying of the political, cultural, and economic order that Americans from every walk of life had relied on was a protracted process, but its collapse can be located in the years of Progressivism. This amorphous movement gripped the country in the first decade of the century, and was defined by a clamor for "reform" that dominated the political discourse during the presidency of Theodore Roosevelt and the elections that first put Howard Taft and then Woodrow Wilson in the White House. It quickly faded from view during the First World War.[53] This relatively short-lived political phenomenon and its nation-wide appeal has presented a challenge for political and social historians who seek to explain its origins, widespread success, and sudden decline.

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[47] John Whiteclay Chambers II, *The tyranny of change : America in the progressive era, 1900-1917* (New York: Saint Martin's Press, 1980), 16.
[48] Steven J. Diner, *A very different age : Americans of the progressive era* (New York: Hill and Wang, 1998), 28.
[49] Chambers, *The tyranny of change*, 91.
[50] Diner, *A very different age*, 131.
[51] Bederman, *Manliness & civilization*, chapter 2.
[52] Chambers, *The tyranny of change*, 118.
[53] Ibid., 236.

This challenge also extends to historians working on the history of the engineering, as the emergence of that profession did not just coincide with the Progressive political moment but also collided and comingled with it. Engineering and Progressivism were in a complicated two-way relationship with one another. This has led to the historiography on both topics having become closely intertwined. When "the notion that the political and intellectual ferment of the Roosevelt and Wilson years cohered into an entity called progressivism," which was "one of the central organizing principles of American history,"[54] was called into doubt by scholars of political history in the early 1970s, the past of the young occupation also came to be seen in a new light. The fracturing of the image of Progressivism as a unified political program opened the era up to what Daniel T. Rodgers called a "pluralistic reading"[55], which painted a picture of a host of newly formed pressure groups in America forming loose coalitions with one another to effect change. That reading made visible the previously invisible avenues used by actors in these pressure groups to exercise power, and, in conjunction with the new fields of critical race theory and gender studies, drew actors into focus that had previously been overlooked in the historiography. How this affected the study of the engineering profession will be detailed below.

[54] Daniel T. Rodgers, "In search of Progressivism," *Reviews in American history* 10, no. 4 (December 1982), 113-132: 113.
[55] Rodgers, "In search of Progressivism," 114.

## 1.2. Ideology, profession, "efficiency"

George S. Morison, president of the American Society of Civil Engineers (ASCE), broached the topic of professionalism in his annual address of 1895 to the organization's members. He did this against the backdrop of the engineer's ambivalent status within the economic system, a problem that every member of the occupation had to wrestle with: on the one hand, the engineer was an integral part of the American capitalist order and as such loyal to the businesses that employed him; on the other hand, engineers were men of science who handled of esoteric knowledge and, like scientists, sought the autonomy to use that knowledge as they saw fit.[56] Morison was one of the first commentators to strike a new balance between loyalty and autonomy by giving a definition of the nature of the engineering "profession", proposing a mode of conduct for its members, and arguing for a collective mission—in short, he formulated its ideology.[57] The ideology had its foundation in "the assumption that their group had a unique and vital role to play in social progress."[58] This ideology would later become indelibly connected to the writings of Thorstein Veblen, but by the time the idiosyncratic author had risen to national prominence in the 1910s the ideology had already established itself as a powerful intellectual current among American engineers.

This ideology started from the claim that all technology had been wrought by engineers, or "technologists", who as bearers of this key to the future improvement of civilization had a special role to play in society. The cohesion of the engineering profession was to be derived from their shared ability to translate scientific knowledge into practical use, thus defining engineering as "applied science." Guided by science, its members would conduct themselves as impartial arbiters of social problems, offering solutions that followed from clear logic and hence promised the produce best outcomes. However, this appeal to logic and science did not imply that the work of engineers would be morally neutral. Engineers believed that their supposedly unbiased perspective gave them a superior moral understanding of society. Finally, the engineers had an altruistic responsibility towards the public as "priests of material development", as Morison had called the profession's members.[59]

The ideology of engineering was formulated at a time when the number of engineers and engineering education programs were increasingly rapidly in the United States: the

[56] Edwin T. Layton, *The revolt of the engineers; social responsibility and the American engineering profession* (Cleveland: Press of Case Western Reserve University, 1971),Layton, *The revolt of the engineers*, 54.
[57] Ibid., 57.
[58] Ibid., 58.
[59] Ibid., 57-60. The quote appears on page 58.

student population stood at ten thousand in 1900, a tenfold increase of enrollment a decade earlier. The engineers were increasingly aware of their growing social clout, and the self-congratulatory tone of the ideology must have appealed to many of them. But its dissonance with the actual social status of the engineer, which was much more modest, bred resentment and became a call to action.[60] The engineering societies such as the ASCE, AIEE (the American Institute of Electrical Engineers) and ASME (the American Society of Mechanical Engineers) worked to underpin the engineers' claims to social responsibility with their efforts to make their membership appear more trustworthy, for example by creating constitutions governing their organization's functions and by adopting codes of ethics that their members should obey. There were also unsuccessful efforts to merge the existing organizations in hopes of unifying the profession.[61] These mergers failed because several competing factions could be distinguished within the profession at the time: fault lines existed between older, established engineers and a much larger younger group seeking entry into the workforce. But despite this internal competition within what was supposed to be a united profession, many of its members believed that their collective social status could be improved by taking an active role in politics.[62]

It was in the political arena that the interests of the engineers and the Progressives coalesced. Progressives wished to re-organize society and politics under the banner of "reform." They were gripped by a "progressive ethos", which John Chambers in an influential reading doubly defined as a combination of "the nineteenth century sense of Protestant evangelism with the new methods of science and large-scale organization",[63] and as a combination of "moral idealism and pragmatic, piecemeal reform with a sweeping vision of democracy and rejuvenated national community."[64] In practice the clarion call of reform translated into a campaign to overcome the political corruption that Progressives saw as endemic. They sought a through the reorganization of the state apparatus and the creation of a bureaucracy that was not beholden to powerful interest groups seeking to capture the political system for their own ends.

In many ways engineers appeared to fit the role of the experts that would staff these new impartial bureaucracies. But Progressives and engineers also collided, because the campaign to create a bureaucratic apparatus was inimical to the engineers' efforts to gain

[60] Layton, *The revolt of the engineers*, 61.
[61] Ibid., 84.
[62] Ibid., 61.
[63] Chambers, *The tyranny of change*, 112.
[64] Ibid., 232.

authority and autonomy for their profession. Edwin Layton has observed that "[engineers] regarded their proposals as substitutes for progressive reform, not as supplements to them."[65] Engineers were threatened by the emerging bureaucracies being put in place by Progressives because these would force them into increasingly subordinate roles, diminishing their independence, authority, and social status.[66]

But the relationship between Progressives and the engineers went beyond mere collaboration and competition, as they were connected to one another through their shared interest in the elimination of waste. This connection is most clearly seen in the use of the buzzword "efficiency" by both groups, an idea so popular that it developed into a full-blown craze.[67] This craze had its origins in the scientific management movement that was spearheaded by Frederick W. Taylor. He had gained national prominence by resolving a labor conflict at a railroad company in 1910 by promoting the efficiency of its operations. But rather than portraying this economical solution merely as an achievement of financial management, Taylor turned the so-called Eastern Rate Case into a morality play fit for the consumption of the American public: he presented efficiency as a form of moral behavior that served the public interest.[68] He codified his ideas in his wildly successful 1910 book *The principles of scientific management*, which made the case that engineers were the crucial social intermediaries that could resolve the conflicts between capital and labor .[69]

Progressives were attracted to the moral agenda contained within Taylor's scientific management as they had embarked on a campaign of "conservation" – see Theodore Roosevelt's campaign to preserve the American landscape in national parks – and latched on to scientific management's popular success by adding "efficiency" to their rhetorical repertoire.[70] For them, efficiency became shorthand for effective political administration run by experts that would reestablish the social harmony that had been lost in the wrenching economic changes brought on by corporate industrialism. It gave Progressives the tools to "uplift" the American working classes into the middle-class morality and to make an end to the class struggle that destabilized economy and society. But Taylor and his followers also offered something more to Progressives from the privileged and established classes: by

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[65] Layton, *The revolt of the engineers*, 64.
[66] Ibid., 79.
[67] Samuel Haber**,** *Efficiency and uplift; scientific management in the progressive era, 1890-1920* (Chicago: University of Chicago Press, 1964), x.
[68] Ibid., 54.
[69] Ibid., 24-25.
[70] Haber showed how various influential middle-class reformers of the era such as Louis Brandeis, Herbert Croly and Walter Lippman were charmed by Taylor's "scientific management" and adopted parts of it in their own solutions for the social problems that vexed the country.

favoring the expert as an authority, scientific management tempered some of the radically democratic aspirations of the people. Engineers and Progressives therefore both stood to gain from the rhetoric of efficiency. The engineer and engineering were turned into symbolic representations and appropriated by various actors and groups in American society in favor of reform. The technological rhetoric of the engineers became a reservoir of symbols that political movements drew from to support their ideological convictions, making the discourse of engineering a common thread "connecting social institutions, cultural process, and political practice."[71] It created a language that functioned as a jargon, investing the speaker with power and authority.

By 1915, however, the efficiency craze had run its course, and its power as a rhetorical device waned. Samuel Haber has ascribed this to its success, as the tenets of its message as a lesson in morality had been absorbed by society and become mainstream.[72] As the craze that had made them the focal point of public interest subsided, other developments also worked to undermine American engineers' campaign to increase their professional power. First, the centrifugal forces within the profession frustrated attempts to unify its membership: electrical, mining, and mechanical engineers increasingly went their own ways as they looked out for their parochial interests; various new societies and professional organizations sprouted from the fertile ground of engineering as its sub disciplines evolved and expanded; and the ASCE that Morison had belonged to was almost torn apart by the generation gap between its older and younger members.[73] Second, the benefits that had been expected to accrue from the increased application of scientific management, and which should have legitimated the authority and autonomy sought by the engineers, often failed to materialize, so that the program lost much of its economic foundation.[74]

Third, simultaneously with the waning of Progressivism during and after World War I, engineers increasingly resigned themselves to a role as cogs within corporate industrialism, rather than fighting to become the designers of the grand machinery that they had aspired to be.[75] The enthusiasm of engineers to go beyond the technical necessities of their occupation and also concern themselves with labor control and social engineering often worked to support the prerogatives of the emerging system of corporate capitalism—they "consciously undertook to structure the labor force and foster the social habits demanded by corporate

[71] John M. Jordan, *Machine-age ideology: social engineering and American liberalism, 1911-1939* (Chapel Hill: University of North Carolina Press, 1994),5.
[72] Ibid., 118.
[73] Ibid., chapters 4 and 5.
[74] Ibid., 212.
[75] Ibid., 201.

capitalism."[76] This was an inversion of what Veblen had envisioned: he had written of a "soviet of technicians",[77] an independent and socially respected engineering collective which would guide social and economic development with its application of scientific management. But engineers proved unable to remodel the economic and social order to their liking and instead staked out a domain for themselves within the confines of corporate capitalism.[78]

However, the social status of the engineers was not only tied up in their role within the economic system, even though much of the early historiographical literature on the engineers' campaign of professionalization has given that impression. By focusing squarely on the efforts of engineers to remodel their community to make it more closely resemble those occupational classes that had been most successful in gaining social status and respectability – such as doctors and lawyers who formed powerful medical and legal associations – the path towards professionalization appeared as the most important method for analyzing the rise of an occupational group. Later research conducted in the vein of what Rodgers had described as the "pluralistic reading" noted that the engineers' campaign to improve their social status was partially detrimental to the efforts of other social groups seeking betterment of their circumstances. Engineers (and Progressives) made use of the scientific rhetoric of engineering to contrast their own image with that of other competing social groups. By emphasizing their own supposed scientific rationality, engineers discredited competing social groups by portraying them as hysterical, overly emotional, or generally irrational.[79] Throughout much of the Progressive Era this process of "othering" was directed against African Americans, women, and the waves of immigrants that threatened to diminish the economic security, cultural authority, and political power of the established middle-class.[80]

These supposed threats bred anxiety among white, male Americans. Because wage labor became increasingly common and unavoidable in the context of industrial capitalism, white middle-class American men were being confronted with mounting difficulties as they tried to live up to the ideal of independence prescribed by the once-dominant Victorian social mores. This led to a shift in the popular ideas of what constituted desirable personal behavior. The gentlemanly self-control that Victorians tried to live by was jettisoned in the year leading up to and during the Progressive Era and replaced by the "vigorous life" with its emphasis on virility, strenuous exercise and even aggression. These were the traits on which America's

[76] Jordan, *Machine-age ideology*, xxiv.
[77] Thorstein Veblen, *The engineers and the price system* (New York: Cosimo Classics 2006), 91.
[78] Noble, *America by design*, xxiv.
[79] Jordan, *Machine-age ideology*, 4.
[80] Diner, *A very different age*, chapter 5.

frontier society had supposed been built, and building character through this rough living was thought to be a defense against the supposed danger of effeminacy, overcivilization, and decadence.[81] The closing of the frontier in the late nineteenth century and the increasing prevalence of a new set of mental disorders called neurasthenia were thought to be evidence for the reality of this danger.[82] In the (pseudo) scientific discourses of the day the threat of the psychological destabilization of the American was intimately connected to anxieties of race. Theodore Roosevelt, the most prominent proponent of vigorous living, made constant allusions to an impending racial suicide if American men did not reinvent themselves. His Social Darwinist visions of an ongoing "race war" are further evidence of the extent to which the new ideals of the vigorous life were directed against an "other", and how exclusion and repression were elements integral to his vision of masculinity.[83] Race therefore became part of the foundation for the new patriarchal power that was created between 1890 and the entry into the First World War.[84]

In this atmosphere of race and gender anxiety the predominantly white, male engineers organized to bar women and African Americans from entry into their profession to prevent these underprivileged members of society from diluting the social status of the engineering profession. The application of gender studies and critical race theory has drawn into clearer focus how deliberate efforts were made by the "in"-group to create a gendered and racialized profession that would perpetuate the exclusion of those outsiders. The codes of ethics that previous literature had analyzed from the paradigm of professionalization were, when seen in this new perspective, part of larger discursive project that was meant to assuage the anxieties of engineers who felt that their racial and masculine power were being threatened. Even the collective empowerment that historians working within the older "organizational" paradigm saw in the formation of the professional societies was in part driven by these anxieties according to those applying gender theory: the creation of a "fraternal world" acted as another barrier to entry for women who aspired to be engineers, and hence served as another safeguard for the status of male engineers.[85]

The professionalization campaign of the engineers in the United States can therefore be better understood within the context of the changing class and gender codes in wider American society. Embedding the campaign for status of the engineers in the change from a

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[81] Bederman, *Manliness & civilization*,79.
[82] T.J.J. Lears, *No place of grace: antimodernism and the transformation of American culture, 1880-1920* (University of Chicago Press, 1994), 38, 56.
[83] Lears, *No place of grace*, 189-190.
[84] Bederman, *Manliness & civilization*, 5.
[85] Oldenziel, *Making technology masculine*,16.

Victorian moral order to one of vigorous living as per the ideals that Theodore Roosevelt publicly embodied as the archetypical Progressive, allows for otherwise hidden scripts to be revealed as informing the opinions and actions of actors from the engineering occupation. Thus, even though the engineers ultimately failed to create a profession with a social status on a par with the medical and legal community, they still succeeded in creating a shared consciousness or *esprit de corps* despite the failure to effectively organize themselves. This sense of an engineering community was the result of both an ideology built on the belief that its members possessed esoteric knowledge and superior rational minds – and thus was something that one wished to belong to – and of the creation of a gendered and racialized space that produced cohesion by excluding "others": women, immigrants, and non-'whites'.

That the drive towards autonomy and greater social status would fail was still unclear in the years that the Progressive movement dominated the American political landscape, however. The fact that Progressives also took up the language of efficiency and (scientific) management as an instrument to establish their authority and make claims to power appeared to offer a bright future for the engineers. That future promised administration being carried out by experts, although the shape of this system was still unclear—it even lacked a common name. For example, the vision of Herbert Croly, co-founder of the influential magazine *The New Republic* and whose calls for Progressive reform were steeped in the language of scientific management, has been described as a "plebiscitarian administocracy."[86] Thorstein Veblen, who believed engineers would be the perfect candidates for pulling the levers in such an administration of experts, had called it a "soviet of technicians." Not until the early 1930s, when the American public's faith in the ability of politicians to come up with solutions for the ongoing economic depression had been shaken and engineers again appeared to have the answers did the system become known among the general public under a single name, when the Technocracy Movement proposed the management of society by technical experts.[87] Short-lived though the movement was, their concept of "technocracy" has endured.

[86] Haber**,** *Efficiency and uplift*, 86-87.
[87] William E. Akin, *Technocracy and the American Dream:the Technocract movement, 1900-1941* (Berkeley: University of California Press, 1977), x.

## 1.3. The Netherlands: *de maakbare samenleving*[88]

The take-off into sustained economic growth of the Netherlands lagged behind that of its closest neighbors. It took well into the 1880s for the power provided by steam engines to exceed that generated by the thousands of windmills that littered the country.[89] And yet the country did excel in some sectors, particularly in the fields of bridge building and hydrological engineering. The growth of the railway network sped up in the late 1850s, leading to the construction of large bridges to span the wide delta of rivers running through the country. Progressively more impressive feats of construction and design were achieved, culminating in successes such as the Moerdijk-bridge across the Hollands Diep: when this locally designed and forged railway bridge was opened in 1872, its seven million kilograms of iron and steel traversed almost a mile of water, making it the longest bridge on the continent.[90] The quality of hydrological engineering in the country garnered the Dutch engineers acclaim abroad, and many of them went on to work on foreign sites like Eastern Europe, Japan, Egypt, and South America.[91]

Two decades later, the gap between the Netherlands and the United States in terms of economic structure and technology had narrowed considerably: the economic structure had evolved to such a degree that in the Netherlands, too, large corporations were driving innovation in the petrochemical and electrical sectors.[92] But even though industrial activity "exploded" after 1890, it has been observed that "industry never dominated its economy; agriculture, trade, services, and the colonies remained equally important components of a strongly diversified economy."[93] Despite the rapid economic modernization, differences persisted between the economic structure of the small European country with large colonial possessions and that of the continent-sized nation of immigrants across the Atlantic.

The past of the engineering profession in the Netherlands is nevertheless in many ways remarkably similar to that of its counterpart in the United States. As will be shown in further detail below, among the shared characteristics are the similar male, middle-class backgrounds

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[88] "De maakbare samenleving" translates as "the malleable society", an idiomatic turn of phrase referring to social engineering.
[89] Harry Lintsen, "Een land met stoom," in *Geschiedenis van de techniek in Nederland: De wording van een modern samenleving 1800-1890 6*, Harry Lintsen ed., 191-216. (Zutphen: Walburg Pers, 1995),192.
[90] A.J. Veenendaal, "Spoorwegen," in *Geschiedenis van de techniek in Nederland: de wording van een moderne samenleving 1800-1890 2*, Harry Lintsen ed., 129-163. (Zutphen: Walburg Pers, 1993), 148, 157.
[91] Van der Woud, *Een nieuwe wereld*, 121.
[92] J.W. Schot, H.W. Lintsen and A. Rip, "Betwiste modernisering," in *Techniek in Nederland in de twintigste eeuw 1*, ed. J.W. Schot, H.W. Lintsen and A. Rip, 17-35. (Zutphen: Walburg Pers,1998), 21.
[93] J.C.H. Blom and E. Lamberts ed., translation James C. Kennedy, *History of the Low Countries* (New York: Berghahn books, 1999), 404.

of its members; their attempts to improve their social status through professional organizations and the adoption of codes of ethics; their interest in improving the social conditions in their country, which was coupled to a sense of superiority stemming from their supposed monopoly over presumably unbiased scientific inquiry; their participation in new political movements that saw a greater role for the state; and, finally, their technocratic aspirations.

## 1.4. Delft, and beyond

In the Netherlands the Military Revolution had necessitated the building of fortifications of great mathematical complexity to defend against artillery. The designers of these structures who built them were absorbed into the ranks of the standing armies.[94] American engineers would also owe part of their origins to the Army Corps of Engineers, which was founded in the eighteenth century.[95] The construction of large public works projects such as canals and railroads from the early nineteenth century onwards gave birth in both countries to the civilian counterpart of the military engineer, the civil engineer. By mid-century, education no longer took place merely on the job or at the military academies, but also at specialized institutes of learning. The spectacular expansion of engineering education in the US has already been noted, but in stark contrast to the American experience – where twenty-one engineering colleges had been founded by 1870, and over a hundred by the end of the century – the Netherlands had only a single site for the training of civil engineers until 1920: the city of Delft, which up to this day remains almost synonymous with technical education. The school there went through several incarnations as its student body expanded: first, since 1840, as a royal academy; after 1864, in the wake of nation-wide education reforms as a *Polytechnische School* (Polytechnical School) that provided a form of vocational training; and after 1905 as a *Technische Hogeschool* (Technical College) providing degrees on a par with those of the universities.[96]

The recognition of the academic quality of the Delft curriculum came after many years of lobbying by engineers who wished to elevate the status of their educational institute. This campaign was led by two Dutch professional organizations, the *Koninklijk Instituut van Ingenieurs* (KIvI, the Royal Institute for Engineers) founded in 1847 and the *Vereniging van Burgerlijke Ingenieurs* (VBI, Society for Civil Engineers) founded in 1853, which for most of the nineteenth century were the only institutions of their kind. The KIvI was dominated by engineers working in the military, the Netherlands Indies, and *Rijkswaterstaat*, the large state bureaucratic apparatus tasked with maintaining the country's hydrological infrastructure. The VBI was exclusively the home of Delft graduates and contained many engineers with a

[94] Lintsen, *Ingenieurs in Nederland in de negentiende eeuw*, 28-30.
[95] Layton, *The revolt of the engineers*, 1-3.
[96] Lintsen, *Ingenieurs in Nederland in de negentiende eeuw*, 344.

background in railroads and civil engineering. Both had been founded with the implicit intention of improving the social status of the engineer.[97]

There was initially little competition between the two engineering societies, but there was also little cooperation. This was due in part to their catering to different audiences, and in part due to their different goals: the KIvI portrayed itself as a rigidly scientific organization whereas the VBI's goal was to promote the interests of its members.[98] Even when the recently founded societies for mechanical (1889) and electrical engineers (1895) merged with the steadily shrinking KIvI in 1899, efforts were made not to impinge on the domain of the VBI, which had seen its membership grow in recent years. The latter changed its name to *Vereniging van Delftse Ingenieurs* (VDI, Society of Delft Engineers) in 1900 to emphasize its role as a protector of the interests of Delft educated engineers. And yet, that was also the same year that the VDI reached an agreement with the enlarged KIvI to jointly publish the successful weekly *De Ingenieur* which it had founded in 1886.[99] The complicated two-step between the societies shows that while there was no clear, single community of engineers in the Netherlands, there was also no complete fragmentation. Instead a segmented profession containing multiple pressure groups that each had their own occupational cultures existed. The members of these groups preferred to deal with colleagues from their own segment, but they also extended friendships and collegial relations to the larger professional domain.[100]

With the closing of the 1800s and the dawning of a new century, a new era also began for Dutch engineering. Modernization, though belated compared to other countries, had still bred anxieties in Dutch society that were comparable to those of more economically advanced countries. Dutch engineers, like their American colleagues, responded by taking an active interest in the political process.[101] Unemployment, the abominable conditions the working classes lived in, and the adversarial relations of labor and capital were among the pressing social problems collectively known as the "social question", and engineers actively partook in the political process that grappled with this conundrum.

A new generation of liberal politicians who envisioned an active role for the government had several engineers in their midst. Two engineers from Delft acted as ministers of the department of Waterstaat, Trade and Industry in the three liberal cabinets that governed

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[97] Lintsen, *Ingenieurs in Nederland in de negentiende eeuw*, 226.
[98] Ibid., 226-243.
[99] Ibid., 288.
[100] Ibid., 355-356.
[101] Harry Lintsen, *Ingenieur van beroep: historie, praktijk, macht en opvattingen van ingenieurs in Nederland* (Den Haag: Ingenieurspers, 1985), 44.

the country between 1891 and 1901.[102] In that capacity they contributed to the spate of social legislation that regulated safety in the workplace, improved housing, and created health laws. Their liberalism supported government intervention and broke with the laissez-faire tradition of the past, and the movement was replete with figures who styled themselves as progressive-liberals, social-liberals, or (in following of the French examples) radicals.[103]

More clearly left-wing sentiments ruled in Delft, where many students and recent graduates became enamored with socialism during their time there. Conditions for activism amongst engineers trained in the city were in many ways propitious. The VDI's weekly *De Ingenieur* provided Delft engineers an outlet where they could editorialize on the social question, something which they did enthusiastically. The students' "Debating Club", founded in the late nineteenth century, often hosted discussions on the social question, inviting speakers from affiliated organizations in other Dutch university towns. It counted among its members the later editor of *De Ingenieur* R.A. van Sandick and the illustrious member of parliament and colonial enthusiast H.H. van Kol. The socialist rhetoric voiced there during the 1890s was sufficiently anti-establishment to be deemed subversive by the state security apparatus.[104] The Debating Club's activism gave the city the reputation of "red Delft", and other idealistic organizations of a socialist bent were founded by its members. Like earlier graduates from Delft and Dutch engineers who had learned their trade on the shop floor instead of the schoolroom (and just as their American counterparts) the new crop of Delft engineers believed that the answer to the social question lay in the resolution of the wasteful conflicts between capital and labor. The young graduates were more convinced than those who went before them that the role of their own profession in providing such a resolution was crucial.[105]

It is likely that the fact that the Delft engineers had all received their training at the same institution and belonged to the same student population imbibed them with the belief that the profession they were entering into was united to a similar degree. Even though the shared experience did provide some foundation for professional cohesion[106], this belief was overly rosy. Aside from differences of political opinion amongst the engineers, new industrial techniques and corporate organization came to exert the same centrifugal forces on the

[102] Cornelis Lely (1891-1894, 1897-1901) and Philippe Willem van der Sleyden (1894-1897) took up the posts in the three liberal cabinets. Lintsen, *Ingenieur van beroep*, 45.
[103] Jan Bank and Maarten van Buuren, *1900 : hoogtij van burgerlijke cultuur* (Den Haag: Sdu Uitgevers, 2000), 35-36.
[104] Willem Ravesteijn, *De zegenrijke heeren der wateren : irrigatie en staat op Java, 1832-1942* (Delft: Delft University Press, 1997), 216.
[105] Lintsen, *Ingenieur van beroep*, 44.
[106] Disco, "Made in Delft," 199-205.

engineering community in the Netherlands as it did in the United States.[107] No longer the follower nation it had been several decades earlier, by 1900 the country had become home to well equipped R&D labs, large multinationals, and an empowered interventionist government seeking to spur growth with its policies, each of these fields taking engineers in different professional directions.

But even though the Dutch engineering community was not as cohesive as many wished it to be, a strong sense of collegiality existed among the practitioners of the occupation. This was not merely a result of having sat in the same college benches but of the extra-curricular life of the engineering students too. Turn-of-the-century Dutch engineers deemed it vital that engineers develop their social skills in order to adequately respond to the challenges of their future work environment. Particularly noteworthy in this training process was the role of the *Delftsch Studenten Corps* (DSC), which until 1897 was the only student society in the city and had 80 per cent of the students in its member rolls. The Dutch student societies of the "corps" variety resembled the many "Greek" fraternities and sororities in the United States in spirit, but exceeded their individual chapters in the number of active members, who in the Netherlands numbered in the hundreds, if not thousands. The societies were sites were homosocial activities could take place and friendship networks forged. Hazing rituals initiated new members into a world with its own social mores, fostered inter-generational amity, and shaped their masculine identities. Members and alumni believed that DSC membership would imbue the students with the social skills necessary for controlling a demanding workplace, where social skills and technical acumen would both be tremendously valuable.[108] At the same time the DSC, with its fraternal environment, served as an example of the kind of brotherhood of engineers that graduates of Delft hoped to reproduce at a professional level—and that they would then leverage to improve their social status and political influence.

The crisis of modernization created opportunities for new groups to manifest themselves in the Dutch political arena, and engineers had every reason to believe that they might successfully grasp those opportunities and secure positions of great influence. In the mid-to-late nineteenth century, engineers working at the *Rijkswaterstaat*, the hydrological state apparatus mentioned earlier, were invested with such power: they were often able to overcome the opposition of other bureaucracies and pushed through design decisions that were closest to their own prerogatives. Throughout the twentieth century engineers functioned

[107] Disco, "Made in Delft," 49-52.
[108] Ibid., 138-139.

as influential experts for the increasingly interventionist government administration, and in that capacity engineers had, at the very least, considerable influence in the policymaking process. Sporadic instances of unprecedented autonomous political decision-making by engineers took place in response to the wrenching social question: the planned expansions of cities to accommodate the growing urban population, and the wholesale design of towns to be built on land recently reclaimed from the sea and expansive road networks were outlets of their technocratic ambitions. But even an acclaimed architect such as H.P. Berlage could not push through his plans in the early decades of the 1900s without having significant modifications foisted upon him by city politicians.[109]

Looking back it is clear that technocratic rule was chimerical in the Netherlands; engineers never possessed such a powerful mandate that they could perform their tasks autonomously.[110] They had to contend with too many other social groups that came to the fore simultaneously. In the Netherlands engineers did not rise above the other groups of scientifically trained experts who came to believe that their scientific authority also provided them a legitimate claim to political power, and therefore had to share a discursive space with them. The logical inference made by many academically trained scientists at the time was that their scientific research contributed to the modernization process so that they were the ones who could help control it—essentially the same logic of the engineers, but with science taking the place of technology in this rationalization.[111]

Dutch society was susceptible to this scientific rhetoric of the scientists and engineers. This can be gleaned from the adoption of the jargon used in those professions by society at large. The concept of "normalization", which had once described the elimination of erratic river flows, was picked up as a popular buzzword that came to refer to any effort to make what was once chaotic into something "systematic."[112] These concepts combined with the Dutch bourgeois ideal of *nut* (utility) to form a political imperative to systematize and normalize not only the environment, but business and society too. The hoped-for result of this systemic thinking and normalizing was an improvement of the *rentabiliteit* or profitability of social and economic activity.[113] In other words: "efficiency" had also made its way – via a

[109] D. van Lente and J.W. Schot, "Techniek als politiek: ingenieurs en vormgevers van de Nederlandse samenleving," in *Techniek in Nederland in de twintigste eeuw 7*, ed. J.W. Schot, H.W. Lintsen and A. Rip, 197-231. (Zutphen: Walburg Pers,2003), 200.
[110] Van Lente and J.W. Schot, "Techniek als politiek," 199.
[111] David Baneke, *Synthetisch denken: natuurwetenschappers over hun rol in een moderne maatschappij, 1900-1940* (Hilversum: Uitgeverij Verloren, 2008), 4.
[112] Van der Woud, *Een nieuwe wereld*, 12.
[113] Ibid., 109.

route found locally – into the Dutch vocabulary by 1900, where it proved a potent rhetorical tool in the years that followed.

## 1.5. Transatlantic fraternity: inspiration, emulation, and cooperation

In 1900, having just returned from a visit to the United States, the Dutch engineer R.P.J. Tutein Nolthenius gave a seminar on his travel experience to an assembled audience of the KIvI of which he was a member. As part of his American journey he had visited a renowned bridge-builders' factory, where he was struck by how utterly un-striking it was: the no-frills design of the site exuded the concern for efficiency of the American engineers, a trait they were known for amongst their European colleagues. To a British or French engineer, for whom design meant form as well function, such a blatant disregard for aesthetics was likely to have been unpalatable. But for Tutein Nolthenius, the emphasis on utility was familiar, and he told his listeners that he could think of no other place where a Dutchman in his profession might feel more at home.[114]

Reading the various trip reports in the pages of the KIvI's publication *De Ingenieur* it is obvious that Tutein Nolthenius was hardly the only Dutch engineer who took an interest in the achievements of his colleagues across the Atlantic. The editor of the weekly, R.A. van Sandick, visited the country in 1904 and delivered a favorable speech on the life of the American engineer which he reprinted in the weekly;[115] C.F. Stork, a scion of the family that founded the Stork mechanical conglomerate, did the same when he visited the country for business in the same year.[116] H.P. Berlage wrote a glowing report of Manhattan and Frank Lloyd Wright's designs,[117] and irrigation engineer P.J. Ott de Vries investigated the impressive irrigation works in the western part of the United States.[118] But not all reports looked as wistfully overseas as these; a Dutch engineer working in the United States told the readers of *De Ingenieur* of the much heavier workload American engineers were accustomed to,[119] and a consular report warned Dutch engineers who were considering to emigrate to America that they might face a dearth of employment opportunities there.[120]

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[114] Van der Woud, *Een nieuwe wereld*, 123, 126.
[115] R.A. van Sandick, "Voorlopig verslag van een reis door de Vereenigde Staten van Noord-Amerika," *De Ingenieur* 20, no.4 (1905).
[116] C.F. Stork, "Eenige mededeelingen naar aanleiding van een technische reis in de Vereenigde Staten van Noord-Amerika," *De Ingenieur* 19, no.49 (1904).
[117] H.P. Berlage, "Indrukken over Amerikaansche architectuur," *De Ingenieur* 27, no. 19 (1912).
[118] J. Kraus "Korte mededeeling naar aanleiding van een Verhandeling in het Tijdschrift der afdeeling Ned.-Indië van het lid P.J. Ott de Vries over het irrigatiewezen in het Westen der Vereenigde Staten," *De Ingenieur* 26, no. 13 (1911).
[119] Anonymous Dutch engineer in the United States, "Nederlandsche Ingenieurs in de Vereenigde Staten," *De Ingenieur* 18, no.37 (1903).
[120] Consular report submitted to the editor, "Verslag (Consulair) over de Vereenigde Staten van Amerika," *De Ingenieur* 21, no.35 (1906).

But the reservations expressed in the critical articles do not unseat the conclusion that Dutch engineers felt that their conception of their profession was in tune with the attitudes of the American engineers. Their gravitation to their confreres in the United States was not for lack of a broader international orientation on the part of the Dutch professionals: during their first year in Delft the students received an education in French, German, and English to allow them to keep up with the publications in foreign journals.[121] The focus of the Dutch engineers on the United States was therefore elective, instead of being the result of a pre-existing transatlantic affinity for the country. In short, despite having emerged from the highly specific local conditions of the Netherlands, Dutch engineering developed a culture that its members felt was uniquely congruent with that of the United States.

Historians have adopted several perspectives in search of an explanation for the creation of occupational communities by the engineers in the Netherlands and in the United States—communities that, as the above shows, may even extend across the Atlantic. These perspectives view the identity of the engineers as constituted along several axes. The first of these is the engineer as a member of a "profession." Many engineers fostered that hope that uniting their occupation into a cohesive group – for example, into something akin to the American Medical Association in the United States – was the best method for collectively campaigning for greater social status and political influence. Although these efforts were ultimately unsuccessful due to a fragmentation of their occupation into different segments, engineers in either country still clustered into leading societies that through their respective journals and publications contributed to the shaping of the image and identity of the engineers.

The second axis conceives of the engineers as members of an exclusive "brotherhood." This perspective has been applied most fruitfully to the study of the American engineers—which is to some extent surprising, since Ruth Oldenziel, the author of the most influential work of this kind, is herself Dutch. But the example of the great importance that Dutch engineers attached to the membership of the DSC during their years of training at Delft and the fraternal bonds that were created there underline that this vantage point is also valuable when studying the history of the engineers in the Netherlands. The use of gender and critical race studies reveals how engineers fostered a white, masculine identity that they could then leverage against other rising social groups and in the process enhance their own social power.

[121] Van der Woud, *Een nieuwe wereld*, 120-121.

The third and final axis along which engineers constituted their identity, and which builds upon those of professionalism and gender power, is that of their "rationality." Drawing from the discourse of science, engineers presented themselves in either metropole as objective observers who could point a way out of the conflict between capital and labor, and who could pass judgment over policy without falling prey to political bias. In the fraught political and social climate of the late nineteenth and early twentieth centuries, engineers fashioned themselves, and were also fashioned by other social forces, as trustworthy characters deserving of being invested with authority. It is along these three axes that the engineers will be analyzed throughout this study.

## 2. "Civilizing"

American and Dutch imperialism underwent a sea change in the years between 1898 and 1901. The nineteenth century continental expansion of the United States over land, which has been described as the its "first empire"[122], neared completion by the 1890s when the country's settlements reached from the Atlantic to the Pacific. By that time the rise of America as a major economic power and the comparative decline of Britain's economic might vis-à-vis new European competitors – specifically Germany – had led to a gradual retreat of the British from Latin America. It ushered in an era of US hegemony in the Western hemisphere, making the Monroe doctrine a practical reality.[123] At the close of the 1890s America began its second empire when it went overseas: the administration of president William McKinley claimed the island possessions of Spain for itself in the Treaty of Paris that concluded the Spanish-American War of 1898. The US thus assumed control over Guam, Puerto Rico, and the Philippines. This outcome demanded that a new apparatus of colonial control be created by the Americans, who had little previous experience with such a mode of governance.[124]

Something new was afoot in the Netherlands and its Indies colony too. The three previous centuries of involvement in the Netherlands Indies had been centered on the extraction of primary resources from Java and several spice island in the Moluccas, so that the Dutch presence in the peripheral areas of the colony was only slight. But new military tactics taken up in the 1890s durably extended the reach of the colonial administration to the outer islands of the archipelago for the first time. It is therefore possible to speak of imperialist expansion even though this took place within the recognized borders of the colony.[125] In addition, an article critiquing the administration's operations published in the influential journal *De Gids* in 1899 by C.Th. van Deventer, who spent most of the previous two decades working for the judiciary and as a lawyer in the colony, set in motion a series of events that led to the promulgation of a new colonial policy in 1901. This new policy reoriented the tasks of the Netherlands Indies' colonial government from resource extraction towards intervention

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[122] Paul A. Kramer, "Empires, exceptions, and Anglo-Saxons: race and rule between the British and U.S. empires, 1880-1910," in *The American colonial state in the Philippines: global perspectives*, ed. J. Go and A.L. Foster (Duke University Press, 2003), 64.64

[123] Ibid., 63-68.

[124] Julian Go, "Introduction: global perspectives on the U.S. colonial state in the Philippines," in *The American colonial state in the Philippines: global perspectives*, ed. J. Go and A.L. Foster (Duke University Press, 2003), 4-10.

[125] Maarten Kuitenbrouwer, "Het imperialisme-debat in de Nederlandse geschiedschrijving," *Bijdragen en Mededelingen betreffende de Geschiedenis der Nederlanden* 113 no. 1 (1998): 56-73; De Jong, *De waaier van het fortuin*.

at the behest of the welfare of the Indonesian population and shook up its mode of operations in the process.[126]

The imperialist fervor in the Netherlands and the United States took place in the atmosphere of international expansionist agitation of the late nineteenth century. Britain and France continued building their vast empires Africa and Asia while new competitors, particularly Germany and later also Japan, joined in the scramble for colonies. Economic interests and Great Power politics provided some of the motives for the imperialist competition. But the colonial ideologies that the Dutch and the Americans articulated and the administrations they set up in their expanding territorial holdings were shot through with moralistic rhetoric: the civilizing missions. This chapter describes the content of those missions and the process through which they were initially articulated. It also describes the shape of the colonial administrations of the Philippines and Netherlands Indies.

[126] De Jong, *De waaier van het fortuin*, 356.

## 2.1. America's mission in the Philippines: 'benevolent assimilation'

In 1898 the Spanish-American War broke out over the fate of the decaying Spanish Empire's overseas territorial holdings in the Caribbean. Spanish rule in Cuba had already a faced series of insurrections in previous decades when it was confronted with an escalating revolution from 1895 onwards.[127] The upheaval threatened the substantial economic interests of American business on the island, while the violent response of the Spanish to the Cuban demands for independence was castigated by the American press. President McKinley, who had assumed office in 1897, also deplored the Spanish failure to come to terms with the Cuban rebellion.[128] In January of 1898 the USS *Maine* was dispatched to the harbor of Havana to demonstrate the continued resolve of the United States to protect its interests on the island. It sank the next month with great loss of life due to an explosion—and though the cause of the blast was unclear, the Spanish were blamed for the sinking by America's sensationalistic "yellow journalism."[129] Spain and the United States had long been on a collision course over Cuba, but now the countries were on a path to war. Spain entered into negotiations in an effort to avert a military confrontation, but in the meantime the McKinley administration commenced preparations for armed conflict. Secretary of the Navy John D. Long and his Assistant Secretary Theodore Roosevelt expanded the theatre of this expected conflict to include the Philippines, and instructed George Dewey, Admiral of the Asiatic squadron, to draw up plans for the taking of Manila.[130]

Negotiations with Spain broke down in April over the American demand for direct involvement in the process of resolving the revolution on Cuba. McKinley signed the declaration of war on April 29th, and in a series of crushing naval defeats the Spanish squadrons in Santiago and Manila were dispatched to the ocean floor. Although the American armies that invaded Cuba faced considerably more resistance, the conflict ended after three months in a decisive American victory—leading it to be called a "splendid little war."[131]

In the period between the occupation of Manila by Dewey and the signing of an armistice in August of 1898 McKinley decided that at least part of the Philippines would be kept under American occupation. His decision to keep a territorial holding in Asia was driven

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[127] Lafeber and Cohen, *The Cambridge History of American Foreign Relations: The American search for opportunity, 1865-1913*, 129-130.
[128] Ibid., 139.
[129] Ibid., 140.
[130] Ibid., 141.
[131] Ibid., 145-146.

by the expected strategic value of the islands for the United States. The Open Door policy that had safeguarded access to the Chinese market was falling apart as the Manchu dynasty crumbled under the pressures of European and Japanese imperialist agitation. America was in danger of being shut out from China, but McKinley hoped that with part of the Philippines serving as a way station for trade and as a forward positioned military base the United States could still pry open China's markets and safeguard the rapidly growing commercial interests in the country.[132] Gradually, coaxed by the French and British who feared that Germany might covet any unclaimed parts of the archipelago, McKinley expanded the American territorial claim by October of 1898 to encompass the entirety of the Philippines. Possession of the islands was transferred from Spain to the United States in the Treaty of Paris concluded in December of that year, in exchange for a 20 million dollar indemnity.[133]

The Cuban rebellion, the sinking of the *Maine*, and the appreciation of the strategic value that an outpost in Asia might provide, were the proximate causes for the war with Spain and the annexation of the Philippines. These proximate causes were themselves the result of the assertive posturing of the United States towards Spain and the interest in territorial aggrandizement, which were the expressions of the rise of militaristic and imperialist sentiments in American society and its political class. A mixture of growing national confidence and concerns over perceived threats to the social order of the United States had in recent years given rise to the belief that aggressive outward expansion was the key towards preserving America's institutions and further enhancing the country's prosperity and standing in the world.

The first discursive space where this mixture was at play was in the sphere of economic thought. The very real emergence of the United States in the 1890s as the world's largest and most productive industrial economy allowed it to throw its weight around in international politics. At the same time a new paradigm stated that economic development was in danger of hitting a plateau, and that the country's capitalism would wilt and its economy be thrown into turmoil unless American producers successfully expanded into foreign markets. The collapse of the Open Door policy and the protectionist barriers that the European powers threw up around their empires raised the question of whether this goal was possible without having imperialism backing the economic expansion—in other words,

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[132] Thomas Mccormick, "From old empire to new: the changing dynamics and tactics of American empire," in *Colonial crucible: empire in the making of the modern American state*, ed. A.W. McCoy and F.A. Scarano (University of Wisconsin Press, 2009), 77.

[133] Lafeber and Cohen, *The Cambridge History of American Foreign Relations: The American search for opportunity, 1865-1913*, 160.

whether alluring foreign markets like that of China literally had to be conquered to be of use to America's producers. Imperialists answered the question in the affirmative, and McKinley showed himself to be of a similar persuasion.[134]

Ideas on gender and race formed the second discursive space where confidence and concern intermixed. These ideas factored into the thinking of members of the political elite such as Henry Cabot Lodge and Albert Beveridge, who went much further in their endorsement of American imperialism than McKinley did. They were convinced that imperialism was necessary to stabilize the societies of so-called "primitive" peoples who they deemed racially inferior and lacking the capacity to govern themselves in an orderly manner. Only then could American business prosper in these otherwise hostile conditions. They asserted that the United States ought to aggressively pursue such an empire to claim its rightful place as a world power and that wars that would have to be fought to demonstrate American superiority; this militarism led them and others who clamored for war to be labeled "jingoes."[135]

The jingoes welcomed warfare as it was instrumental to their strategy of safeguarding American masculinity. Combat could once again instill American men with the vigor that the jingoes, like so many, feared was ebbing away in the 1890s, and ward off the overcivilization that threatened to make the country's men effeminate and weak.[136] It comes as no surprise that Theodore Roosevelt, with his professed belief in the necessity of the "vigorous life", was an exemplary member of the jingoes: he resigned as Assistant Secretary of the Navy and led his volunteer Cavalry regiment up San Juan Hill during the taking of Cuba. His exploits during the Spanish-American War cemented his reputation with the public, and campaigning on his heroism in the December elections held in the same year as the war he secured the seat of governor of New York.[137]

A strong lobby of anti-imperialists in the United States vehemently opposed the likes of the jingoes and their imperialist schemes. According to their laissez-faire views, business did not need to operate under the protective umbrella of imperialism and the high costs that military protection entailed.[138] More specific to the case of the Philippines was the campaign of Anti-Imperialist League, founded in 1899, which opposed annexation of the archipelago on moral grounds. They feared that adding the Filipinos to the American body politic would

[134] Mccormick, "From old empire to new," 68, 71.
[135] Hoganson, *Fighting for American Manhood*, 37, 119.
[136] Ibid., 134.
[137] Bederman, *Manliness and Civilization*, 191-192.
[138] Mccormick, "From old empire to new," 70.

make the already fraught racial relations in the Republic even more problematic.[139] Their assumptions on the brutality and primitive state of society in the Philippines were similar to those of the imperialists, but their conclusions were different: instead of acting as a moral gymnasium where virile men could grow their character, the "antis" warned that colonial warfare would breed depravity among the American soldiers and degenerate the quality of their race for generations to come and debase the nation in the process.[140] More fundamentally, they saw the coercive imperialist project in the Philippines as an affront to the American constitution and a dangerous departure from the nation's democratic traditions.[141]

The plan for annexation was strongly opposed in the Philippines too. Led by Emilio Aguinaldo, Filipinos had rebelled against Spanish rule in the years prior to Dewey's taking of Manila. Aguinaldo's forces controlled all of the Luzon island with the exception of the port city held by Dewey, and in June of 1898 he had proclaimed a Philippine Republic with himself as its president. The good relations with the Americans, in whom the Filipinos saw supporters for their independence, soured as McKinley became more enamored with the seizing of their territory. When the imperialists in Washington moved to annex the Philippines following the Treaty of Paris, a costly guerilla war broke out in February of 1899.[142] The commitment of the US army peaked at more than 70,000 soldiers in 1901, the year Aguinaldo was captured, with over 120,000 Americans serving at one time or other during the conflict. The war dragged on for two more years when it ended in an American victory, and was estimated to have cost the lives of up to 4,000 American soldiers, tens of thousands of Filipino combatants, and hundreds of thousands of civilians who died of the famine and disease that followed in the wake of the chaotic warfare.[143]

McKinley had sent out the "Philippine Commission" in January of 1899 to answer the question of how the new acquisition ought to be governed. The Secretary of War Elihu Root, whom the president had appointed in late 1899 and who was tasked with pacifying the archipelago, also contributed to the structuring of the administration. Some of the antis' concerns filtered through into Root and the Commission's policies that defined the relationship between the archipelago and the American metropole. The rights granted by the

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[139] Lafeber and Cohen, *The Cambridge History of American Foreign Relations: The American search for opportunity, 1865-1913*, 162.
[140] Hoganson, *Fighting for American Manhood*, 182.
[141] Ibid., 156.
[142] G.A. May, *Social engineering in the Philippines: the aims, execution, and impact of American colonial policy, 1900-1913* (Greenwood Press, 1980), xxiv-xxvii.
[143] Adas, *Dominance by design*, 134.

constitution and American citizenship were not extended to the Filipinos,[144] and no colonial office was set up in Washington along the lines of the European imperial competitors.[145] Instead, the affairs of the territories gained in the Spanish-American War were administrated by the Bureau of Insular Affairs which fell under the aegis of the Department of War.[146]

Root and the Commission had to create the colonial bureaucracy almost whole-cloth.[147] They looked to the methods of administration used by the Dutch and the British in hopes of finding models worth emulating, but found them wanting. The use of local elites as intermediaries for colonial rule in India and the Netherlands Indies could not be implemented in the Philippines where such a class was absent.[148] More importantly, from the moment that he decided to annex the archipelago, McKinley had outlined a series of objectives for American rule that he intended to be fundamentally different from those of the European colonies. He found willing collaborators in Root and the members of the Commission. At the heart of their program was the idea that administration of the United States over the archipelago was to be temporary and oriented towards improving the welfare of the indigenous population. This stood in stark contrast to what they saw as the extractive objectives of Anglo-Dutch colonialism. The Americans therefore thought of their benign goals in the Philippines as being a testament to the exceptionalism of their nation.[149]

It can be adduced from the rhetoric of the key players in the American policy-making class that they were in agreement on the civilizing mission their nation had to fulfill. McKinley had couched his decision to annex the islands in the rhetoric of “guardianship”, implying that development rather than domination was his ultimate goal for the territories.[150] Root also sought to establish that the American sovereignty over the Filipinos was geared towards preparing them for self-government and spreading civilization to the islands.[151] William Howard Taft, who was asked by McKinley to head the Second Philippine Commission and to further implement what the latter had dubbed the policy of “benevolent

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[144] Go, "Introduction: global perspectives on the U.S. colonial state in the Philippines," 7-8.
[145] Mccormick, "From old empire to new," 73.
[146] Francisco A. Scarano Alfred W. Mccoy, Courtney Johnson, "On the Tropic of Cancer: transitions and transformations in the U.S. imperial state," in *Colonial crucible: empire in the making of the modern American state*, ed. A.W. McCoy and F.A. Scarano (University of Wisconsin Press, 2009), 24.
[147] Patricio N. Anibales, "Progressive-Machine conflict in early-twentieth-century U.S. politics and colonial state building in the Philippines," in *The American colonial state in the Philippines: global perspectives*, ed. J. Go and A.L. Foster (Duke University Press, 2003), 171.
[148] N.A. Bootsma, *Buren in de koloniale tijd: de Philippijnen onder Amerikaans bewind en de Nederlandse, Indische en Indonesische reacties daarop, 1898-1942* (Foris Publications, 1986), 9.
[149] Michael Adas, "Assumptions of United States Exceptionalism in the Colonisation of the Philippines," *Itinerario* 22 (1998): 44–66, 46.
[150] A.P. Dudden, *The American Pacific: From the Old China Trade to the Present* (Oxford University Press, 1994), 82-84.
[151] Go, "Introduction: global perspectives on the U.S. colonial state in the Philippines," 11.

assimilation,"[152] used the Progressive rhetoric of the time to describe the task that the Americans had set themselves as one of "uplifting" the people of the islands.[153]

These men, all members of the Republican party, faced tough opposition from the antis who rallied behind the Democratic presidential hopeful William Jennings Bryan for the 1900 election. Believing that imperialism would be the dominant campaign issue, McKinley firmly embraced it when he selected its staunch supporter Theodore Roosevelt as his running mate.[154] Roosevelt had expressed his agreement with the expansionist exhortations of Rudyard Kipling's poem "The White Man's Burden" – carrying the subtitle "The United States and the Philippine Islands" – that the Americans had an obligation to spread civilization.[155] During the campaign Bryan gradually abandoned the imperialism theme when he could not make electoral hay of the issue, but ended up losing to the McKinley-Roosevelt ticket nonetheless. Less than a year later, on September 6th, McKinley was fatally injured by the bullets fired by the anarchist Leon Czolgosz. Eight days later McKinley succumbed to his wounds, and Roosevelt took up the office of President of the United States.[156]

Taft, who had been solicitor general in the United States and at the time of McKinley's request served as a judge on the sixth circuit court, had been sworn in two months earlier on July 4th 1901 as the governor of the first civil administration of the islands. The Philippine Commission's program for what has later been described as the "social engineering"[157] of the colony rested on three pillars: the education, economic development, and democratic tutelage of the Filipino people. These would prepare them for eventual independence.[158]

In much of the historiography these three tenets have figured as the core of the civilizing mission of the United States in the Philippines—with a particularly large share of the attention in the literature being devoted to the mission's apparent emphasis on education. The ambitious nature of the educational agenda and the swiftness with which it was implemented are certainly deserving of emphasis. The administration had offered high wages to attract teachers in the metropole and could choose from thousands of applicants; those who had been selected began arriving as early as June of 1901, with the arrival in August of the more than five hundred teachers carried by the army transport *Thomas* being a particularly

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[152] Dudden, *The American Pacific*, 89.
[153] Go, "Introduction: global perspectives on the U.S. colonial state in the Philippines," 12.
[154] Lafeber and Cohen, *The Cambridge History of American Foreign Relations: The American search for opportunity, 1865-1913*, 178-182.
[155] Bederman, *Manliness and Civilization*, 187.
[156] Lafeber and Cohen, *The Cambridge History of American Foreign Relations: The American search for opportunity, 1865-1913*, 178-182.
[157] May, *Social engineering in the Philippines*.
[158] Ibid., xvii.

noteworthy event.[159] The school system in the Philippines succeeded in serving a much larger share of the indigenous population than the systems operating in the European colonies in Asia, although the daunting size of the task and problems with funding ultimately blunted the effectiveness of the educational policy.[160]

More overtly successful, at least from the perspective of the American rulers who sought to minimize the nationalistic sentiments that had powered the guerilla, was the pillar of democratic tutelage. The first local elections were held in 1902, and five years later votes were cast for a Philippine Assembly, although suffrage was extended to only a small sliver of the population.[161] Nevertheless, the Assembly proved a cooperative institution and, aided by a rapidly expanding civil service that provided upward mobility for the educated Filipinos, tied indigenous elites into the state-building project of the Americans. In combination with the commitment to eventually withdraw from the archipelago, the early institution of an elected deliberative body has been credited with preventing the kind of restive political atmosphere that developed in other contemporary Asian colonies.[162]

In a departure from the historical narratives that emphasized education, Michael Adas has argued that an "engineers' imperialism … came to dominate the colonial project in the islands."[163] The influence of the engineers over the administration's policies began immediately in 1901 when control over the colony was transferred to the civilian administration. The colony's thirty-seven provinces were governed by three-man boards, and in each of them a civil engineer acted as a supervisor. In that capacity their control over policy was considerable, as they decided which infrastructure should be constructed and how the public space should be modernized.[164] Also, after 1907 the boards were invested with additional tax collecting powers to fund public works, giving the engineers greater financial resources.[165] The previous year each province had been furnished with a district engineer to oversee infrastructure development in the territory. The lack of an overarching strategy for the

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[159] May, *Social engineering in the Philippines*, 85.
[160] Ibid., 123-124.
[161] Vince Boudreau, "Methods of domination and modes of resistance: the U.S. colonial state and the Philippine mobilization in comparative perspective," in *The American colonial state in the Philippines: global perspectives*, ed. J. Go and A.L. Foster (Duke University Press, 2003), 268.
[162] Ibid., 263.
[163] Adas, *Dominance by design*, 179. The text mentions 'twenty-seven' provinces, but this number was in fact thirty-seven: thirty-one administered under the Provincial Government Act and six administered under the Special Government act, as mentioned in W. Cameron Forbes, "Letter of the Secretary of Commerce and Police to all provincial, municipal, and other officials relative to the present road policy in the Philippine Islands," Manila, June 16th 1908; Public Works; General, 7152; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.
[164] Ibid., 145.
[165] C.B. Elliott, *The Philippines to the end of the commission government: a study in tropical democracy* (Greenwood Press, 1968), 283.

development of the Philippine economy[166] – likely a factor for the discounting of this pillar of the civilizing mission in much of the historiography, which has tended to focus on education and democratic tutelage instead – meant that engineering projects took place in a semi-haphazard fashion, further empowering the engineers who stood at the helm of the construction works.[167]

Initially, the engineers were spread out over the provincial administrations and, after 1902, over the Bureau of Engineering and Construction of Public Works and the Bureau of Engineering and Construction of Public Buildings. The Bureau of Public Works set up in Manila in 1905 brought the colonial engineers together in a single bureaucracy which answered to the Commissioner of the Police, a member of the Philippine Commission. As the primary institution concerned with the development of the infrastructure of the islands, the Bureau was deemed to be of great importance by the members of the Commission, who saw it as a tool to directly affect the material prosperity of the archipelago's population. How the relationship between Bureau, Commission, and the larger colonial state apparatus played out will be detailed in the second part of this study.

[166] May, *Social engineering in the Philippines*, 129.
[167] Adas, "Improving on the Civilizing Mission?," 53.

## 2.2. The Dutch mission in the Indies: *Ethische Politiek*

Dutch involvement in the affairs of the Indonesian archipelago stretched back almost three hundred years by the close of the nineteenth century, dating back to the first voyages of the Dutch East India Company. Yet despite this long presence, the territorial extent of the colonial rule of the Netherlands was only limited, and in some respects a recent imposition: only by 1830 could the colonial state truly claim to control the island chain's most populous island of Java, whereas its power over the outer islands within its territorial claim still ranged from slight to non-existent.[168]

But Java, home to four out of every five inhabitants of the Indies, made the colony an enormously profitable prize for the Netherlands. The *cultuurstelsel* (cultivation system) that was put in place after 1829 mandated that the island's villages reserve part of their areal for export crops, such as coffee and sugar, to pay the hefty tax that the colonial government demanded from its inhabitants. The profits of the *cultuurstelsel* were remitted to the state coffers of the Netherlands where it provided about one fifth of all government revenue in the first decades of its operations, even peaking at close to a third in the 1851-1860 period.[169] The Dutch relied on the existing feudal relations on the island to make their extractive practices work, developing a symbiotic relationship between the colonial government and the indigenous aristocracy. The dominant administrative unit was the Regency, led by the aristocratic *bupati* or *regent* in Dutch. The regents, in return for a share of the profits and the Dutch support of their rule, and their lower-level intermediaries saw to the delivery of the required amount of export crops. This *Inheemsch Bestuur* (Indigenous government) was overseen by the Dutch *Binnenlands Bestuur* (BB, Domestic government) who appointed *residenten* (Residents) to oversee the governance of the regencies. The Residents were charged with overseeing the financial affairs of the regencies they had been assigned to and promoting the local agricultural production, as well as being responsible for the maintenance of the roads and irrigation infrastructure.[170]

The *batig-slotbeleid*, or *net-profit system*[171], that the Netherlands pursued to fund the activities of the ambitious but cash-starved metropolitan government (which engaged in enormous public works projects throughout the nineteenth century) meant that Java was run

[168] M.C. Ricklefs, *A history of modern Indonesia, c. 1300 to the present* (Indiana University Press, 1981), 125.
[169] Ibid., 117.
[170] H.W. Van Den Doel, *De stille macht: het Europese binnenlands bestuur op Java en Madoera, 1808-1942* (B. Bakker, 1994), 48.
[171] This translation is lifted from Clive Day, *The Dutch in Java* (New York: The Macmillan Company, 1904).

like a huge plantation. The incentive structure for its rulers was therefore structured to achieve optimal production: Residents who succeeded in increasing the production of export crops could look forward to a larger cut from the profits. The regents, whose relationship with the BB came to resemble an "alliance"[172], also received pecuniary benefits by increasing the profits that the Dutch rulers reaped.[173] By mid-century the extractive prerogatives of the cultivation system began creating perverse outcomes: areal was reserved for export crops where rice had previously been grown, diminishing the amount of food available for sustenance and leading to occurrences of famine. In 1860 the former assistant-Resident of Lebak, Eduard Douwes Dekker, unleashed a withering critique of the exploitative nature of Dutch rule in the archipelago under the pseudonym *Multatuli* with his novel *Max Havelaar*. Multatuli was a staunch believer in the necessity of Dutch colonialism in the archipelago, but sought to curb its excesses. Despite having no immediate effects, the *Max Havelaar* is considered to have been a first step towards the reforms that led to the gradual dismantling of the cultivation system and its replacement with a less coercive economic regime in the 1870s.[174]

The end of the cultivation system had in part been brought about by the liberal attitudes gaining favor in the Netherlands, and the hope that the adoption of a liberal trade regime in the colony might bring greater profits—because the *batig slot* was still highly necessary.[175] Accordingly, the feudalism on which the Dutch rule had relied on fell in disfavor, and the BB gradually increased its power vis-à-vis the old regent aristocracy. The power of the aristocracy was further hollowed out as the expanding Dutch bureaucracy attracted a new group of indigenous officials. These local bureaucrats, drawn from the higher socio-economic classes, were inducted into the existing *priyayi* class of administrative elites through a merit-based system, and in part supplanted the old aristocrats as the BB's most important indigenous allies.[176]

The decade of the 1870s was also the time when more efforts were made by the colonial state to extend its zone of control to the outer regions where the Dutch, at least nominally, exercised sovereignty. Economic imperatives to an extent drove this effort: Java's population had surged and its soil was being exploited intensively; new land had to be opened

[172] De Jong, *De waaier van het fortuin*, 207.
[173] Ibid., 208.
[174] Ibid., 275-278.
[175] Ibid., 300.
[176] Ricklefs, *A history of modern Indonesia*, 122-123.

up.[177] The reach into Sumatra encountered resistance from the state of Aceh, located on the island's north-western fringe along the strategic Malacca Straits, and a series of expeditions were launched in 1873 and 1884. These proved expensive but ineffective. The campaign led by J.B. van Heutsz, who brought new military tactics, strategy, and technology to bear on the conflict, pacified the region between 1898 and 1904.[178] Military power brought the other outer regions under control in the same period, and the colonial bureaucracy fanned out over the archipelago in the wake of the soldiers and together with the expanding economic interests in the island chain. At the dawn of the new century the BB and its administrators stood at the peak of their power.[179]

The gradual reforms of the structure of Dutch rule in the Indies did not allay the concerns of those who witnessed the continuing the socio-economic deprivation of the indigenous population. The journalist Pieter Brooshooft, the editor of several blossoming newspapers in the colony, criticized the plantation-like operation of the colonial state and expressed concern for the continued poverty of the indigenous population, comparing the Indies to a patient being bled dry and in danger of perishing. He contended that the government of the Netherlands had a moral obligation to return the profits extracted as part of its *batig slot* policy to the archipelago, calling it an *ereschuld* in an 1890 article—a "debt of honor." But his call for a new moral foundation for the governance of the colony, a foundation which he called the *Ethische Politiek* or Ethical Policy, elicited no response from the government.[180]

Brooshooft had simply spoken too soon. When his friend C.Th. van Deventer expressed the same ideas in the same terms with his article "*Een Eereschuld*" published in 1899 in the influential periodical *De Gids,* they received a warm welcome. What Van Deventer added to Brooshooft's rhetoric was a three-pronged approach for improving the conditions of the Indonesians: emigration (from overpopulated Java to the outer islands), irrigation, and education.[181] Buoyed by the increasingly successful military campaigns throughout the archipelago, the time was considered ripe for a more ambitious social agenda in the colony.[182] The breakthrough of social liberalism in the Netherlands and the fresh ideological support for interventionist government policies further strengthened the appeal for

[177] De Jong, *De waaier van het fortuin*, 333.
[178]Ricklefs, *A history of modern Indonesia*, 137-138.
[179] De Jong, *De waaier van het fortuin*, 353.
[180] Ibid., 356.
[181] Van Doorn, *De laatste eeuw van Indië*, 149.
[182] De Jong, *De waaier van het fortuin*, 356-357.

developing the island chain.[183] The paternalistic message of uplifting and civilizing the working classes in the metropole was thus extended to the indigenous peoples of the colony.[184]

The new government that came to power in the Netherlands in 1901 took up the Ethical Policy as an article of faith in its plans for the Indies and that year, in her annual speech from the throne, Queen Wilhelmina expounded on the responsibilities and moral duties of the Dutch towards their colonial subjects.[185] The cabinet's Minister of Colonies A.W.F. Idenburg internalized the Ethical Policy's message of uplift and was convinced of the need to change governmental structure accordingly. Power was to be devolved down from the centralized colonial state apparatus and the educational agenda would serve to emancipate the Indonesians, and a separation of the metropolitan and colonial finances – ending the *batig slot* – could provide the financial firepower to achieve the material and spiritual uplift of the colonial subjects.[186]

Van Doorn expressed surprise in his study of the role of engineers in the governance and development of the Indies colony that they were underrepresented in the debate on the course of the Ethical Policy. The principal players came mostly from the legal profession and had been employed in various positions throughout the colonial government.[187] The exception was lower house representative Henri Hubertus van Kol, who had graduated from Delft as an irrigation engineer in 1875.[188] He had enrolled in hopes of starting a career in the Indies, and after completing his studies he successfully secured a position in the colony, making landfall in the archipelago in 1876. He brought with him the intellectual baggage of socialism, of which he had become a convinced follower early on during his time at Delft. Writing under a pseudonym he actively partook in several debates in the colony's Dutch periodicals and published several editorials. He took the opportunity during his furlough in 1885 to travel to Belgium to attend the founding of the country's Labour Party; in 1894, during a second furlough, he would act as one of the founding members of the Social-Democratic Labour Party (SDAP) in his own country. When he was rejected in the following year for returning to service in the tropics because he did not pass the requisite medical test – despite being

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[183] Frances Gouda, "Mimicry and Projection in the Colonial Encounter: The Dutch East Indies/Indonesia as Experimental Laboratory, 1900-1942," *Journal of Colonialism and Colonial History* 1, no. 2 (2000): 16.
[184] Gouda, "Mimicry and Projection in the Colonial Encounter," 18-19.
[185] De Jong, *De waaier van het fortuin*, 358.
[186] Ibid., 358-359.
[187] Van Doorn, *De laatste eeuw van Indië*, 149-150.
[188] Johanna M. Welcker, "Kol, Hendrikus Hubertus van," in *Biografisch woordenboek van het socialisme en de arbeidersbeweging in Nederland*, ed. P.J. Meertens, M. Campfens, and G. Harmsen (Centraal Boekhuis, 1998), 116-123.

convinced of his own clean bill of health, which he secured with a second opinion he had demanded – he decided to run for parliament instead.[189]

With the 1897 election Van Kol took his seat for the SDAP in the lower house where he acted as a staunch critic of the Dutch colonial practices. He belonged to the so-called Indies Specialists who could draw on their own experiences in the colony to deliver expert analyses and incisive critiques of colonial policy. Van Kol sharply opposed imperialist expansion in general and, from his own experiences, the "Dutch annexation-fanaticism" of Aceh in particular. These costly military campaigns diverted funds from what he saw as the real moral duty of Europeans: the material development through public work construction of the "primitive and ignorant peoples", whom the European had a moral duty to uplift. Van Kol thus drew a sharp dichotomy between imperialism and colonialism, rejecting the former and favoring the latter. He articulated his vision for a social-democratic colonial policy at the *Congrès International de Sociologie* held in Paris in 1900 and in the reports compiled in its wake, comparing the task of developing the colonized peoples to tutoring a child to become a man.[190] The engineer Van Kol saw technology as the tool to achieve this goal.[191]

Van Kol was a minority in his perception that the Dutch were engaged in "annexation-fanaticism." According to the historian J.J.P. de Jong, the political rhetoric in the Netherlands during the late nineteenth century sharply distinguished between imperial powers like France and Britain on the one hand, which were engaged in an expansionist scramble for territory, and the deepening of Dutch control within the recognized and respected borders of its Indies colony on the other. The fin-de-siècle Dutch thus ascribed to their activities in the colony a certain degree of exceptionalism, seeing it as the result of a colonialist rather than an imperialist program. Much of the historiography followed this belief that the Dutch had a status apart from the other European powers until the 1980s, when a debate broke out on the applicability of the "imperialism" heuristic to Dutch colonial practices. It was settled in the mid-1990s with the conclusions drawn by Maarten Kuitenbrouwer: the Netherlands were engaged in an expansionist project, but, uniquely, this imperialism took place within the boundaries of a recognized sovereignty over a region.[192]

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[189] H.W. Van Den Doel, "Hubertus de Onstuimige: de reizen van Henri van Kol door de Nederlandse koloniën, 1902-1903," in *Kerk, cultuur en koloniën: opstellen over Nederland rond 1900*, ed. B. Boom and F.S. Gaastra (Amsterdam: Balans, 2005), 202-203.
[190] Van den Doel, "Hubertus de Onstuimige," 201.
[191] Adas, *Machines as the measure of men*, 230.
[192] De Jong, *De waaier van het fortuin*, 319-321; Kuitenbrouwer, "Het imperialisme-debat in de Nederlandse geschiedschrijving."

Even more recent is the spate of literature investigating the role of technology and engineers in shaping Dutch imperialism—a pendant to Adas's research on engineers in the Philippines. Van Doorn had already drawn attention to the fact that engineers were a distinct group within the colonial administration. The historian Wim Ravesteijn later pointed out that even though the BB had steadily been increasing its power against the indigenous political classes with the reforms that they set in motion in the 1870s onwards, the *Bureau Openbare Werken* (Bureau of Public Works, BOW) in Weltevreden had made significant strides in separating themselves from the authority of the other civil servants in the Indies. This was particularly true for the engineers working in the field of irrigation management. In an 1885 proclamation, the so-called *waterstaatsreglement*, BOW was reorganized. The new institutional structure, the *Indische Waterstaat* ("Indies Water-state", the colonial counterpart to the *Rijkswaterstaat* of the Netherlands), that emerged in the years after the proclamation attached great importance to the technical and scientific aspects of irrigation, and gave the irrigation engineers a large degree of operational independence and direct access to the funding mechanisms of the colonial state. This enhanced the status and power of the engineer corps, and by the close of the nineteenth century they launched the massive Solo works, which, in the colonial space, were almost unique in scale and ambition: the Solo river, the largest on Java, was to have its delta rerouted and thousands of acres of areal were to be irrigated by large canal systems.[193]

Following Van Doorn's lead in thinking of the colony as a "project", Ravesteijn edited a collaborative study in an effort to provide an overview of the distinct engineering projects in the Indies, such as the construction of deepwater ports, railroads, and sanitation works.[194] Harry Lintsen, the most prominent historian of engineering in the Netherlands, was one of the instigators of this study, and in turn chaired another research project of his own that mapped the impact of various technologies, particularly in the sphere of agricultural practices, on the Dutch civilizing mission in the colony.[195] In this recent research on engineering in the Indies colony the first two decades of the twentieth century are described as a "golden age"[196] for

[193] Wim Ravesteijn, *De zegenrijke heeren der wateren: Irrigatie en staat op Java, 1832-1942* (Delft University Press, 1997), 148.
[194] W. Ravesteijn and J. Kop, *Bouwen in de Archipel: burgerlijke openbare werken in Nederlands-Indië 1800-2000* (Walburg Pers, 2004). Also available in English as W. Ravesteijn and J. Kop, *For profit and prosperity: the contribution made by Dutch engineers to public works in Indonesia, 1800-2000* (Aprilis, 2008).
[195] The published results of the project led by Lintsen, titled "Technology and the Civilizing Mission: Dutch Colonial Development in the European Context, 1870-1970" and running from 2003 to 2008, are listed on the website of the *Nederlandse Organisatie voor Wetenschappelijk Onderzoek* at http://www.nwo.nl/projecten.nsf/vk2008/ned/1700115884. Accessed: November 3rd 2011.
[196] Ravesteijn and Kop, *Bouwen in de Archipel*, 42.

the engineers. Between 1898 and 1918 the number of civil engineers employed by the colonial government grew from 92 to 201.[197] The overall growth of the profession made such an expansion possible, also because the trend that had set in during the mid-nineteenth century that a little over a quarter of all Delft graduates went on to find employment in the colony continued—a significant portion in any regard![198]

The enormous economic boom that began with the take-off of business investment in the colony after 1905, and which would increase exports seven-fold in less than a decade and a half, also drew many other Dutch to the Indies.[199] These new arrivals, called *totoks*, found a colonial society that was at once both hybridized and divided ethnographically. The Dutch in the colony distinguished themselves from the indigenous population by identifying themselves as part of a "European" class in society, which had a separate civil status. Despite the fact that generations of intermarriage between the colonizer and colonized in the archipelago had given birth to a cohort of "Europeans" who looked very different from the pale-skinned arrivals from the Netherlands, the former still clung to their whiteness and the privileges it afforded them. The privileges these so-called *Indos* enjoyed went beyond the mere pragmatic legal benefits that being "white" accorded them. Those who could don the mantle of whiteness used it as the basis of their sense of superiority vis-à-vis the indigenous population.[200]

"Whiteness" also held benefits for the *totoks*. In the confused class relations of the colony, where the rules of the metropole no longer applied and upper- and lower class mixed in colonial outposts and on the office floor, whiteness afforded a new solidarity: the *noblesse de la peau* or "nobility of the skin."[201] This racialized aristocracy was gendered too: men could pass on their whiteness to their children, whereas women could not. The influx of new immigrants from the Netherlands – especially the women, who for the first rime arrived in large numbers – introduced new stresses to this ethnographic division of the colonial society by threatening the status of the mixed-race *Indos* of the archipelago with status erosion as the number of Europeans grew. The resilience of the old system nonetheless makes it fair to say that the recent arrivals to the Indies did not simply import the racial attitudes of the metropole but instead were for the most part absorbed into the existing social hierarchy of colonial

[197] Ravesteijn and Kop, *Bouwen in de Archipel*, 41.
[198] Van Doorn, *De laatste eeuw van Indië*, 117.
[199] De Jong, *De waaier van het fortuin*, 401-402.
[200] Gouda, *Dutch Culture Overseas*, 162-165.
[201] Ibid., 164.

society.[202] The Dutch engineers who made the trip to their new positions in the colony were thus confronted with this mesh of gendered, racialized, and classed social relations in the Indies, thus further complicating the gendered and classed identity formation process that, as we have seen, they so actively pursued in the Netherlands.

[202] Gouda, *Dutch Culture Overseas*, 162-165.

## 2.3. Similar civilizing

The United States and the Netherlands each embarked on new colonial programs and civilizing missions in the years between 1898 and 1901: benevolent assimilation and the Ethische Politiek, respectively. At first glance these programs arose out of very different causes. The Spanish-American war had led McKinley to unexpectedly take control of the Philippines, whereas the writings of Van Deventer fit in a longer tradition of critiquing the excesses of Dutch rule in the Netherlands Indies. In addition, the long history of the Dutch presence in the Netherlands Indies points in the direction that the Dutch colonial state could draw on a long tradition of rule whereas the Americans in the Philippines could not. In fact, the introduction of a modern colonial state in the Netherlands Indies and the extension of control over the outer islands in a painful guerilla war took place almost contemporaneously with the American entry into the Philippines and the conflict with Aguinaldo and his supporters. Upon studying the long-term trends in Dutch and American society, as well as the rhetoric used by the leading participants on colonial policy in either country, a series of similarities become readily apparent.

The civilizing mission gained the support of the polities in both metropoles because of the ascent of the politics of interventionism in either country. American Progressivism and Dutch social liberalism, both amenable to engineering rhetoric, went overseas. As the paternalist assumptions that the reformers in the Netherlands and the United States evinced towards the working classes they wished to “uplift” in their own countries were transferred to the colonial context, they became racialized: the colonial subjects were portrayed as savages. The rhetoric of the proponents of benevolent assimilation and the Ethical Policy was shot through with references to the supposed moral duty of civilized nations such as the Dutch and Americans to bring civilization to what they perceived as the world’s primitive peoples.

Separated by only a few years, but by thousands of miles and political differences that were no less wide, Taft and van Kol both described the role that their respective nations ought to fulfill towards their subject peoples as that of a “guardian.” They made use of a metaphor prevalent in the colonialist discourse on both sides of the Atlantic which stated that the colonized subject was like a child in need of tutelage, so that it might one day become an

adult.[203] This metaphor performed three roles. First, it meant that the Filipinos and Indonesians could not rule themselves – they were simply not yet ready for independence. Second, it established a hierarchy between them and the colonizers, establishing the latter's superiority. Third, it positioned the duty to be performed by the Dutch and the American in their colonial archipelagoes in moral terms: leading a child into adulthood was the expression of the morality that underpinned the benevolence and ethics of their colonial programs.

As would befit the role of a good parent, education was a major pillar in both the Ethical Policy and the policy of benevolent assimilation. However, large sums in the colonial governments' annual budgets in the Philippines and the Netherlands were reserved for public works projects. The civilizing mission thus did not merely hope to bring civilization through a spiritual transformation of the subject peoples; it sought to achieve this goal through a change in their material conditions as well. In the case of the Netherlands, Bloembergen and Raben have asserted that the search for order and systematization in the metropole, which Auke van der Woud has shown was so closely tied to the transformation of the public space by the engineers, was transplanted to the colonial sphere.[204] Michael Adas described the material transformation the Americans hoped to achieve in the Philippines as driven by an expansionism motivated by "technological imperatives"—i.e., the sense of obligation to act upon the possibilities made available by new technology.[205]

The rapid technological development that followed industrialization in the Netherlands and the United States, and the changes it wrought in the material cultures of these and other predominantly Western countries it affected, thoroughly transformed the Western societies in the late nineteenth century. The first chapter of this study showed to which political ideas the Dutch and Americans turned to cope with the pressures of onrushing modernity, such as greater government interventionism and the according of an important role for trained experts in the emerging bureaucracies.

But the scientific and technological accomplishments of the era also transformed the outlook of them and other Westerners of their place in the wider world. Throughout the nineteenth century, scientific attainments gradually developed into the yardstick against which societies were compared and were used as indicators for the level of civilization of peoples.

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[203] Hoganson, *Fighting for American Manhood*, 201; H.W. Van Den Doel, "Hubertus de Onstuimige: de reizen van Henri van Kol door de Nederlandse koloniën, 1902-1903," in *Kerk, cultuur en koloniën: opstellen over Nederland rond 1900*, ed. B. Boom and F.S. Gaastra (Amsterdam: Balans, 2005).
[204] M. Bloembergen and R. Raben, *Het koloniale beschavingsoffensief: wegen naar het nieuwe Indië, 1890-1950* (KITLV Uitgeverij, 2009), 10.
[205] Adas, *Dominance by design*, 6-13.

The hierarchy that was thus established affected the behavior of actors on either side of this asymmetry.[206]

The historiography has taken close account of the role of technology for late nineteenth century imperialism. Daniel Headrick described various "tools of empire", such as steam powered ships, railways and the telegraph, that not only made the late nineteenth century European burst of imperialist fervor possible but also changed the motives of the European wielders of these tools.[207] In the context of the civilizing mission, these technologies became the tools of civilizing. Engineers were placed in positions of power within the administrations that governed the colonies and exercised influence over how those tools ought to be used. Technology, after all, does not speak for itself—the meanings technological artifacts convey are socially constructed, as are the shapes these artifacts take.[208] Engineers had privileged access to the processes that imbued technologies with meaning. They leveraged their image as voices of science and reason to support particular applications of technology over others, staking their reputations on some projects while opposing others. Their continuous fashioning of themselves as trustworthy, reputable experts has led them to being called "empire-builders: active agents of political and economic empire."[209] We now turn to how this process of empire building played out in the Netherlands Indies and the Philippines.

[206] Adas, *Machines as the measure of men*.
[207] D.R. Headrick, *The tools of empire: technology and European imperialism in the nineteenth century* (Oxford University Press, 1981), 10-11.
[208] W.E. Bijker, T.P. Hughes, and T.J. Pinch, *The Social construction of technological systems: new directions in the sociology and history of technology* (MIT Press, 1987).
[209] B. Marsden and C. Smith, *Engineering Empires* (Palgrave Macmillan, 2007), 1.

# Part 2: Daedalus in the tropics

## 3. Method and vignettes

In the first part of this study I have shown how the political landscapes of the Dutch and American metropoles were transformed as a growing faith took hold in both societies technology could be applied to guide social progress, and that governmental interventionism could be used to promote general welfare. This transformation played into the hands of the rising class of technologists – the engineers – who in both countries were engaged in a campaign to improve their social status by fashioning themselves as a rationally minded and politically independent professional class. This process of self-fashioning was geared towards positioning themselves as the providers of solutions to questions of governance that were supposedly superior to those offered by the existing political elites, who disproportionately had been trained as legal experts. At times the engineers also found support in the new political movements of American Progressivism and Dutch social liberalism that co-opted their rhetoric. Engineers took up positions of influence in the governing cabinets of the Netherlands and urban administrations throughout the United States. In the expanding bureaucracies of the modernizing states they contributed towards the formulation of policy. The engineers' bid for greater social authority and professional independence pointed the way towards a political system run by engineering experts: the technocracy.

Technocratic rule was not achieved in either metropole. But the articulation of the new civilizing missions of the Netherlands and the United States, which were predicated on the belief that Western technological superiority made it the duty of the Dutch and Americans to spread the tenets of modern science and technology to what they deemed to be primitive peoples, provided a new space where engineers could strive for such power. In the second part of this study I will present a series of cases where the technocratic ambitions of the American and Dutch colonial engineers were operative. By comparing and contrasting their rhetoric in these cases, those aspects that were shared or particular to the projects of the colonial engineers in the Philippines and Netherlands Indies will be elucidated.

Rather than attempting to weave a single narrative out of these case studies, I treat these cases as vignettes that are emblematic of various tendencies of the American and Dutch engineers in their colonies. These tendencies will be teased out from the discursive productions of the colonial engineers: from articles in professional journals, letters submitted

to periodicals, circulars to government agencies, and speeches at commencement ceremonies and other festivities. The authors of these discursive productions made use of the prevalent ideas on race, gender, class, technology, and civilization of their day – and the power these ideas granted to their wielders – to claim authority in the colonial space. In so doing, they built up a shared vocabulary and a collection of rhetorical gestures.

However, the meanings of these signifiers were not uncontested, as we have already seen: whereas the presumed "primitivism" of the Filipinos necessitated the guardianship of the Philippines according to the American imperialists, that same primitivism also produced the vehement opposition to annexation of the antis. And with "Java", the Dutch projected an image of the island to American visitors that portrayed the island as a "Garden of Eden", while at the same time the impoverishment of the indigenous population was decried by critics of the prevailing methods of Dutch rule such as Van Deventer and Brooshooft.

I contend that the rhetoric of the participants in these debates cannot be discounted as opportunistic or out of touch with reality. In this sense I follow the methodological courses charted by Gail Bederman, Kristin Hoganson, and Michael Adas.

Bederman argued that, to reiterate, "the ideas comprising any discourse will be multiple, inconsistent, and contradictory"[210]; i.e., that a word such as "primitivism" may be invoked for different purposes. Therefore, no hegemonic meaning of a discourse can be constructed—instead, it is necessary to continually reassess its content to lay bare the roles it has performed in various settings, and the power it conveyed upon its user.

The truths that engineers held self-evident, and their intentions to act on these truths, can be found by closely studying the conditions in which they used their rhetorical gestures and by contextualizing them in the broader web of ideas and assumptions of their users. Hoganson explained that in her view "[rhetoric is] something that illuminates motivations, convictions, and calculations of what is politically efficacious."[211] They are bids for power and authority, and deserve to be taken seriously as such. Actions do not speak louder than words, because words are in themselves actions. Hence, driving a wedge between the material reality and the discourses through which that reality is perceived by the actors living in it is not fruitful.

Finally, Michael Adas made the case that the civilizing mission discourse was not merely a moral drape behind which the European imperial powers hoped to hide their naked

[210] Bederman, *Manliness and Civilization*, 24.
[211] Hoganson, *Fighting for American Manhood*, 14.

lust for power.[212] Instead the missions were the expressions of a sincere belief that the "civilized nations" of the world had a duty to go out and spread modern science to those peoples who supposedly lacked it.

The transformation of the material culture of these peoples was to be wrought by the West's cunning technological architect, the engineer: the tropical Daedalus. In the vignettes that follow we shall see first how he coped with setbacks, and where he could finds allies and adversaries within the civil administration of the two colonies. Subsequently the primary developmental strategies particular to the two colonies, and the role of the engineers in shaping and formulating them, will be analyzed. This is followed by an investigation into the engineers' claims to authority in social as well as well technical matters in the colony. Then the vision of the ideal colonial engineer – as dreamt up by the colonial engineers themselves – will be drawn into focus. Finally, the relationship between the American and Dutch engineers on the one hand, and the colonized Filipinos and Indonesians on the other will be reconstructed.

[212] Adas, *Machines as the measure of men*, 199.

## 3.1. Or Icarus? The failure of the Solo works in the Netherlands Indies

In 1895 Pieter Brooshooft's editorship of *De Locomotief*, the periodical published in Semarang that blossomed under his editorship between 1887 and 1895, came to an end when his contract was not renewed. In the years that followed Brooshooft acted as editor-in-chief of several publications in the Netherlands, but he was unable to equal the success he had enjoyed during his journalism career in the colony. This disappointing intermezzo lasted three years and ended when he managed to secure his return as editor-in-chief of *De Locomotief*, where he could once again devote himself to investigating the effects of the Dutch administration of the colony.

Brooshooft continued to demand that more efforts be made to promote the welfare of the indigenous population. In 1901 he authored a long pamphlet titled "*De ethische koers in de koloniale politiek*" ("the ethical course in the colonial policy") in which he reflected on the newfound calling of the Dutch in the Netherlands Indies. He was motivated to write his study because of what he deemed was a complete lack of interest towards the colony in the Dutch legislature, something Brooshooft had witnessed firsthand in the 1901 election campaign which took place during a medical furlough he spent in the Netherlands.[213]

The pamphlet did receive some coverage in the Dutch press, but was generally not treated in depth. This was decried by R.A. van Sandick, editor-in-chief of *De Indische Gids* (The Indies Guide), the prominent monthly dedicated to the economic, political and literary issues pertaining to the colony. In the section on colonial literature Van Sandick opined that were he to choose a book of the month, Brooshooft's long pamphlet would be deserving of this honorary title for months and months on end. He was also shocked to find that the public in the metropole did not share his opinion: "that it was not the book of the month for many people in our Netherlands, is a terrible charge against our people, which truly is not deserving of colonies, if it has so little interest in them, that even a book such as this does not attract an unusual amount of attention," he wrote.[214] Van Sandick found so much to like in his review of Brooshooft's study – which demanded large irrigation programs, the end of the corvée of indigenous laborers, greater emancipation and expansion of the indigenous political administration, expanded credit for farmers, and the improvement of medical care and

[213] E. Locher-Scholten, *Ethiek in fragmenten* (HES Publishers, 1981), 37-38, 44-45.
[214] R.A. van Sandick, "Naar aanleiding van Mr. P. Brooshooft's 'De ethische koers in the koloniale politiek,'" *De Indische Gids* 23 no. 2 (1901): 1126-1137, 1126.

education[215] – that only the impropriety of reprinting the piece in full, which he admitted would be plagiarism, led him to publish just excerpts from the piece.[216] He concluded his praise for the pamphlet by listing Brooshooft's proposals—of which the first three items on the list all pertained to irrigation and hydrological works.[217]

One of these listed items was the resumption of the irrigation works in the Solo valley, which had also received a mention in Van Deventer's article "*Een Eereschuld*."[218] This enormously ambitious project had been launched in the late 1880s and aimed at rerouting the river's estuary and constructing dams and irrigation canals that could provide water to a massive 150,000 hectare areal.[219] Cost overruns due to technical difficulties led to an escalating price tag for the project, and construction was put on hold in 1898 by the minister of colonies.[220]

A four-man commission was set up to determine the future of the Solo works. J.E. de Meyier, the director of the *Bureau Openbare Werken* between 1898 and 1901, was its only member residing in the colony itself and developed into a staunch opponent of the works. Although De Meyier agreed with the other three members of the commission that the project was technically feasible, he feared that the current design was at risk of eventual failure due to excessive depositing of silt, which he considered likely. He was also alone in his reservations about the expected *rentabiliteit* or profitability of the plan, which he argued was not in line with the enormous fifty million guilder investment required—a sum that was equal to the average annual net exports of the colony in the last five years of the nineteenth century, and hence an enormous strain on the colony's finances.[221] Ethical thinkers such as Van Deventer and Brooshooft, who argued from the position that the Dutch still had to reimburse their *ereschuld* to the Indonesians, were less daunted by such sums because the indemnity of the Netherlands to the colony could pay for the project many times over. They therefore continued to support it.[222]

Against the wishes of other prominent colonial engineers[223] who had already delivered significant irrigation projects (though never of the size of the uniquely ambitious Solo works),

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[215] Locher-Scholten, *Ethiek in fragmenten*, 45.
[216] Ibid., 1128-1129.
[217] Ibid., 1136.
[218] Ravesteijn, *De zegenrijke heeren der wateren*, 200.
[219] Ibid., 181.
[220] Ibid., 184.
[221] Burger, *Sociologisch-economische geschiedenis van Indonesia*, 89.
[222] Ravesteijn, *De zegenrijke heeren der wateren*, 200-201.
[223] These were the later directors of BOW P.J.Ott de Vries (1914-1920), and J.Homan van der Heijde (1911-1914); and the professors of Irrigation Engineering at Delft A.G. Lamminga (1910-1911) and W.Elenbaas (1911-1913). Ibid., 195-197.

and who would later serve as professors of irrigation studies at Delft or directors of BOW in the first two decades of the twentieth century, the Solo works were shut down indefinitely in 1903 by Idenburg, then minister of colonies and the later "ethical" Governor General of the Netherlands Indies.[224] This was a victory for De Meyier, whose opposition to the project was described in a later analysis as a "crusade."[225] This crusade was launched not just from his seat as director of BOW, but also from the pages of his publications. In a twist of fate he had been provided with a platform to disseminate his critiques by the Solo-supporter Van Sandick, who stepped down as editor-in-chief of the *Indische Gids* in 1902 and passed the torch on to De Meyier.[226] Van Sandick had been appointed the head of the editorial board of *De Ingenieur* two years earlier, which had been repurposed as the joint publication of the KIvI (to which Van Sandick belonged) and the VDI. In the inaugural issue of his editorship De Meyier unleashed a broadside on the plans for the Solo Works with an article titled "Irrigation-Fanaticism," in which he argued in favor of smaller irrigation works rather than those with the enormous scope of Solo.[227]

The discontinuation of the Solo works, which effectively meant its failure, was damaging to the authority of the irrigation engineers in the Netherlands Indies. In practice the administrators who identified with the Ethical Policy did not reason with the *ereschuld* as point of departure; the *rentabiliteit* was of greater importance. A committee, the *rentabiliteitscommissie*, in which aside from the engineers members of the BB also took seats, was instituted in 1897 to assess whether the economic benefits accrued from public works could justify the costs of initial investment.[228] Although some projects of questionable yield continued, the great ambition of the engineers was held in check by the BB, which clawed back some of its authority in the wake of the Solo failure.[229] Just how great the ambition of the engineers was in general can be gleaned from the fact that the majority of KIvI members attending a series of meetings in 1902 where the future of the project was discussed remained in favor of seeing the plan through to the end. De Meyier, who was present at one of these meetings, was well aware of the relative isolation his opposition put him in, and refrained from joining the Institute because of this.[230] The vast scale and ambition of the Solo irrigation plan, which would irrigate a surface area equivalent to two-thirds of the projects commenced

[224] Ravesteijn, *De zegenrijke heeren der wateren*, 193.
[225] Ibid., 203.
[226] R.A. van Sandick, "Een afscheidwoord," *Indische Gids* 24 no. 1 (1902): 1.
[227] J.E. de Meyier, "Irrigatie-Fanatisme," *Indische Gids* 24 no. 1 (1902): 172-195.
[228] Ravesteijn and Kop, *Bouwen in de Archipel*, 166.
[229] Ravesteijn, *De zegenrijke heeren der wateren*, 221.
[230] Ibid., 192.

in the previous half-century[231], kindled the enthusiasm of the engineers—and perhaps made them in equal measure fearful of the consequences that such a massive failure might entail.

Meyier's "crusade" showed to the outside world that there existed technical grounds that supported dismissing the Solo plans, giving him a key role in the political dynamic that led to its discontinuation. His argument that small works were superior to the kind of massive plans like Solo that foresaw in the rerouting of entire river estuaries was also grist on the mill on the rising class of agricultural experts in the colony – a Department of Agriculture would be set up by Idenburg in 1904 – who preferred small-scale projects in which outreach to the indigenous farmers and education played a significant role.[232] The engineers showed much less concern for the practices of the farmers; instead, they wanted to revamp the material environment of those who tilled the soil and provide them with an abundance of water, which they thought of as the crucial resource for bountiful harvests in the colony.

The black eye that the Solo works dealt to the BOW and its irrigation engineers was thus to an extent inflicted by its former head De Meyier. His strategy of fighting the project in the pages of the *Indische Gids* and through other publications shows that periodicals were as important as a tool for effecting change for the engineers as they were to Van Deventer. De Meyier even spread his message of the new focus of the Dutch on small-scale irrigation engineering on Java to an international audience when he delivered a lecture to the participants of the International Engineering Congress held in Saint Louis in 1904 by the ASCE.[233] The lesson learned from the Solo debacle was clear: irrigation engineers could not rely on their works to speak for themselves and prove their worth to an observer. The effectiveness of the technical artifacts needed to be propagandized in order to make their construction possible and prevent them from being shut down by competing interest groups in the colonial administration.

The failure at Solo threw a spanner in the works of the irrigation engineering community in the Netherlands Indies, which since the 1885 *waterstaatsreglement* had seen its authority and independence grow. Funding for this subdivision of the public works department, the largest within the BOW, remained stagnant for a decade.[234] *Rentabiliteit*, a concept that ironically had been drawn from engineering itself, came to frustrate their ambitions.

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[231] Ravesteijn and Kop, *Bouwen in de Archipel*, 164.
[232] Moon, *Technology and ethical idealism*, 28.
[233] J.E. De Meyier, "Irrigation in Java," in *Proceedings of International Engineering Congress held under the auspices of ASCE, St. Louis, Oct 3rd - 8th, 1904;*, ed. ASCE (New York: ASCE, 1905).
[234] Ravesteijn and Kop, *Bouwen in de Archipel*, 160.

A period of introspection began among the Dutch colonial engineers, who were shocked by the discontinuation of their most ambitious project and who felt the wheels were spinning under their plans to bring irrigation to all of Java. The irrigation engineer A.G. Lamminga, who would later be celebrated as one of the founding fathers of the new approach to irrigation in the archipelago, was one amongst many who would continue to lobby for the resumption of the works after 1903. Lamminga held sway within the irrigation engineering community as the designer of one of the archipelago's new "complete" irrigation works, the 30,000 hectare Pemali irrigation project constructed between 1893 and 1903. The project had entailed the construction of a main channel and the secondary and tertiary waterways which distributed the water, as well as the creation of a management system that decided how water would be distributed and works maintained.[235] The Pemali project set the example that was to be followed in later projects.[236]

The Solo issue was part of Lamminga's inaugural speech as professor of irrigation at Delft, a chair he took up in 1910. He contended that the economic rationale used by the *rentabiliteitscommissie* to shut down the project was flawed: whereas the committee judged the proposed construction of irrigation works on the basis of the expected increases in land rents that were to follow completion, Lamminga was of the opinion that the raw increase of crops should be the actual measure of *rentabiliteit*. He used the example of his Pemali works to illustrate the point: crop size had more than doubled after irrigation, but because land rents had not been raised – which had been the result of what he sarcastically called "a peculiar philanthropic notion" – the increase *rentabiliteit* appeared to be insignificant. From his point of view rents ought to keep pace with the technical improvements to reveal the actual improvements in crop yield that irrigation provided.[237]

Lamminga's critique, which came from one of BOW's old hands and was delivered almost a decade after the discontinuation of the Solo works, reveals just how painful and frustrating a blow the discontinuation of the project had been to the ambitions of the colonial engineers. J. Homan van der Heide made attempts to restart the plan when he became director of BOW in 1911, but once again ran into De Meyier's staunch opposition and ultimately decided to launch several smaller (but still relatively large, at approximately 40,000 hectares)

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[235] Ravesteijn, *De zegenrijke heeren der wateren*, 160-165.
[236] Ibid., 171.
[237] A.G. Lamminga, *Beschouwingen over den tegenwoordigen stand van het irrigatiewezen in Nederlansch-Indie: Rede, uitgesproken bij de aanvaarding van het tijdelijk ambt van buitengewoon Hoogleeraar in de Waterbouwkunde aan de Techn. Hoogeschool te Delft, den 12.4.1910* (Den Haag: Gebrs. J & H. van Langenhuysen, 1910), 24-27.

projects elsewhere in the archipelago.[238] What this episode shows is that the most ambitious of the Dutch technologists were not willing to adjust their outlook on how the material transformation Netherlands Indies ought to be performed. Even after the failure of Solo, their zeal was undiminished.

[238] Ravesteijn, *De zegenrijke heeren der wateren*, 230.

## 3.2. Defalcations and trust in the Philippines

A central tenet of the American program of benevolent assimilation was the democratic tutelage of the Filipinos. This planned political education entailed the introduction of suffrage, though only to the literate and propertied *ilustrado* classes at first, and the induction of Filipinos who passed civil service examinations into the American-led civil administration of the Philippine Islands. The local and municipal elections put them into the office of mayor and councilor only a few years after annexation, with their fellow countrymen serving as their staff. The intent of this early devolution of power to indigenous officials was to guide them in the practice of self-administration and provide them with the experience of governance. In that capacity they were still under the guardianship of the colonial authorities: American provincial treasurers kept a close eye on the finances of these local administrations and were tasked with reporting any aberrations in an effort to stamp out corruption.[239]

In early annual reports submitted by the Philippine Commission to the Secretary of War in Washington the authors made mention of the growing number of Filipinos passing the civil service examinations and taking up positions in the administration. They commended the new recruits for the speed at which they were mastering the English language – considered a prerequisite for positions in the government – and expressing the hope that their share of the total administrative personnel would continue to increase rapidly in the future. However, a "humiliating experience" had befallen the American side of the administration in 1903.[240] The government had specifically appointed Americans alone to "positions of pecuniary trust", such as the office of treasurer, but now found itself confronted with a series of "defalcations": the embezzlement of funds. The administrators of the colony immediately realized the grave blow this dealt to the image of the Americans, who had made the fight against corruption an important pillar of their campaign to civilize and uplift Philippine society. Prosecutions were launched, but were not always successful; in one case a treasurer succeeded in escaping to the United States where he was safe from punishment because no extradition treaty was in place to bring him to justice.[241]

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[239] Julian Go, "The chains of empire: state building and "political education" in Puerto Rico and the Philippines," in *The American colonial state in the Philippines: global perspectives*, ed. J. Go and A.L. Foster (Duke University Press, 2003), 182-183, 198.
[240] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1903*, vol. 3 (Government Printing Office, 1904), 64.
[241] Ibid.

The 1903 report suggested several causes for the defalcations. First, the transition from military rule to civil rule in the previous years had led to a quick turnover of personnel as military officials were relieved and civilians took their place. The speed of the transition and the immediate need for the replacement of personnel due to the indispensability of American "tutors" in the administration had made a thorough investigation into the backgrounds of the new recruits of the civil service impossible. Later investigations into the backgrounds of those individuals who were suspected of fraud revealed that some of them had entered the Philippine administration under false names to hide patterns of "dishonesty" in their past.[242]

The second perceived cause of the defalcations was the situation in the Philippines itself. As the authors found, "[in] the very unsettled conditions which have prevailed here, men who would not have yielded to temptation to dishonesty in the States were unable to resist it here."[243] They cited an excerpt from the first Philippine Commission Report which they considered relevant. It stated that the great distance between the archipelago and the home of the officials in the United States was thought to induce a greater ambition in them to quickly amass wealth to make the investment in such a long voyage pay off. It was suggested that paying officials good wages might help them fight off the temptation to resort to fraud.

But financial considerations alone did not drive their criminal behavior. The "Tropics" of the Philippines were hazardous to the Americans who came there, so that "liberal leaves of absence" were necessary to preserve their health. This dangerous "tropicality" was not just natural—it was also social: "The lack of ordinary, rational, and healthful amusements for one engaged as a provincial officer in the country itself turns the minds of not overstrong natures toward vicious pursuits and enjoyments like those of gambling and licentious association with native women."[244]

This passage reveals the gendered dangers of the Philippines to the exclusively male actors driving the civilizing mission. Aside from providing incentives such as better pay and generous furloughs to the men staffing the archipelago's administration to avoid them from falling prey to native women, the authors of the report stressed that a rigorous selection process was needed to weed out those applicants who suffered from weak minds: only those aspiring administrators who were in possession of a "good moral character" should be admitted to the government of the colony.[245]

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[242] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1903*, vol. 3, 65.
[243] Ibid.
[244] Ibid.
[245] Ibid.

Character, as the presidents of the ASCE would have it, was what the exemplary engineer possessed in spades. In his 1902 address at the annual convention of the ASCE, the Society's president Robert Moore stated that character was necessary "for real success in any calling, be it that of the professional man or the man in political or commercial life." It could not be learned from books or taught in classes, but was "partly the result of inherited qualities and partly the result of daily contact with men and things." As if to make sure that the masculine idealism of character was not lost on his audience, he followed this up with the observation that to make character development work, "we must, first of all, have a strong and worthy man." But even in this raw form, the "manly qualities" had to be developed, and it was in that regard that the daily practice of engineering made the profession stand out from all others in its advancement of the masculine individual, because engineers supposedly had a greater dedication to truth than any other profession. Moore explained that whereas the history of medicine was replete with quacks and snake oil, and even law and theology had cherished falsehoods that had gone undetected for millennia, engineers had to abide by the truth because any structure erected or machine assembled on the basis of false theories was destined to fail.[246] In short, America's engineers, more than any other profession in the country, fashioned themselves as deserving of the public's trust—and this claim to authority was supplemented with the argument that they embodied the masculine ideals to boot. We have already seen that this fashioning process was to an extent successful in the Philippines: on each provincial board an engineer acted as supervisor.[247]

These gendered ideas on the nature of the profession voiced by Moore became intertwined with ideas of class and racial superiority in the colonial space, where engineers – like many other officials who enjoyed an elevated status – expressed distaste for those Americans who entered into the kind of "licentious associations" with indigenous women that the Philippine Commission Report had warned of. Using frontier-terminology, they and others derisively called these Americans, who were often former soldiers, "squaw men." Colonial engineers' academic qualifications and relatively high wages put them a cut above most of the other Americans in the colony, so that class issues further elevated their sense of superiority.[248]

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[246] Robert Moore, "Address at the annual convention at Washington, D.C., May 20th, 1902: The engineer of the twentieth century," *Transactions American Society of Civil Engineers 48, 1902* (New York: 1902): 227-234, 230-232.
[247] Adas, *Dominance by design*, 145.
[248] J.J. Halsema, *E.J. Halsema, colonial engineer: a biography* (Quezon City: New Day Publishers, 1991), 41.

But several high-profile failures of public works in the Philippines damaged the image that Moore had projected of the engineers' scientific power and mastery over nature. By extension these failures hurt the authority of American colonial rule in general, as the history of the Baguio road shows. The city of Baguio, located some 250 kilometers north of Manila in a cooler mountain climate, was selected by the Philippine Commission to function as a summer capital where the heat-averse American officials could recuperate from the strenuous tropical climate.[249] They followed the examples of the European empires in Asia with this decision; the Dutch had selected Buitenzorg (and later Bandoeng) on Java, near the capital of Batavia. The construction of a road leading to Baguio was a financial disaster, costing upward of two and a half million dollars, and aroused the ire of Filipino nationalists who saw the archipelago's coffers being drained to suit the needs of the Americans.[250]

But cost overruns were hardly the worst of the problems faced by colonial engineers. The first irrigation project launched by BPW, the San Miguel project of 1909 in Tarlac province, failed in July of 1911 when a dam burst due to flooding following a typhoon.[251] The investigation into the cause of the burst concluded that the design contained several grave errors, with the dam being improperly located and inadequate for its task. Personnel changes were made and the irrigation division was reorganized in hopes of preventing such mistakes from recurring in the future.[252] The next year another dam failed its task, this time belonging to Cebu City's Osmeña waterworks. It had been named after Sergio Osmeña, a young Filipino nationalist who had made an impression on the American administrators, and who was appointed governor of Cebu province between 1901 and 1907.[253] A cholera epidemic that struck Cebu City in 1909 took the lives of hundreds of its inhabitants, and Governor-General Cameron Forbes who had been appointed in that same year was pressured by the local population to provide a clean source of drinking water. To create a water reservoir, a dam was designed by the young engineer E.J. Halsema, a native of Ohio who had made his way into BPW's service in 1908. The works were opened with great fanfare on February 17th of 1912: the day was designated as a public holiday in the province and Forbes was present to celebrate the momentous occasion, which was hailed in the press.[254] But just eight months later the record-breaking rainfall from a typhoon washed away the embankments around the dam.

[249] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1903*, vol. 2 (Government Printing Office, 1903), 892.
[250] Halsema, *E. J. Halsema, colonial engineer*, 23.
[251] W.L. Gorton, "San Miguel Irrigation Project," *Bureau of Public Works Quarterly Bulletin* 2, no. 2 (July 1st 1913): 36-40, 37.
[252] Greene, "Annual Report of the Director of Public Works, 1911," 35.
[253] Halsema, *E. J. Halsema, colonial engineer*, 32.
[254] Ibid., 79.

Working from limited funds, and based on previous meteorological data, it had been deemed unnecessary to reinforce the surroundings of the structure.[255]

These disappointing events cast doubt upon the notion that the engineers' "esoteric knowledge" of science kept them from making mistakes. The geographical challenges particular to the Philippine islands, the young engineer corps' inexperience with building dams, and general unfamiliarity with the unpredictable weather patterns of the archipelago all worked to challenge the image of the engineers as a professional class immune to mistakes. In the lead-in editorial to the *Quarterly Bulletin* distributed in January of 1914, Clarence Hubbell, at the time Chief Engineer of BPW, made attempts to salvage the reputation of the engineers by pushing back against the idea that his personnel was infallible. Under the title "Who pays the bill?", Hubbell opined that neither individual engineers nor BPW could be held financially responsible for those cases in which structures such as buildings, dams, and bridges collapsed. Going against the ideas articulated by ASCE president Moore in the past, Hubbell argued that "[t]here is a curious misconception that engineering is an exact science and therefore an engineer should make no mistake. Nothing could be further from the truth." Engineers used formulas to obtain approximations, not exact figures; hence, "[a]n engineer pits his training, experience, and skill against the unknown in nature." Furthermore, building indestructible buildings would be prohibitively expensive; building more economical buildings that were not over-engineered was in the interests of greater "efficiency", Hubbell contended.[256]

Hubbell's writings can be understood as an attempt to reorient the image of the engineers as experts not of the exact, but of the experimental. Experimentation had the positive connotations of being related to innovation and progress, while simultaneously allowing for the fact that experiments might fail to return the results hoped for. As such, the "experiment" formed a defensive discursive bulwark against critics of engineering practices, and was a rhetorical gesture used by many engineers to protect their image as trustworthy experts even when their works did not live up to the expectations of the public.[257]

Contrary to the experiences of the Dutch irrigation engineers in the Netherlands Indies, where the BB felt that its traditional primacy was being assailed by the rising class of BOW engineers and their *Waterstaat*, and where even the ethically minded Minister of Colonies

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[255] "Repairs to storage Works, Osmeña water supply system, Cebu, Cebu, P.I." *Bureau of Public Works Quarterly Bulletin* 2, no. 3 (October 1st 1913): 16-18, 16.
[256] Clarence Hubbell, "Who pays the bill?," *Bureau of Public Works Quarterly Bulletin* 2, no. 4 (January 1st 1914): 2-3.
[257] Marsden and Smith, *Engineering Empires*, 10.

could not muster support for continuation of the Solo works, the American engineers had less to fear of Philippine Commission bureaucracy in terms of curtailment of their ambitions. This was in part because the interests of the highest levels of civil administration of the Philippines and the engineers' ambitions ran in parallel. It had been the Philippine Commission itself that had made the material transformation of the recently annexed islands one of its highest priorities. Engineers received great support from Taft's Commission during his tenure as Governor-General (1901-1904). Their work even increased in importance under his successors James Smith (1906-1909) and William Cameron Forbes (1909-1913).[258]

Forbes was particularly dedicated to vigorously developing the archipelago's infrastructure, likely due to the fact that prior to obtaining the seat of Governor-General he had served as the Commissioner of Commerce and Police. In that role he was tasked with the oversight of the BPW, which sent him detailed annual reports of its latest achievements. His familiarity and affinity with the Bureau's plans meant that even the failure of the Osmeña works – where he, to the public, had been a visible participant in the process that led to its construction – was perceived as a momentary setback, rather than a moment to tighten the reins on the engineers.

However, at other levels in the civil administration the authority of the engineers was contested. In 1913 the Philippine Assembly debated the merits of an act which would allow provincial boards to break contracts, discharge district engineers at the end of their contracts, reduce salaries, and, more threateningly, hold them personally liable for failures. The district engineers expressed their opposition to these plans at their conference held in Manila in February 1913, fearing that they would have to obey the orders of their "two 'masters'" on the three-man provincial boards if the act would pass.[259] Even though the act was not instituted, Hubbell's article "Who pays the bill?" in the following year was clearly a pushback against the sentiments that had driven it, so that even in the Philippines the engineers' authority was not uncontested.

[258] Adas, *Dominance by design*, 148.
[259] "Proceedings of the district engineers' conference held at Manila, P.I., February 4-11 1913," *Bureau of Public Works Quarterly Bulletin* 2, no. 1 (April 1st 1914): 10-18, 16.

## 3.3. Developmental strategies compared

When the Second Philippine Commission, headed by Taft from 1901 to 1903, began its task of governing the islands it found the public infrastructure to be in a deplorable state. Aside from such issues as the underdeveloped port facilities in Manila – where, lacking a protected anchorage, ships could find no shelter from the seasonal storms – it found the roads to be in a particularly decrepit condition. Because the archipelago's climate lashed the roads with heavy rains, continual maintenance was of great importance to keep them in a usable state. However, due to the guerilla war, this had not been possible in previous years, and the transport network, already weak in Spanish times, had degraded considerably. It was obvious that the absence of a working logistical network would frustrate the Commission's plans for developing the economy of the colony: without decent transportation, the Commission's push for lower tariffs on products from the Philippines entering the United States (to raise demand), and the encouragement of investment in the islands (to increase production) would come to naught if products could not be moved out of the colony. Aside from improving Manila harbor, a great deal of attention was thus devoted to developing the overland transport capacity of the islands.[260] James Wallace Beardsley, the consulting engineer for the Commission, stated in 1901 that to him "[t]he general subject of improved transportation occupies a primary position."[261]

Roads had more than just economic value for Beardsley and the Commission. They were also considered an indicator of the level of civilization, as expressed in the Commission's 1900 report: "It may be asserted as a truism that people without roads are necessarily savage, because society is impossible; and just to the extent that roads are lacking or defective, real progress is retarded and prosperity hindered."[262] By constructing roads, the Americans believed they were providing the Filipinos with this prerequisite for civilization and uplifting them from their state of savagery.

In this chapter the developmental strategies used by the Americans in the Philippines and by the Dutch in the Netherlands Indies will be examined in closer detail. By focusing on the meanings invested in the technologies that the engineers brought to island chains to

[260] May, *Social engineering in the Philippines*, 138-139.
[261] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1902*, vol. 1 (Government Printing Office, 1903), 255.
[262] Quote appears in May, *Social engineering in the Philippines*, 139.

transform the material environment of the two colonies, their specific visions for the development of the archipelagoes will be drawn into focus.

In the Philippines the progress of road policy was slow during the first years due to the limited funding the administration had at its disposal. Forbes, who became secretary of commerce and police in 1904 and as such counted infrastructure development amongst the responsibilities in his portfolio, hoped to speed up construction with a bill he drafted that demanded that able-bodied men provide five days of labor annually for road construction. However, implementation was delayed and resisted at the provincial level due to this compulsory aspect because it was reminiscent of Spanish coercive practices. In 1906, the recently installed Governor-General Smith provided an alternative legislative framework with several bills of his own. These prescribed that provincial boards that agreed to double the cedula tax (a poll tax) for road construction would receive additional funding from the central colonial government. This incentive led to the rapid adoption of the higher taxes, and all provinces had implemented the bill by 1909. That year Forbes leveraged his close relations with Taft, who had succeeded in winning the presidency after Roosevelt had finished his second (though first full) term, to take over as Governor-General from Smith.[263] During the four years of Forbes' tenure the mileage of first-class roads more than quadrupled and second-class roads almost doubled.[264]

Forbes explained his motivations for attaching such importance to the issue of road-construction in a 1908 circular to officials involved with road policy on the Philippine Islands. He introduced his ideas by stating that "[n]o matter how rich, fertile, and productive land may be, the owners and inhabitants of it can only realize a fraction of its value if there is no market for its products. They are thrown back into the primitive state of living where each person instead of producing the things which he can produce most economically and selling them, and with the money buying things he which others can produce economically, will produce for himself a poor class of [goods]… The construction of a road immediately puts the vigor of life into the agriculture and industry of the region which it opens." Roads, he contended, were the measurement by which it was possible to ascertain the "merit of a government and the degree of its administration." And while Napoleon "is considered one of the greatest

[263] Halsema, *E. J. Halsema, colonial engineer*, 31.
[264] By 1913 some 1,303 miles of first-class roads and 1,264 miles of second-class roads had been constructed, along with 1,913 miles of third-class roads. May, *Social engineering in the Philippines*, 144-146.

administrative officers that ever lived" according to Forbes, in his eyes the most tangible remaining artifacts of the French conqueror's administration were his roads.[265]

In other words, roads performed three roles according to Forbes. First, improved transportation expanded the scope of the economy and allowed for more exchange. These market forces would allow for greater specialization by laborers, transforming them from self-sustaining workers into more efficient market-oriented producers and consumers. This element of the plan for economically developing the islands through increased exchange was supplemented with the construction of reinforced concrete market buildings throughout the archipelago's municipalities. By 1908 a special market construction program was launched by the BPW that built these marketplaces using standardized designs.[266]

Second, well-kept roads projected a sense of development, and acted as a source of legitimacy for a government. This played into the third final element of Forbes' vision: once roads were established and had proven their value to the populace, they acted as permanent improvements. As with the switch to reinforced concrete for the market buildings, Americans constructed roads using techniques that were in use throughout the West: following the design recommendations of the ASCE, tar macadam roads were laid out throughout the Philippine Islands, while at other times this technique was combined with the concrete highway foundations in use with the New York State Highway Commission.[267] Though he did not use as many words, Forbes clearly was under the impression that the roads the engineers were constructing would be permanent monuments to the improvement wrought by the Philippine Commission's administration.

The engineers of the Bureau of Public Works shared Forbes' enthusiasm for road work. We have already seen that Beardsley, prior to serving as the first director of the BPW from 1905 until 1908, thought that improving transportation was of great importance. After his departure from the post, the personnel of the Bureau continued to expend great sums on road works: during the 1911 fiscal year almost half of their total budget of close to ten million pesos was dedicated to road improvement, with building work coming in second at approximately thirty per cent of the budget.[268]

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[265] W. Cameron Forbes, "Letter of the Secretary of Commerce and Police to all provincial, municipal, and other officials relative to the present road policy in the Philippine Islands," Manila, June 16th 1908; Public Works; General, 7152; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[266] "Market construction program," *Bureau of Public Works Quarterly Bulletin* 2, no. 3 (October 1st 1913): 9-15.

[267] C.E. Gordon, "An experiment in macadam asphalt construction," " *Bureau of Public Works Quarterly Bulletin* 1, no. 4 (January 1st 1913): 19-21, and H.V. Miles, "Concrete Highways," " *Bureau of Public Works Quarterly Bulletin* 1, no. 4 (January 1st 1913): 21-24.

[268] Insert contained between pages 12 and 13 in Greene, "Annual Report of the Director of Public Works, 1911."

In addition, the engineers also infused their work with the supposed civilizing power of roads. The pages of the *Quarterly Bulletin* were filled with articles on road work, and even though the majority of these submissions were of a technical kind – detailing the costs incurred during construction, or the method of labor management used – many were also of a more general nature, revealing the engineer's belief in the transformative power of their work. Particularly noteworthy in that regard are the poems that litter the *Bulletin*'s pages, which were often reproduced from magazines printed in the United States. In one stanza from a poem lifted from *Highway Magazine,* the author distanced himself from the "hermit souls that live withdrawn" and instead implored:

"Let me live in a house by the side of the road,
Where the race of men go by,
The men who are good, and the men who are bad,
As good and bad as I.
I would not sit in the scorner's seat,
Or hurl the cynic's ban—
Let me live by the side of the road,
And be a friend to man."[269]

The poems always included mention of roads, and were almost without exception equally endearingly clumsy. Each described the world from the engineer's perspective, and described the role their works and profession had on the society that lived in the environment they created.

Other submissions took the form of lengthy travelogues interwoven with tables detailing such items as the increasing road mileage in the archipelago, or new plans for extending the transport network into still to be unlocked hinterlands. Like most of the articles in the *Quarterly Bulletin*'s glossy pages, these reports were designed to be visually stimulating; the BPW provided its personnel with cameras, allowing many photographs to be inserted into the narratives.[270] For example, Burckhardt von Schmeling wrote a tourist account of his voyage on the roads of Southern Luzon. Von Schmeling, a German national, was at the time employed by the Bureau as one of its four division engineers, and in that capacity was the supervisor of the district engineers of seven provinces. Next to the rather dry tabulations on agricultural production in the areas he visited, the editors of the *Bulletin* placed pictures of the various vistas Von Schmeling enjoyed during his travels, such as the symmetrical cone of the volcano Mount Mayon. The article then segued into a swashbuckling

[269] "The house by the side of the road," *Bureau of Public Works Quarterly Bulletin* 2, no. 1 (April 1st 1913): 52.
[270] Halsema, *E. J. Halsema, colonial engineer,* 46.

account of a group of American mountaineers who had scaled its peak. Included in the aside were photographs of the landscapes they encountered and the hardship they endured along the way: in one shot a member of the expedition could be seen squeezing the moisture from moss growing on the rocks for nourishment.[271] Such an article full of adventure must have appealed to the engineers reading the bulletin: they would likely have grown accustomed to seeing the members of their profession depicted as conquerors of space and as cowboy-like frontiersmen, as they were in a growing body of American literary works from the 1890s onwards.[272]

Von Schmeling also used his travelogue to make several claims about the political environment in which public works were built. He opined in several of its opening paragraphs that "[i]n all countries of the world where this class of public work [road work] is carried on, with funds secured by a personal tax collection, an element of favoritism, for political interests, influences detrimentally the progress of the undertaking… Satisfactory results will be obtained only when broadminded officials put aside their whims or speculations, adopt a definite policy and program, and carry it out systematically, overcoming all obstacles." Von Schmeling contended that the self-interest of the taxpayers often stood at odds with the government's role of acting as the "father of a large community with mutual interests." He found that in the Philippines, however, the government had succeeded in establishing a policy that overcame these obstacles—a policy that was to a large extent crafted and implemented by the BPW's personnel. Together with railroads, the roads would serve as the "arteries, giving life to the entire body" of Philippine society.[273]

As the years went by the traffic arteries fed a larger and larger area of the Philippines. Hoping to provide further incentives for both the civil engineers involved in road works and the provincial governments that funded their activities, the secretary of commerce and police began awarding cash prizes from 1910 onwards to provinces that had succeeded most in maintaining or extending their road networks. The director of the BPW served as the chief of the committee of Filipino Assembly members that doled out the awards.[274] So impressive were the labors dedicated to maintaining roads in the archipelago that in 1917 the engineer

[271] B. von Schmeling, "Road system in Southern Luzon," *Bureau of Public Works Quarterly Bulletin* 2, no. 2 (July 1st 1913): 46-61.
[272] Elizabeth Ammons, "The Engineer as Cultural Hero and Willa Cather's First Novel, Alexander's Bridge," *American Quarterly* 38, no. 5 (Winter, 1986): 746-760 754.
[273] Von Schmeling, "Road system in Southern Luzon," 46-47.
[274] Warwick Greene, "Road prizes,"*Bureau of Public Works Quarterly Bulletin* 3, no. 3 (October 1st 1914): 2-3.

E.D. Smith, working in the Ilocos Sur province, became the recipient of a Michelin gold medal. The prize would proudly be figured on the cover of the *Quarterly Bulletin*.[275]

Railroad construction, the "main artery" in Von Schmeling's vision for the Philippines, lagged well behind the extension of the road network in the archipelago. Legislation passed in 1905 that gave the Philippine government a role in efforts to build more railways, and in the following year concessions were granted to two syndicates from the United States. Under the agreement the Philippine Railway Company and Manila Railroad Company were expected to expand the small network in the Philippines that had existed since Spanish times to a combined total of 1,183 miles.[276] By 1912 the Manila Rail Company had succeeded in realizing less than two-thirds of the mileage agreed upon, and the work of the Philippine Railway Company had stalled entirely that year; the latter even attempted to have its concession revised to get out from under some of the projects it had agreed to build.[277] Roads thus remained the most visible public works improvements in the Philippines.

This stood in sharp contrast to the veritable railway boom that held the Netherlands Indies in its grip at the time. The railways in the colony were initially off to a slow start: in the late 1870s the network on Java was less than 200 miles in total, while Britain's India was by then already furnished with over 8,000 miles.[278] In the years that followed the pace of construction picked up, and an 1899 map of Java shows that by then the network had grown fourfold compared to two decades earlier.[279] The colonial government had an important hand in achieving this feat: a lack of private interest in the concessions granted on the island made government involvement necessary.[280] With the rapid expansion of the colony's exports after the turn of the century, more investment originating from private sources became available, but the Staatsspoorwegen (State Railways) would remain the largest railway company on the islands by far, exploiting over 1,600 miles of railroads on Java alone by 1925.[281] The board governing the Staatsspoorwegen, and those of the private railways too, consisted exclusively of engineers. Representing an entirely new technology, they were free from the meddlesome interference of the BB, which lacked the knowledge to duly influence their affairs. The railway companies also made attempts to dissociate themselves from the BOW, although

[275] *Bureau of Public Works Quarterly Bulletin* 8, no. 1 (April 1st 1919).
[276] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1906*, vol. 1, 10, 51-54.
[277] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1912*, 23-24.
[278] Van Doorn, *De laatste eeuw van Indië*, 126.
[279] Ravesteijn and Kop, *Bouwen in de Archipel*, 70-71.
[280] Ibid., 66.
[281] Ibid., 77.

these failed in a formal sense as they were absorbed into the bureaucracy—but in practice, they operated highly autonomously vis-à-vis other institutional structures, which led Van Doorn to label them the first bloc of technocratic power to be established in the colony.[282]

Despite the importance of the railways in furnishing the increasing exports and expanding the colonial economy of the Netherlands Indies, many did not consider the growing railroad network to be an example of "ethical" policy. In the Dutch chamber of representatives the Indies Specialists Van Kol and Van Deventer registered their concern that the expensive railways were sapping precious funding from irrigation projects.[283] Although sharply diverging figures for the annual expenditure on the two technical fields exist in the literature,[284] there can be no doubt that railway construction was an especially capital intensive industry. The locomotives were bought from manufacturers in Britain, Germany and the United States due to the lack of an equivalent industry in the Netherlands.[285] The absence of steel mills in the colony also necessitated the importation of the steel required for the rails and bridges that carried the heavy trains, with the shipping of these items to the colony further adding to the cost.[286]

Aside from the cost aspect, Van Kol was also convinced that the railways served the business interests in the Netherlands Indies instead of the welfare of the local population. It was certainly true that the railways on Sumatra, where the growth of plantation exploitation and the railway network was particularly vigorous in the early twentieth century, were built primarily to support the interests of the plantation owners. Van Kol denounced these motives in the strongest terms in a 1900 speech on the budget, when he asserted that railway building ran in parallel with the capitalist exploitation of the colony.[287] However, not all railways were

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[282] Van Doorn, *De laatste eeuw van Indië*, 137.
[283] Ibid., 147.
[284] In *Bouwen in de Archipel*, the work edited by Ravesteijn and Kop, four separate sources offer sharply diverging and irreconcilable figures for government expenditure on irrigation and railway work. A table reproduced on page 45 from W.M.F. Mansvelt and P. Creutzberg ed., *Changing economy in Indonesia: a selection of statistical source material from the early 19th century up to 1940, 3* (The Hague, 1977) lists annual expenditure on irrigation works as amounting to around one million guilders between 1900 and 1905, and declining to the low hundred thousands for the period ending in 1920, when suddenly almost five million guilders were supposedly expended. Throughout most of the 1900-1920 era the figures for government expenditure on railways are often more than an order of magnitude larger. However, a graph lifted from W.A. van der Meulen, "Irrigation in the Netherlands Indies," *Bulletin of the Colonial Institute in Amsterdam* (1940), portrays the expenditure on irrigation as stable at a level of two million guilders between 1901 and 1909, with a sharp but steadily increasing curve thereafter, with expenditure peaking at eleven million guilders in 1921. This corresponds with the growing staff of BOW in the second decade of the twentieth century, and is therefore likely to be the more accurate representation of annual spending on irrigation works. Ravesteijn and Kop, *Bouwen in de Archipel*, 44-45, 160, 297.
[285] Ibid., 78-83.
[286] Ibid., 95.
[287] Van Doorn, *De laatste eeuw van Indië*, 147-148.

beholden to the interests of the European class in the Netherlands Indies. A 1904 government investigation into the use of passenger trains in the colony revealed that the number of Indonesian passengers was increasing explosively.[288] Nor was Van Kol himself immune to the charm of railway travel in the archipelago. In 1903, during an extensive tour of the island chain, he marveled at the fact that he could travel safely by train through Aceh, which had only shortly before been the theatre of colonial warfare, leading him to be labeled "truly a pure-idea model colonial passenger" by the historian Rudolf Mrázek.[289]

The prominent colonial irrigation engineer J. Homan van der Heide – head of BOW's Irrigation Brigade and later also director of the BOW from 1911 until 1914 – was not dazzled by the railways. He sharply agitated against the idea that railways and other transportation had as direct an impact on the welfare of the indigenous population as irrigation works. Far from being the life-giving arteries to the social body that railroads were in the eyes of Von Schmeling a little over a decade later, Homan van der Heide described railway-heavy Java in a long 1899 pamphlet in which he expressed his support for the resumption of the Solo works as a "colossus with a large, shiny head, and an even larger, empty stomach, and weak arms and legs."[290] He used the somatic metaphor to argue that from his perspective a lack of nourishment rather than impaired mobility was what ailed the colonial body.

In the following years irrigation became a plank of the ethical policy whereas transportation development did not, a point the irrigation engineers continued to hammer home. At the general conference of the KIvI engineers working in the Netherlands Indies, held on December 21st of 1904 in Batavia, the member Ligtvoet gave a presentation on a report he authored concerning the feasibility of railway construction on southern Sumatra. He ended by noting that improving the transportation network would lead to greater prosperity on the island, which elicited a reaction from the engineer Meijers seated in the audience. Meijers made reference to Homan van der Heide's comparison in the years before of the *nut* (utility) of railways on the one hand and irrigation on the other, which he thought was a commendable effort, though he was wary of the rivalry these comparisons might breed. Nevertheless, he made a point of asserting that railroads had little to do with the "ethical duty" of the Dutch. The Sumatra railroad was more likely to be about private enrichment, a goal he certainly did not oppose, but this should not be confused with the uplift of the colony's indigenous population.

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[288] R. Mrázek, *Engineers of happy land: technology and nationalism in a colony* (Princeton University Press, 2002), 11.
[289] Ibid., 11-13.
[290] Quote appears in Van Doorn, *De laatste eeuw van Indië*, 146.

Meijers then went on to propose four motions to be debated at the next gathering, with one of them stating that Ligtvoet's railway on Sumatra could not be said to fulfill the ethical duty of the Dutch toward the Indonesians. His proposal was accepted, but at the gathering in the following month the members consented almost unanimously not to bring these motions up to a vote. Although this was decided under the guise of the fact that the motions pertained to social rather than technical issues – to which Meijers and another member objected, stating that social issues were certainly relevant to their professional practice – it is not at all unlikely that those present did not wish to see their society split by the rivalry of the two competing lobbies.[291]

The claim of the irrigation engineers that their works were more in line with the needs of the indigenous population was underpinned by pointing to the long history of the practice on Java. In a speech held at the Colonial Agricultural Exposition held in the Netherlands in 1912, the editor of *De Ingenieur* Van Sandick – himself an ex-employee of the *waterstaat* in the Netherlands Indies – told his audience that it had not been the Dutch who made the Javanese turn to irrigation; the latter had made that commitment themselves when they began growing rice in paddies. What the Dutch engineers were doing was improving the indigenous practices: the Javanese lacked the technical capabilities to build systems that could withstand the onslaught of nature, which often took the form of the dreaded *bandjir*, making the technical acumen of the Dutch engineers necessary to create works of a permanent nature.

Van Sandick claimed in his speech that the BB deserved the blame for the engineers' lack of success throughout most of the nineteenth century. During that time the administrators of the BB were unwilling to provide the funding required to build integrated systems, so that chaotic and disjointed headworks were thrown up throughout the agricultural regions. In addition, the engineer was often sent off once the main works were completed, leaving the local population to fend with the problem of building the secondary works and administering the water flows.[292]

In fact, engineers often simply proved as unable as the Javanese to build structures that could weather the force of the *bandjirs*. In the Sampean delta, where the most disastrous attempt at "permanent" improvement took place, a dam built in 1852 gave way after five years and had to be repaired annually. The enormous amounts of manpower expended in the

[291] "Notulen," *Tijdschrift van het Koninklijk Instituut van Ingenieurs, Afdeeling Nederlandsch-Indië. Notulen der vergaderingen en verhandelingen, Instituutsjaar 1904-1905* (Batavia: Javaanse Boekhandel en Drukkerij, 1905): 1-5.

[292] R.A. van Sandick, "Irrigatie op Java. Voordracht gehouden op de Koloniale Landbouwtentoonstelling te Deventer op 19 juli 1912," *De Ingenieur* 27, *no.* 40 (1912): 914-922.

process, in combination with the failure of the irrigation works to increase the harvest, actually ended up impoverishing the local population. It would take until 1900 for a permanent solution to be built.[293]

But to Van Sandick, the stinginess and technical ignorance of the BB was the root cause of this disappointing period in colonial irrigation engineering. In his speech he welcomed the changes of the *waterstaatsreglement* of 1885 which gave engineers the resources to make detailed technical studies and use Western construction techniques that the BB had deemed too expensive. The fact that the irrigation engineers also gained control over the management and maintenance of the works after completing them, through the *irrigatie-afdelingen* (irrigation departments) set up in the years after the *waterstaatsreglement* was adopted, was also a positive development according to Van Sandick.[294] These new institutional arrangements indeed led to the very real shift of authority from the BB to the technical experts of the BOW.[295]

The practices of the Dutch irrigation engineers in the Netherlands Indies had also improved considerably in those years. After the *waterstaatsreglement* came in force the BOW began to perform in-depth technical studies of the regions they were tasked with improving. These preparations were followed with detailed plans that went beyond the construction of the primary headworks, and came to include the secondary and tertiary canals and the sluices that controlled water flow. An integrated, "systematic" approach emerged.[296]

The irrigation engineers did not behave as an insular community when they developed these new methods. They instead continually compared the practices in use in other irrigated zones across the globe with their own. British work in Egypt, and particularly India, appeared often in these treatises, but the Dutch did not restrict their views merely to the colonized parts of the world. Van Sandick introduced the American irrigation engineering space to his audience with a presentation at the conference of the KIvI in 1906, with the text being reprinted in *De Ingenieur*. He drew from his experiences traveling to the Engineering Congress held in Saint Louis in 1904, where De Meyier had contributed to the panel on irrigation. Van Sandick's presentation on the legal arrangements pertaining to irrigation in the United States was emphatically organized around the idea that lessons might be drawn from

[293] Ravesteijn and Kop, *Bouwen in de Archipel*, 161-162.
[294] Ibid.
[295] Ibid., 167-170.
[296] Ravesteijn, *De zegenrijke heeren der wateren*, 151-160.

the American practices for the benefit of the Netherlands Indies.[297] The account would inspire the later director of the BOW P.J. Ott de Vries to use his 1907 furlough to travel to the United States to witness these methods firsthand. He published a long report of the insights he had gained in the periodical of the KIvI members of the Netherlands Indies, headlining it with Roosevelt's remark to Congress that "[n]othing could be more unwise than for isolated communities to continue learning everything experimentally, instead of profiting by what is known elsewhere."[298] It is one of the many examples that show that, in terms of the techniques they were applying, the Dutch irrigation engineers in the Netherlands Indies – and, going by *De Ingenieur*, the engineers of other fields in the profession in general – were not beholden to a parochial perspective.

Nevertheless, the Dutch remained wedded to the idea that improvements in agriculture would uplift the peoples of the Netherlands Indies best, whereas the Americans in the Philippines sought to transform their colony through the construction of roads. The causes for these different strategies can in part be ascribed to the very different population densities of the colonies. Because many considered Java to be nearing overpopulation, emigration of Indonesians to the outer islands became one of the elements of the Ethical Policy, with irrigation serving to improve the fortunes of those who stayed behind. The Philippines, with its much smaller population and lower population density, faced no such problems.

Remarkably, the supporters of these differing visions in either colony often took to grounding their visions in historical precedent to further strengthen their arguments for the policies they wished to pursue, with Forbes pointing to Napoleon's legacy in Europe and Van Sandick to the Javanese indigenous practices. Some engineers of the BPW and the BOW looked even further into the past, finding continuity in their present efforts with those

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[297] R.A. van Sandick, "Waterrechten en irrigatiewetgeving in Canada en de Vereenigde Staten van Noord-Amerika en lessen daaruit te trekken voor Nederlandsch-Indië. Voordracht gehouden in de Vergadering van het Kon. Instituut van Ingenieurs van 23 October 1906," *De Ingenieur* 21, no. 43 (1906): 812-816. It drew avorable comments from the audience, "Waterrechten en irrigatiewetgeving in Canada en de Vereenigde Staten van Noord-Amerika en lessen daaruit te trekken voor Nederlandsch-Indië. Beraadslaging over de voordracht van het lid R.A. van Sandick, gehouden in de Vergadering van het Kon. Instituut van Ingenieurs van 23 October 1906," *De Ingenieur* 21, no. 44 (1906): 821-822.

[298] P.J. Ott de Vries, "Het irrigatiewezen in het Westen der Vereenidge Staten van Noord-Amerika," *Tijdschrift van het Koninklijk Instituut van Ingenieurs, afdeeling Nederlandsch-Indië 1909-1910* (Batavia: Javaanse Boekhandel en Drukkerij, 1910), 1.

practiced by ancient civilizations.[299] The government of the Netherlands-Indies even resorted to sending engineers to Italy to study the tradition of irrigation there.[300]

Another aspect of this focus on history was the hope of the engineers in either colony to bring "permanent improvement" to the material cultures of the indigenous peoples they worked to uplift. This permanence was in turn a legitimating force for colonial rule—but like the Roman aqueducts and the Napoleonic roads, they might continue to serve the populace long after the empires that built them had disappeared. In that regard the words spoken by Ott de Vries at the celebrations in honor of the 75th anniversary of the KIvI were prescient: "should our nation unexpectedly be destined to one day leave the Indies for good, then the Dutch people can thank their engineers for the fact that the Indonesians must say: yes, the Dutch may have left, but they have left their monuments behind."[301] Some engineers therefore believed they were creating something more than practical works—they were building monuments to their own ingenuity.

These different technological preferences of the Dutch and American engineers, and the different material outcomes their works were expected to produce, were also intended to produce different social outcomes. On the economic front, the American administration of the Philippines and its engineers hoped to transform the archipelago into an integrated market that could more efficiently allocate its (agricultural) products amongst the populace and in so doing elevate the general level of prosperity. In terms of social development, roads were considered the bearers of civilization: the savagery of the isolated communities would come to an end once they were connected to the road network. The Dutch government of the Netherlands Indies on the other hand focused on increasing the total agricultural production, rather than attempting to more efficiently balance supply and demand. The irrigation engineers constituted their work as an ethical and civilizing practice under the motto "civilization begins at the stomach."[302]

It is striking that in the American colony the plans of the civil administration and those of the engineers of the BPW ran in parallel: both embraced roadwork, especially during the time that Forbes was responsible for the operations of the Bureau. In the Netherlands Indies

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[299] See for example "Ancient empires and their roadways," *Bureau of Public Works Quarterly Bulletin* 2, no. 3 (October 1st 1913): 40, which mentions Egypt and Nineveh amongst others; these two are also mentioned in relation to irrigation in Charles G. Cramer, *De Ingenieur in Ned.-Indië op technisch en social gebied* (Amsterdam: F. van Rossen, 1914), 11.

[300] R.A. van Sandick "De irrigatie in tropische en subtropische landen op het Institut Colonial International te Wiesbaden," *De Ingenieur* 19, no. 22 (1904): 381-383.

[301] Wim Ravesteijn, "Nederlandse ingenieurs overzee: de ontwikkeling van de moderne irrigatie op Java, 1832-1942," *Tijdschrift voor Waterstaatsgeschiedenis* 7(1997): 106-115, 106.

[302] Cramer, *De Ingenieur in Ned.-Indië op technisch en social gebied*, 12.

the competition between the railway engineers and the irrigation engineers did not produce a practical primacy of one technical field over all others as it did in the Philippines. But the “lobby” of the latter group did succeed in portraying and securing irrigation as a uniquely ethical practice, an image the irrigation engineers vigorously policed and protected. Consequently, the vast majority of the BOW directors were drawn from its cadre of irrigation specialists.

## 3.4. Additional developmental strategies

The fact that roads and irrigation emerged as the respective core civilizing tools of the engineering Bureaus in Manila and Weltevreden did not mean that other technical fields could not be considered "benevolent" or "ethical" too. The engineering projects that were closely related to the efforts to improve hygiene in the colonies come to mind as clear illustrations of this point. Sanitation infrastructure and clean water supplies were geared towards preventing outbreaks of epidemic disease like cholera and dysentery, while improvements in drainage also helped to combat malaria. The boring of artesian wells to provide clean water had a long history in the Netherlands Indies, dating back to the seventeenth century, and the BOW took up the task of drilling the wells for the indigenous population from the earliest days of the Bureau.[303] The many mentions in the Philippine Commission Reports and the *Quarterly Bulletin* of artesian well boring for the promotion of the well-being of the Filipinos, and the process that led to the building of the Osmeña waterworks, indicate that the American colonial government and the BPW also expended considerable effort on providing clean water.[304]

Furthermore, American and Dutch colonial engineers were at times inspired by the progress made in public works abroad and sought to emulate those achievements in their own locales. We have already seen in the segment on "Java" how the personnel of the BPW looked to the examples of British India and especially Java in search of ways to enhance the agricultural output of the Philippines. When Forbes replaced Beardsley with James F. Case as director of the BPW in late 1908 – because Forbes, then still secretary of commerce and police, found Beardsley's management of the Bureau insufficiently dynamic [305] – the former head of the Bureau was sent to study the irrigation methods in use in several colonies, including Java.[306] He submitted his report in 1909, and in the years that followed the Americans steadily ramped up their ambitions in the field. They proudly featured their plans on a two-page spread in a glossy pamphlet propagandizing the work of the BPW which they

[303] Ravesteijn and Kop, *Bouwen in de Archipel*, 204.
[304] By June 30th 1912 the BPW's separate artesian well division had successfully struck 684 wells in the Philippines. Greene, "Annual Report of the Director of Public Works, 1911," 41.
[305] Halsema, *E. J. Halsema, colonial engineer*, 19, 31.
[306] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1909*, 141; James Wallace Beardsley, *Preliminary report on Irrigation in Java* (Manila: Bureau of Printing, 1909)

distributed at the Philippine Carnival of February of 1911.[307] However, just four months later their first large project at Tarlac failed, leading to the reorganization of the irrigation division.

The limited progress of irrigation would long continue to disappoint, at least going by the leading article that Chief Designing Engineer of BPW C.E. Gordon penned for a 1916 issue of the *Quarterly Bulletin*. While development in the fields of sanitation and health had been "excellent", he found that "[t]he great and outstanding shortcoming of the present time is the development of the agricultural potentialities." BPW personnel would do well to follow the meticulous planning methods in use in India and on Java, where Gordon saw a much better record of success, adding that "[e]mulation in [sic] the better activities of foreign states is not derogatory, but desirable."[308]

The Dutch personnel of the BOW in turn saw public works being constructed in the Philippines that drew their attention. The American engineers in the Philippines had taken up the issue of sanitation engineering immediately after their arrival. The Philippine Commission had found that "[t]he sanitary condition of the city of Manila at the date of American invasion resembled that of European cities in the seventeenth century."[309] They met the challenge head-on and with considerable success: mortality rates due to infectious disease had declined sharply in their wake. It would take much longer for their colleagues in the Netherlands Indies to put sanitation on the agenda: only in 1915 was a separate division set up for the task within the BOW.[310]

Support for greater engineering intervention in the public health programs had been growing among the Dutch engineers in the preceding years. In the metropole the *Sociaal-Technische Vereeniging van Demokratische Ingenieurs en Architecten* (Social-Technical Society of Democratic Engineers and Architects) was founded in 1904 to promote technical solutions to improve the wellbeing and prosperity of the population.[311] Amongst the activities of the Society was the organization of lectures for Delft students, like the one given by

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[307] The pamphlet also mentioned other engineering work, and if the order and amount of pages allotted to each field are an indication of the importance of the works then irrigation was still clearly overshadowed by roads: the two pages on irrigation were preceded by four on roadworks. Artesian wells and the Osmeña waterworks came after irrigation, though, and each only received a single page of space. "*The Philippine Carnival, February 21-28, 1911. Bureau of Public Works*," File 7152, enclosure 16; General Classified Files, 1898-1945; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[308] C.E. Gordon, "Water supply and irrigation," *Bureau of Public Works Quarterly Bulletin* 5, no. 2 (July 1st 1916): 2-4, 3.

[309] United States Philippine Commision, *Report of the Philippine Commission to the Secretary of War, 1902*, 309-310.

[310] Ravesteijn and Kop, *Bouwen in de Archipel*, 209.

[311] "Sociaal-Technische Vereeniging van Demokratische Ingenieurs en Architecten," *De Ingenieur* 19, no. 32 (1904): 584.

Charles G. Cramer in 1914 on the socio-technical role of the engineer in the Netherlands Indies.

Cramer was an irrigation engineer in the colony, and was the secretary of the *Vereeniging van Waterstaats-ingenieurs* (Society of waterstate engineers) in the Netherlands Indies. The society had been founded in 1913 and gradually enticed almost every irrigation engineer working in the archipelago to join its ranks.[312] During his time on furlough in the Netherlands Cramer acted as the Society's representative, so that the opportunity to speak at the alma mater of nearly every Dutch engineer was a fine opportunity to propagandize the work in the colony. He cited the harrowing mortality figures caused by epidemic disease among the indigenous population living in the large cities of Semarang and Batavia to argue for more improvement in sanitation.[313] He revealed his technocratic tendencies by claiming that issues of hygiene could only be dealt with adequately by engineers and medical professionals because the BB was – one detects a hint of sarcasm in his speech – "too busy with all kinds of administrative work."[314]

Cramer's hosts published his speech as a booklet (in part to boost the chapter of their society they had set up in the colony in the same year) and, not unexpectedly, it received a favorable review in the journal of the *Vereeniging van Waterstaats-ingenieurs*.[315] But even though the journal was conceived as a platform for promoting the parochial professional interests of its members, it still had an outward-looking interest in engineering practices in use elsewhere. For example, its editors were favorably impressed by the work of the corps of sanitary-engineers working in the Philippines, and suggested that a division might be set up in the Netherlands Indies along similar lines.[316]

Dutch colonial engineers, like their American colleagues, thus expanded their arsenal of technical solutions to social problems and developed their ideas in a context that was broader than their own respective colonies and metropoles. Furthermore, prominent employees of either public works department – particularly in the Netherlands Indies – claimed to possess a special mandate to deal with the issue of public health. To support this technocratic claim, the engineers referred to the belief their profession had a powerful

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[312] "Het eerste lustrum der Vereeniging van Waterstaats-ingenieurs in N.I.," *De Waterstaats-ingenieur* 5 no. 4 (April 1917): 147-151, 148.
[313] Cramer, *De Ingenieur in Ned.-Indië op technisch en social gebied*, 28-31.
[314] Ibid., 36.
[315] "De Ingenieur in Nederlandsch.-Indië op technisch en sociaal gebied," *De waterstaats-ingenieur* 3, no. 5 (1915): 389.
[316] "Sanitary engineers op de Filipijnen," *De waterstaats-ingenieur* 5, no. 5 (1917): 232-234.

component of *social* as well as *technical* authority: they were supposedly experts of the improvement of society as well as technology.

## 3.5. Shortages of personnel: only vigorous men need apply

James Wallace Beardsley was faced with a daunting challenge as the chief consulting engineer of Taft's Philippine Commission: he had to create an engineering bureau from scratch and staff it. Finding sufficient numbers of trained engineers was particularly difficult, and the issue of personnel shortages was a problem that would continue to dog the BPW throughout much of its existence. At the BOW, the situation was no different. Even though the number of trained irrigation engineers more than doubled between 1910 and 1920 (after having remained steady at slightly less than one hundred men in the preceding decade) many articles in *De Ingenieur* and *De Waterstaats-ingenieur* were dedicated to uncovering the causes for the apparent difficulty of attracting staff in adequate numbers. In their written correspondence and journal submissions on the topic, the personnel of both Bureaus and those sympathetic to their cause articulated their vision of what the ideal recruit – and by extension, colonial engineer – looked like and how they could be drawn to the colony. This section will draw into focus what that vision was, and explore the strategies the engineers turned to in their search for new recruits.

Beardsley could count on the support of Taft in the years that the latter was seated in the Philippine Commission. Taft submitted a request in early 1901 to the Bureau of Insular Affairs (BIA) asking it to reach out to engineering colleges to entice recent graduates to come to Philippines. The BIA followed up on the request in May by sending letters to the presidents of the engineering departments of some seventy approved schools. Not all schools on the list were American: the School of Practical Science in Toronto and the Technical University in Munich were also included, though they were added to the list later in handwriting.[317] But even when the BIA appeared to have succeeded in its recruiting effort, it still suffered setbacks: from the first batch twelve engineers it had selected two withdrew in the weeks that followed.[318]

Because engineers working for the Philippine Commission were to be employed by the federal government, their hiring took place through the system of the Civil Service Commission. By demanding that aspiring applicants for federal jobs pass examinations, this

[317] Clarence R. Edwards, Chief of Bureau of Insular Affairs, to the president of the University of Michigan (engineering department), Washington D.C., May 5th 1901; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[318] Clarence R. Edwards, Chief of Bureau of Insular Affairs, to William H. Taft, President of the Philippine Commission, Washington D.C., June 22nd 1902; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

institution saw to it that they entered into service on the basis of their merits rather than through patronage relations. But in 1902 none of the men on the Civil Service Commission's list of available personnel were willing to take up a post in the Philippines.[319] This pattern of eligible men declining jobs in the colony continued in the years that followed, so that assistant chief of the BIA Frank McIntyre began looking to the workforce of other federal departments such as the Reclamation Service in hopes of finding suitable personnel for service in the archipelago. These efforts failed on account of the wages offered being too low.[320] The difficulties in attracting adequate numbers of staff must have been well known outside the BIA because McIntyre was approached in 1907 by headhunting agencies in the United States offering to supply him with the men he needed.[321] But even their mediation was no panacea: McIntyre found that the men put forward by the "brain brokers" of Hapgoods Inc. in most cases were not trained for the specific tasks that awaited them in the Philippines or were too old,[322] whereas none of those recommended by the Cleveland Engineering Agency (which submitted a sample list of candidates it described as "live" and "capable"[323]) had passed the civil service exams.[324]

Frustration with the troublesome state of affairs was mounting in Manila. Beardsley, who had personally gone on the hunt for suitable candidates in late 1906 when he made plans to visit several technical colleges in the United States,[325] cited several reasons for the continued shortage of personnel in his 1907 report as director of the BPW to the Philippine Commission. He acknowledged that pay was too low and career perspectives too limited to compete effectively with employment in the United States. But he also implied that

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[319] Clarence R. Edwards, Chief of Bureau of Insular Affairs, to William H. Taft, President of the Philippine Commission, Washington D.C., October 24th, 1902; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[320] H. Sleeper, Director of Lands, to the Executive Secretary, through the Director of Public Works, Manila P.I., January 28th 1907; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[321] H.L. Wilson, manager technical department Hapgoods Inc., to Capt. Frank McIntyre, War Department, New York, January 31st 1907; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[322] Capt. Frank McIntyre, War Department, to H.L. Wilson, manager technical department Hapgoods Inc., Washington D.C., February 4th 1907; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[323] F.G. Straud, manager of Cleveland Engineering Company, to Capt. Frank McIntyre, War Department, Cleveland, May 8th 1907; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[324] Capt. Frank McIntyre, War Department, to F.G. Straud, manager of Cleveland Engineering Company, Washington D.C., May 13th 1907; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[325] James Wallace Beardsley, director of Department of Public Works, to Chief of the Bureau of Insular Affairs, Cortland NY, August 31st 1906; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

compliance with the regulations of the Civil Service imposed costs aside from the benefits.[326] Those costs stood in the way of finding what the Philippine service needed: "more particularly young men, recent graduates, healthy morally and physically."[327]

W.S. Washburn, at the time the head of the Civil Service Bureau in Manila, rejected this kind of criticism of the examination system. In a personal letter he wrote to McIntyre to specifically address the staff problems at the engineering department, he presented what he perceived to be the causes of the problematic situation. For one, the negative portrayals in American periodicals of the conditions in the archipelago appeared to be hampering the recruitment effort. Washburn was under the impression that the authors of those depictions "have been industriously writing about the climate of the Philippines, emphasizing its unhealthfulness and the dangers upon attending residence here by the white men"—even though he believed the statistics made available by the Bureau of Health on the islands did not support such assertions. These negative depictions of the islands turned away otherwise interested applicants. Furthermore, open positions were insufficiently announced in engineering periodicals. Washburn feared that unless action was taken to countermand these problems – for instance by having the War Department publish reports detailing the benign conditions in the archipelago – the civil service selection system was in danger of being done away with. Due to his conviction that the professional challenges of the work in the Philippines were greater than those faced by engineers working the United States, he stressed that it was vital that "superior men" of above average qualities be found for the service, something only the selection system could guarantee.[328]

Washburn's fears were not unfounded. In the following years the engineers in the Philippines indeed attempted to partially circumvent the Civil Service System—but they managed to gain an endorsement of their plans from Washburn's successor B.L. Falconer. He underwrote a 1910 plan of Chief Engineer of the BPW C.M. Pritchett to send letters to professors at ten engineering colleges, asking each of them to provide the names of two promising students equipped with "good ordinary horse sense" and capable of working independently. The students would be promised positions at the BPW prior to completing the Civil Service exams. The letter concluded by praising the opportunities afforded by the

[326] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1907,* vol. 2 (Government Printing Office, 1908), 384.
[327] Report by James Wallace Beardsley, 1906; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.
[328] W.S. Washburn, Director of Bureau of Civil Service Manila, to Frank McIntyre, War Department, Manila P.I., December 14th 1907; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

Philippine Service, and in a slightly unsettling attempt to allay any concerns about life on the islands, ended with Pritchett's remark that "[t]he tropical climate is delightful, and the death rate among Americans is far lower than any state I know of in the Union."[329]

Only two letters were sent before Clarence Edwards, the Chief of the BIA, caught wind of the scheme and sent an urgent memorandum to the Secretary of War, requesting that he be allowed to alert Governor-General Forbes to "in order that we may prevent the spread of this evil against civil service principles."[330] Ironically, Edwards had himself had contributed to the search for potential recruits for the Philippine engineer corps a decade earlier, and perhaps it was this perceived insult of being circumvented that made him resort to such hyperbolic language. Regardless, it was effective: communications between Washington and Manila and within the administration of the colony itself show that the BPW was put back in line with the civil service regulations.[331]

Despite the various obstacles to recruitment, American engineers had begun to make their way to the Philippines in significant numbers in the years prior to the dust-up between the BPW and the Civil Service. One of them was Halsema, the later designer of the Osmeña waterworks. He had spotted an ad for the position of civil engineer in the colony in a March 1908 issue of *Engineering News*, did well on the exams, and embarked for Manila less than half a year later with seven other recruits. Not all of them were Americans; he was accompanied by a Russian and a Swedish colleague.[332] They officially joined the BPW the following year, when some fifty-four new engineers in total joined the Bureau. Its personnel now numbered 860, twice the figure it had been just twelve months earlier.[333]

Although this enormous growth rate tapered off in the years that followed, the Bureau could boast over 1,600 employees by mid-1912, when it was at its largest; a slow but steady decrease set in thereafter.[334] About two-thirds of the personnel employed were Filipino, the rest American—but its corps of trained engineers, slightly over a hundred men when total

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[329] C.M. Pritchett, Chief Division Engineer of the Bureau of Public Works in Manila, to Prof. J.S. Coon, Georgia School of Technology, Atlanta, Ga., Nov. 2nd, 1910; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[330] Clarence R. Edwards, Chief of Bureau of Insular Affairs, memorandum for the Secretary of War, Washington D.C., January 25th 1911; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[331] Warwick Greene, Director of Public Works, to C.A. Elliott, Manila P.I, January 30th 1911; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD and B.L. Falconer, Director of Bureau of Civil Service Manila, to Frank McIntyre, War Department, Manila P.I, May 19th 1911; Civil engineers; General Record, 2791; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.

[332] Halsema, *E. J. Halsema, colonial engineer*, 19.

[333] Ibid., 49.

[334] Commission, *Report of the Philippine Commission to the Secretary of War, 1912*, 148.

Bureau employment peaked, were almost exclusively Americans. The attrition of personnel was also slowing over the course of this period, with the average duration of time employed in the colony doubling to almost four years in the 1911-1915 period.[335] Interest in their work was also growing in the United States itself: articles on their efforts appeared in leading journals, and Beardsley was invited to speak at Clark University to tell of the progress in the field of public works in the Philippines.[336] Unbeknownst to the Americans working for the BPW, these would be their golden years at the helm of the Bureau.

The American engineers who left for the Philippines did not receive any kind of preliminary training for their new work environment: Halsema, for example, had to learn Spanish while being there.[337] The Dutch engineers, one the other hand, had the option of taking classes on Javanese during their studies in Delft, unless they enrolled in the irrigation curriculum: in that case learning the language was actually a mandatory part of their education.[338] Those who arrived unprepared in the Netherlands Indies might face trying times during their time in the colony. One individual who became particularly embittered during his years in the archipelago was the railway engineer Bastiaan de Roever, who wrote a retrospective of his three years in the colony for his wife. Although he appears as a deeply cynical man, finding fault with almost everything, everywhere and anyone – with the exception of the city of Paris, where he spent a week and for once did not complain of the boredom that plagued him everywhere else – his fascinating outsider account deserves to be treated in detail because it illuminates the sense of isolation and exclusion that a person unfamiliar with Dutch colonial society might feel.

De Roever, born in the Dutch city of Den Helder, had traveled far and wide by the time he committed his experiences to paper in Santiago in 1909. Prior to his voyage to the colony, had been employed by the *Nederlandsche Zuid-Afrikaansche Spoorweg Maatschappij*, a railway company in South Africa. His employment there ended when the outbreak of the Boer War led to his expulsion from the country. De Roever, by then already in his late thirties, and his wife Lientje thereupon decided to try their luck in the Netherlands

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[335] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1911* (Government Printing Office, 1912), 108; United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1915* (Government Printing Office, 1916), 126.

[336] James Wallace Beardsley, "The progress of public works in the Philippine Islands," *Journal of Race Development* 1, no. 2 (1911): 169-186. G. Stanley Hall, the founder of the university, reprinted the address in the *Journal of Race Development*, which he and George H. Blakeslee – the organizer of the 'Conference upon the Far East' which Beardsley contributed to – had recently launched. The journal has been called 'the first American journal in the international relations field.' William A. Koelsch, "G. Stanley Hall, child study, and the teaching of geography," *Journal of Geography* 101, no. 1 (2002): 3-9, 8.

[337] Halsema, *E. J. Halsema, colonial engineer*, 1-2, 13.

[338] C. Disco, *Made in Delft: professional engineering in the Netherlands 1880-1940* (s.n., 1990).

Indies where he had found a job at the Semarang-Cheribon railway. Traveling south through Europe in late 1901 on the way to the port of embarkation in Marseille, he had his first experience with the racial boundaries that defined personal relations in the Netherlands Indies when he met an "Armenian" who hailed from the colony and was on a return voyage to Soerabaja. De Roever made pleasant acquaintance with the man who told him he had made his fortune in trade and, opening up about his personal life, told him that his hopes to marry the daughter of a Dutch army officer had recently been dashed when her family rejected him. The reasons for the rejection would become clear to De Roever when he experienced social relations in the colony firsthand: the Armenian, with his dark skin tone, was not accepted by the European caste in the Netherlands Indies society that was so bound up in its obsession with "whiteness."[339]

De Roever would soon learn that the boundaries were not only of a racial, but also of a class nature. Arriving in Batavia he was struck by how posh the Dutch comported themselves and how infectious this behavior was. When Lientje ran into their old friend Bloem, a jovial fellow when they had last seen him six years before, and jumped at him to greet him, he took off his hat, bowed, and greeted her with "madam." To De Roever's regret, Bloem had been transformed into a "gentleman"—but obviously not in a good sense.[340] He soon discovered what appeared to him to be the strict rules that governed personal relations: in order to elicit a greeting from anyone, it was first necessary to make a formal visit to their home and make acquaintance; and when passing in the street the party with the lowest salary was expected to extend their greetings first. The incessant and obligatory social gatherings that defined evening life also appeared to De Roever to follow a strict script. When the company was entirely European, then all would complain about the Indonesians and laugh at their expense. But when company was mixed, a paranoid pall fell over all who were present, and in this atmosphere of distrust the only permissible topic of discussion was careerist talk of salaries and promotion.[341]

As a "*baroe*" or newcomer in the colony, De Roever felt like he was being deliberately left to his own devices to learn these rules.[342] This sense of exclusion was exacerbated by what he felt was the unbridgeable distance between the Europeans and the Indonesians. When he asked an *indo* for directions the reply came with a "sweet smile", but he had no doubt that

[339] Bas de Roever, Letter to Lientje de Roever, Santiago, September 27th 1909 [The letter was made available by Arend de Roever, Amsterdam, Netherlands. Letter used with permission.], 2.
[340] Bas de Roever, Letter to Lientje de Roever, 3-4
[341] Ibid., 9.
[342] Ibid., 6.

the man "was cursing me in his heart." He believed that the Javanese were "a people that has never been understood by a European and never will be," revealing that he was not sanguine about the chance that the Dutch project to uplift the colony might succeed. The yawning divide between himself and the indigenous population developed into a feeling of pressing claustrophobia, especially at night: "outside it is dark, pitch dark when there is no moon, Javanese shuffle on by, invisibly. Lizards on the ceiling, against the wall, a gecko chatters, laughing at the European lost so far from home."[343] Bastiaan and Lientje came to detest the nights, when it always felt like an "invisible force" pressed upon him.[344]

De Roever's professional life could not improve his mood either. The bureaucratic formalities that accompanied work, the never-ending streams of official communications, and the posh behavior of his colleagues stood in the way of getting the job done. On several occasions De Roever acted promptly and of his own accord to repair damage done to the tracks by *bandjirs*, each time on the way back meeting his colleagues who had spent the previous hours and days in intense deliberations on how to solve the problem only to find it – to their anger – resolved already.[345] When the promised pay raises and promotions were not forthcoming, De Roever and Lientje left Semarang, "that accursed mosquito ballroom", for the Netherlands.[346] Standing on the deck of their ship, they watched the islands disappear behind the horizon, "where we lost three years of our lives."[347]

Looking back on his miserable time in the Netherlands Indies, De Roever felt that his relatively advanced age had made his attempts to adapt to society in the colony difficult. That task was further complicated by the perceived unwillingness of the other Dutch in the colony to introduce a *baroe* like him to their ways. His experiences were apparently part of a larger problem: those who wanted to work in the colony, even if they were enthusiastic about the prospect, had to surmount several obstacles. For instance, when a Dutch journalist returned from the colony and wrote an article in 1909 stating that "the Indies need vigorous young men"[348], he received a hundred letters from youthful male readers who were interested in working in the colony and inquired whether the author could help them secure a position. The author found their request surprising, as Minister of Colonies van Heutsz (the military officer

[343] Bas de Roever, Letter to Lientje de Roever, 18.
[344] Ibid., 11. It is unknown whether De Roever took his phrase "onzichtbare kracht" in part from Louis Couperus' novel *De Stille Kracht*, but it certainly shows how prevalent the sense of widespread mysterious forces and their claustrophobic effect was.
[345] Ibid., 15-16.
[346] Ibid., 7.
[347] Ibid., 24.
[348] "Indië heft flinke jonge Nederlanders nodig," *De Gids* 31 no. 1 (1909): 244-245. The article references the work of the journalist Ch. Boissevain who wrote for the *Alg. Handelsblad*.

that pacified Aceh held the post between 1904 and 1909) had often lectured that too few Dutch made themselves available for working overseas. Clearly, the supply and demand of labor for the colony were not operating in tune.[349]

That problem would also emerge at the BOW around the same time. The Bureau drew its personnel almost exclusively from the *Technische Hoogeschool* in Delft, but even though students of civil engineering could follow a curriculum on irrigation and learn Javanese there, much would remain to be learned once they ventured to the Netherlands Indies. In his inaugural address as the first professor of irrigation studies at Delft (the special chair was not set up until 1906), P.Th.L. Grinwis Plaat told his audience precisely that. The unfamiliar climate, uncharted terrain, and high degree of operational independence that was immediately required of new recruits all conspired to make work in the colony much more challenging for a young engineer than in the Netherlands. However, Grinwis Plaat reminded all present of the broader horizons that awaited anyone willing to make the leap to the Indies—and that from now on, as the special chair of irrigation studies he would help ease any future difficulties they might face by making his own experiences as former employee of the BOW available in the Delft classroom.[350]

Despite the propagandizing of the engineering occupation in the Netherlands Indies by Grinwis Plaat and his successors, the BOW faced a sharp shortage of irrigation engineers in the years that followed. By 1912 the shortfall was estimated at 30 to 35 engineers.[351] The corps of railway engineers in the Netherlands Indies was also short many hands. This mounting problem was not unexpected, nor had it gone unnoticed in the Dutch engineering community. As early as 1907 the *Vereeniging van Delftsche Ingenieurs* established a committee, in which Grinwis Plaat was also seated, to investigate how the need for engineers in the colony could best be met. Their findings were used by the VDI the next year when it sent a missive to Van Heutsz warning him about the high attrition rate at the Bureau and Staatsspoorwegen. Four years later they repeated their concerns to his successor Idenburg when circumstances were still dire, reprinting their letter to the minister in their journal *De Ingenieur* that they co-published with the KIvI.[352] Throughout the year the topic would receive a great deal of attention in letters submitted by readers, comments from the editors,

[349] "Indië heft flinke jonge Nederlanders nodig," 244-245.
[350] P.Th.L. Grinwis Plaat, "De opleiding van den civielingenieur voor den Indischen dienst", rede uitgesproken door P. Th. L. Grinwis Plaat bij de aanvaarding van het ambt van buitengewoon Hoogleraar in de Waterbouwkunde aan de Technische Hoogeschool te Delft den 28 september 1908," *De Ingenieur* 25 no. 10 (1908): 732-742.
[351] "Begrooting van Ned.-Indië voor 1912," *De Ingenieur* 26 no.50 (1911): 1071-1072.
[352] "Vereeniging van Delftsche Ingenieurs," *De Ingenieur* 27 no.1 (1912): 2.

and transcripts of the conferences where the subject was inevitably brought up. Most were in agreement that the wages paid during the first years of employment by the government were not competitive with those of the booming private sector in the Netherlands and the colony.[353]

But many of those writing in the pages of *De Ingenieur* believed that the issue of high tuition costs at Delft was an even greater problem that the unfavorable conditions of employment. They contended that instead of trying to obtain a higher share from the pool of graduates for the colony, the size of the graduate pool ought to be enlarged by attracting more students. Many schemes were floated to help aspiring engineers overcome the hurdle that tuition posed. The VDI argued in favor of reintroducing the old system that allowed students to enter into employment agreements with the government while their education was still ongoing in return for an annual stipend; others favored a scholarship for all who attended classes at Delft.[354] The exponents of the various plans each extolled the virtues of their specific solutions. For example, J. de Booy, a former chief engineer of the *waterstaat* in the colony, supported the introduction of a large lump sum to be paid out upon graduation. He disapproved of the incentives created by re-introducing the offers of early employment; he contended that those students who consented to these kind of schemes effectively allowed themselves to be "sold", which he considered a sign of bad character. Instead, "what is needed over [in the Netherlands Indies], are assertive men of character, with knowledge of the world, life, and the people in it. The highest percentage of them can be found amongst those who have sacrificed one or more years to extracurricular activities – by committing themselves to special studies, through vigorous participation in fraternity life, etc." By postponing payment until graduation, such "men of character" who hailed from the halls of *Delftsch Studenten Corps* could be secured for colonial service.[355]

The sense of urgency expressed in *De Ingenieur* for finding ways to resolve the personnel shortage at the BOW was strengthened by the recent affront the colonial engineers suffered at the hands of the Dutch government: the latter had begun to hire foreign engineers for the colonial service. In 1912 the BOW gained twenty-nine foreign recruits, and the Staatsspoorwegen twelve. Two years later twenty per cent of all BOW-personnel were

[353] "Statistieken over 1846-1912 omtrent het aantal te Delt gediplomeerde ingenieurs, werkzaam geweest of nog werkzaam in Nederland, Nederlandsch Indië, of het buitenland," 28 no.24 (1913): 477-481, and R.A. van Sandick, "Buitenlandsche ingenieurs in Nederlandsch-Indischen staatsdienst," 1913, no.48: 1033-10 34.
[354] Respectively, "Vereeniging van Delftsche Ingenieurs," *De Ingenieur* 26 no.1 (1912): 2, and "Begrooting van Ned.-Indië voor 1912," *De Ingenieur* 25 no.50 (1911): 1071-1072.
[355] J. de Booy, "Nog eens de recruteering van de Delft gediplomeerden voor den Dienst in Ned.-Indië," *De Ingenieur* 26 no.3 (1912): 67-69.

Danish, German, Austrian or Swiss.[356] Van Sandick and the board of the VDI, as well as many of its members, found this to be an appalling turn of events. They were of the opinion that the government, instead of increasing the inadequate wages that had contributed to the personnel shortage, was dodging its responsibilities by attracting cheap foreign recruits to fill the empty positions.[357]

That was certainly how it was perceived by the irrigation engineers working in the Netherlands Indies, who were becoming increasingly disgruntled with their employer. In 1913 they set up the *Vereeniging van Waterstaats-ingenieurs* to promote their "common interest", an agenda that during its first years was synonymous with their demand for "*positieverbetering*": an improvement of their terms of employment. The campaign had originated with Cramer,[358] who articulated the hopes and grievances of the *waterstaat* personnel in the colony to an audience of VDI members during his 1913 furlough in the Netherlands. He lectured them on how the government had recently reneged on promises made to long-serving BOW-personnel when it instituted new, unfavorable rules on promotions and pay raises.[359] This had soured the atmosphere at the Bureau, a worrisome development in and of itself.[360]

After presenting solutions to the problem, Cramer moved from the "prozaic materialistic theme of reimbursements" to another one close to his heart: "the invasion of the Indies by engineers with foreign diploma's and the army corps of engineers."[361] Assessing their educational backgrounds, he contended that neither group of invaders was trained up to the standard of the Delft graduates. Greater numbers of the latter had to be trained to meet demand, and again the topic of tuition was broached. Cramer favored generous scholarships for all who came out of secondary school with an affinity for engineering. The importance of the *Delftsch Studenten Corps* came up again too: apparently some feared that scholarships

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[356] Ravesteijn and Kop, *Bouwen in de Archipel*, 171-172. "De B.O.W. in Indië," *De Waterstaats-ingenieur* 2 no. 1 (January 1914):23-24.

[357] R.A. van Sandick, "Buitenlandsche ingenieurs in Nederlandsch-Indischen staatsdienst," "Buitengewone algemeene vergadering van de Vereeniging van Delftsche Ingenieurs," *De Ingenieur* 29 no. 6 (1914): 123-124.

[358] During the celebrations of the five-year anniversary of the founding of the *Vereeniging van Waterstaats-ingenieurs*, the president of the society presented an overview of its achievements and credited Cramer with launching the campaign for '*positieverbetering*'. "Het eerste lustrum der Vereeniging van Waterstaats-ingenieurs in N.I.," *De Waterstaats-ingenieur* 5 no. 4 (April 1917): 147-151, 149.

[359] Ch.G. Cramer, "Dienstvoorwaarden en vooruitzichten der ingenieurs in Ned. Indischen staatsdienst," *De Waterstats-ingenieur* 1 no. 5 (November 1913): 102-114, 102.

[360] Cramer was hardly alone in his assessment of the malaise at BOW. J. Kraus and G.J. de Jongh, two prominent engineers and politicians who had been sent to develop a strategy for expanding the port facilities on Java in 1910, took up the issue from their respective seats in the upper and lower chambers of Parliament upon their return. The later director of BOW Ott de Vries acknowledged their findings. P.J. Ott de Vries, "Wenschen en grieven," *De Waterstaats-ingenieur* 1 no. 4 (September 1913): 76-80.

[361] Cramer, "Dienstvoorwaarden en vooruitzichten der ingenieurs in Ned. Indischen staatsdienst," 109.

would attract students from lower class backgrounds and degrade the quality of the graduate pool. Cramer believed that if the scholarships were sufficiently generous then "the young men can become members of the Student Corps, participate in student life more vigorously, and rub shoulders with colleagues hailing from more civilized and developed backgrounds."[362] Cramer and his successor as the representative of the *Vereeniging van Waterstaats-ingenieurs* would meet several times with the Minister of Colonies in the following years to communicate their ideas to the upper echelons of the Dutch government, so that their grievances were well known outside the engineering community too.[363]

There is no doubt that the discontent at the *waterstaat* (and the Staatsspoorwegen) in the Netherlands Indies was widespread and founded in very real disagreements on wage compensation. But a more proximate cause for the personnel shortage was the fact that the BOW was quickly ramping up its activities from the start of the second decade of the twentieth century onwards. In the two years prior to Cramer's lecture the total number of irrigation engineers employed by the Bureau had surged by more than forty per cent to 166 men. Between 1910 and the day Cramer spoke they had irrigated more land than in the entire previous decade, increasing the total areal furnished by modern irrigation by more than half.[364] In other words, the Bureau was growing faster and achieving more than ever; by 1920 it employed more than twice as many irrigation engineers and grew the areal sixfold compared to the start of the century.

What seems to have aroused the anger of the leading engineers of BOW most, then, was the fact that the Dutch government was changing the make-up of its personnel—hence their anger at the appointment of foreign engineers. They believed that the Dutch government had an obligation to serve the interests of the engineers trained in the Netherlands. Prior to the hiring of the foreigners, the Bureau had effectively been a forward post of the Delft engineers, a status they wished to protect. This defensive, guild-like behavior of the employees at the *waterstaat* in the colony explains why they could on the one hand express satisfaction in 1917 that they had made further entry in to the service of foreigners impossible (erroneously, as the number of foreigners would almost triple in the following years) while also railing against the Dutch government for causing the Bureau to be understaffed.[365]

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[362] Cramer, "Dienstvoorwaarden en vooruitzichten der ingenieurs in Ned. Indischen staatsdienst," 112.
[363] "Het eerste lustrum der Vereeniging van Waterstaats-ingenieurs in N.I.," 149.
[364] For figures on the areal, see Ravesteijn and Kop, *Bouwen in de Archipel*, 160. The numbers on personnel are taken from M.A. van Oort, "Promotiekansen in de hoogere rangen van de Waterstaatsingenieurs in Indië," *De Waterstaats-ingenieur* 1 no. 1 (Maart 1913): 30-32, 31.
[365] "Het eerste lustrum der Vereeniging van Waterstaats-ingenieurs in N.I.," 150; "Het tekort van Waterstaatspersoneel," *De Waterstaats-ingenieur* 6 no. 3 (1919): 145.

The Delft identity was made all the more important by the fact that almost all of the old hands at the BOW who had risen to the upper reaches of the Bureau hierarchy had been members of the *Delftsch Studenten Corps*. Just how strong this additional axis of their identity was can be gleaned from the inaugural speech of one of Grinwis Plaat's successors in the irrigation chair of the *Technische Hoogeschool*: he could not neglect to mention to his audience that the two of them had belonged to same *jaarclub* (yearclub) sub-division of the DSC.[366] No doubt many of De Roever's colleagues at the Semarang-Cheribon railway had also been members, and their behavior as members of life-long close knit community, to which De Roever had not belonged, may very well have contributed to his sense of isolation during his time in the Netherlands Indies.

It can be deduced from the absence of complaints about foreign invaders in the Philippine Commission Reports that no exclusionary attitudes of similar strength operated at the BPW in the Philippines. The high rank of division engineer that Burckhardt von Schmeling attained during his service also supports such a conclusion. Furthermore, during his five years in the service of the Bureau he became a beloved colleague of his fellow engineers. Nor was he entirely Americanized. "Von", as he was known to his friends, traveled to the United States on a furlough in 1914, married, and continued on a honeymoon to Germany. When war broke out, he tendered his resignation to the Bureau in order to join the imperial army, but not before consulting with his friends in the Philippines and seeking approval for his decision. They showed understanding, with one of them sending a letter stating that "the slogan, 'my country right or wrong' [is] the only principal which should control true men." Just half a year later Von lay dead on the European battlefields. His colleagues reserved a full page in the *Quarterly Bulletin* for the obituary of their friend.[367]

Aside from this glaring difference, a comparison of the responses by the staff of the BPW and the BOW to their personnel shortage yields several similarities. Initially, their recruitment efforts were hampered by the low wages paid by the central governments. The colonial engineers therefore often painted Congress in the United States and the Ministry of Colonies in the Netherlands as antagonists to their cause for making too little funding available. Cumbersome bureaucracies and red tape posed further difficulties, so that the Bureaus made attempts to either evade these restraints, as was the case in the conflict with the

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[366] "Schets van de ontwikkeling van technische bemoeienis met irrigatie in Indië. Rede uitgesproken bij de aanvaarding van het ambt van buitengewoon hoogleraar in de Waterbouwkunde aan de Technische Hoogeschool te Delft, den 20sten September 191," *De Ingenieur* 30 no. 40 (1913): 845-850, 850.

[367] A. Tansill, "Burckhardt von Schmeling. A builder in the Philippines," *Bureau of Public Works Quarterly Bulletin* 4, no. 2 (July 1st 1915): 3.

Civil Service and the BIA, or relentlessly petitioned and pressured the government, as Cramer and his colleagues did.

These efforts were generally led by the higher-ups of the Bureaus who had already established themselves within the colonial service. During their search for new employees they zeroed in on the technical colleges, where they hoped to find their ideal recruits: young, vigorous men who could adapt to the social and climatological conditions in the colony. In the United States, professors at the universities were called upon to aid in the effort, whereas at Delft former irrigation engineers could take up the special chair for their technical field and propagandize the work in the Netherlands Indies in the classrooms themselves. Additional strategies were also tried: the BIA pored over the lists of men made available by headhunting agencies and Beardsley went on a campus speaking tour to entice students to join his Bureau; in the Netherlands informational booklets on colonial engineering were distributed to attract more interest.[368] The search for new recruits was a constant topic of discussion, with special committees being set up to investigate the causes of the shortage and a flurry of communications being sent to the central government.

Many of those close to the process believed colonial engineering to be particularly challenging so that only those men who possessed outstanding “character” and “vigor” could be expected to successfully perform their duties. Engineers revealed their belief that they belonged to a special occupation in their willingness to operate outside of the normal recruitment channels used by other branches of the colonial government. In the case of the Dutch, this occupational identity was further strengthened by their attachment to their alma mater in Delft and the *Delftsch Studenten Corps* which most of them had been members of. This leads to the interesting observation that while the BPW personnel’s occupational identity is a sufficient explanation for their attempts to circumvent the Civil Service system, the long-serving personnel of the BOW developed an additional guild-like identity that operated in tandem with their engineering identity.

The Delft guild did not succeed in their efforts to maintain the BOW as an exclusive bastion of Dutch engineers. But at the same time the Bureau’s staff grew tremendously, concurrently with the expansion of the BPW in the Philippines. At the start of the second decade of the twentieth century, a new dynamism gripped both Bureaus, and irrigation and roadwork were performed at a faster pace and greater scale than ever before.

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[368] For example, Afdeeling: Informatie-Bureau Vereeniging "Oost En West", *Staats- en partikuliere betrekkingen in onze overzeesche bezittingen, werkkring en vooruitzichten. No.4: de ingenieur in Nederlandsch-Indië* (Den Haag: Martinus Bijhoff, 1914).

## 3.6. Relations with the Filipinos and Indonesians

For three years, starting in 1911, the Resident G.L. Gonggrijp wrote letters to the editor of the Bataviaasch Nieuwsblad in which he commented on his work in the Netherlands Indies. Like nearly all civil service members wishing to speak freely about their line of work, he wrote under a pseudonym; in his case *Opheffer*, or "uplifter." As the name suggests, the civilizing mission in the Netherlands Indies was the central theme of his letters, and he often adopted a wry, ironic style to comment on the topic. But he sometimes veered off in another direction when he expressed a more genial attitude towards Dutch rule. A trip in mid-October of 1912 through the Bengawan-Djero region put him in the latter mood: sailing the Solo river on a small motor cutter, Gonggrijp was treated to a view on the deeply cultivated fields that were expected to produce a bumper crop that year. He surmised that the region, which had been the site of famine and depravation in the past, had finally wrestled itself free from the scourge of drought—and he was convinced that the engineer who controlled the water flows of the enormous region, and who accompanied him on the vessel, should be thanked for that. Whereas competition between Indonesians for water had in the past led to waste and inefficiency, the engineer stepped in to balance interests and provided expert advice, leading the region into progress and prosperity. Clearly impressed by the socio-technical achievements of the engineer, Gonggrijp summarized the trip as a great day in his life as an *opheffer*.[369]

By virtue of the conditions in the colony, the engineer Gonggrijp met had to be a Jack of all trades. Building contractors were generally unavailable in the Netherlands Indies so the engineers often supervised the construction of their designs themselves. This made colonial engineering, and especially the task set of the engineer at the work site, quite different from work in the metropole. It also meant that the engineers of the BOW worked closely with the indigenous population. This also held true for the American engineers working in the Philippines. This section will explore how the engineers defined their relationship with the Indonesians and the Filipinos, and how it was shaped by engineers' strategies for the uplift of indigenous society, their professional ideology and technocratic ambitions, and the practical conditions of their everyday labor.

[369] G.L. Gonggrijp, *Brieven van Opheffer aan de redactie van het Bataviaasch Handelblad* (Maastricht: N.V. Leiter-Nypels, 1944), 262-267.

As was already mentioned above, when employment peaked at the BPW in 1912 it counted many hundreds of Filipinos among its personnel. They worked alongside its corps of American engineers. They usually took up lower-level positions within the administration that required only limited technical knowledge, such as maintenance foreman, overseer, building superintendent, and inspector. In some cases, such as under the *caminero* road maintenance system set up by Cameron Forbes[370], the Filipino employees were required by the district engineers to dress in uniforms to both foster an *esprit de corps* and to make them visible to the indigenous population who could then more easily approach them to inform them about road damage. These foremen supervised small teams of men to assist them in their maintenance tasks, and were provided with funding to hire additional local laborers when necessary.[371]

However, the engineer corps was not exclusively American. In 1911, ten of the 143 engineers were Filipinos. Many of them had been sent to the United States to attend universities under the *pensionado* system that provided them with scholarships paid by the Philippine government. The goal of this educational program was to eventually replace the Americans in the service once Filipinos had been trained in adequate numbers. This objective, the so-called Filipinization of the archipelago's government, had already been formulated during McKinley's administration, and during 1906 almost two hundred Filipinos were enrolled in more than a dozen American universities as *pensionados*.[372] In addition, the University of the Philippines in Manila was reopened in 1908 and offered a degree in engineering to its students. However, to the disappointment of the director of public works, the field attracted little interest: in 1913 only five Filipinos were enrolled in the engineering curriculum, while there were almost a hundred and fifty students on the rolls of the law department and similarly high numbers taking classes in agriculture and medicine.[373]

The engineers of the BPW worked hard to make their organization visible to the public eye. Starting in 1911, they maintained a presence at the Philippine Carnival held in early February in Manila. They distributed flyers extolling the achievements of the Bureau and built a large exhibit where the punters could examine scale models of recently constructed engineering works. During the 1913 Carnival the exhibit on some days attracted more than

[370] May, *Social engineering in the Philippines*, 147-148.
[371] Burckhart von Schmeling, "Maintenance of first-class roads in the Philippine Islands," *Bureau of Public Works Quarterly Bulletin* 1, no. 4 (Januari 1st 1913): 14-21, 18.
[372] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1906*, vol. 1 (Government Printing Office, 1907), 20.
[373] United States Philippine Commission, *Report of the Philippine Commission to the Secretary of War, 1913*, 27.

20,000 revelers. They were treated to a full-size mock-up of an artesian well tower, casting a shadow over the grounds; water flowed through a large reproduction of the proposed irrigation project at Iloilo; and the display of a working scale model of the collapsible bridge at Mañgalden, which with the flick of a switch revealed how a flood would wash away the superstructure but leave the base intact, was visited so frequently and the switch flipped so often that repairs had to be done to the model every night. *Camineros* strutted around in their uniforms, and two BPW floats were entered into the parade, one of them depicting the Bureau and the other roadwork. The wagons garnered a first and second prize in the competitions.[374]

The efforts that the engineers of the BPW expended in this outreach program had a clear goal: strengthening the "good will of the public" that Bureau director Warwick Greene described in the leading article to a 1913 issue of the Quarterly Bulletin as the Bureau's "greatest asset." Good will, according to Greene, could be garnered among Filipinos and Americans in the colony alike by working efficiently and by projecting enthusiasm and energy. For "[w]ithout it our work will drag, halt, and finally end in confusion. With it, we can leave a monumental record in the history of these islands."[375] Of course, the publication of the *Quarterly Bulletin* was itself part of the propaganda strategy of the Bureau: many articles were deliberately written in language stripped of technical lingo in order to be accessible to a wide audience.[376] All these efforts appeared to be working: reports received from several sources that year indicated that the Bureau had a reputation for achieving good results and that it enjoyed good standing with the indigenous population.[377]

Nevertheless conflict did still break out between the BPW engineers and the Filipinos when their ideas of how to develop the infrastructure of a region clashed, as it did in Antique province in 1910. According to BPW regulations roads should always be fifteen meters wide, but in many places in the province they had become considerably narrower because overtime houses had been constructed and crops planted on the embankment. When the BPW engineer Gray was sent to broaden the roads, he understandably met opposition from the Filipinos who did not wish to abandon their homes or cut down profitable coconut trees. Gray then resorted to the use of force: assisted by the constabulary he began to forcibly evict the inhabitants and

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[374] "We Win. Philippine Carnival at Manila, February 1-8, 1913," *Bureau of Public Works Quarterly Bulletin* 2, no. 1 (April 1st 1913): 18-19.
[375] Warwick Greene, "Popularizing the Bureau," *Bureau of Public Works Quarterly Bulletin* 2, no. 3 (October 1st 1913): 2-3.
[376] H.F. Cameron, "Municipal water supply," *Bureau of Public Works Quarterly Bulletin* 1, no. 3 (October 1st 1912): 16-24.
[377] Remarks by chief division engineer E.J. Westerhouse, "Proceedings of the district engineer's conference, held at Manila, P.I., February 4-11 1913," *Bureau of Public Works Quarterly Bulletin* 2, no. 1 (April 1st 1913): 10-18, 13.

destroy part of their livelihoods to reinstitute the road standards in the region. The Filipinos reacted with howls of indignation and sent petitions to the central government to protest the violence Gray visited upon them. Aided by their local assemblies, the protestors referenced the code of law to contend that Gray had acted illegally.[378] While the director of the BPW Greene was not overly sympathetic to their complaints, he was appalled by the behavior of his engineer and moved to reprimand him.[379] In due course the rigorous standards for road width were loosened to avoid further antagonizing the local population.[380] Clearly, in their project to develop the public infrastructure the BPW engineers could not simply brush aside the wishes of the local population, and instead had to respond with compromises to the complaints and opposition they met from the Filipinos.

The responsiveness of the BPW engineers to public opinion was increased in 1913 when the Filipinization program entered into a new phase. The recently elected Democratic President Wilson wished to expedite the independence of the Philippines and sent Francis Burton Harrison to the archipelago to replace Forbes as Governor-General. Under Harrison's tenure, which lasted until 1920, Filipinos were quickly promoted to higher levels of office to replace Americans. The latter's numbers declined from 2600 to 600 during his time in office.[381] In anticipation of the further devolution of power from American administrators to Filipinos – which would be signed into law by Wilson in 1916 with the Jones Act – and the move towards a more representative form of government, the importance of the good public relations of the Bureau were reiterated.[382]

The acceleration of Filipinization also left its mark on the BPW in other regards. The training of indigenous personnel became of greater importance: although it had certainly been an important element of the work of the engineers since the Bureau's creation, it developed into a criterion for promotion in the hierarchy in 1913. Furthermore, the number of Filipino trained engineers began a steady and almost unbroken increase. These indigenous recruits were every bit as capable as their American colleagues—and sometimes exceeded their

[378] Ramon Ibanas, to the Secretary of War, San Jose, Antique, P.I., August 17th 1910; Roads and Bridges; General Record, 2146 ; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.
[379] Warwick Greene, to the Secretary of War, Manila, P.I., September 20th 1910; Roads and Bridges; General Record, 2146 ; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.
[380] Warwick Greene, "Special order no. 32, Manila, P.I., December 26th 1910"; Roads and Bridges; General Record, 2146 ; Records of the Bureau of Insular Affairs, 350; National Archives at College Park, MD.
[381] Bootsma, *Buren in de koloniale tijd*, 30.
[382] Remarks by chief division engineer E.J. Westerhouse, "Proceedings of the district engineer's conference, held at Manila, P.I., February 4-11 1913," *Bureau of Public Works Quarterly Bulletin* 2, no. 1 (April 1st 1913): 10-18, 11.

uplifters too, as the impressive resume of José Paez, the first Filipino to obtain a Master's degree in civil engineering, amply proves:

> "Paez was the best-educated Filipino engineer of his day, with a Bachelor of Arts degree from the Liceo de Manila (received in 1905 at the age of 17) and a Bachelor of Science degree in civil engineering the Swiss Federal Technical Institute at Zurich conferred on him in 1911. After working a year for a bridge company in Berlin, Paez attended Cornell University at Ithaca, New York as a *pensionado*. […] His countrymen were proud of his accomplishments. On Sept. 2, 1912 Manuel Quezon then Resident Commissioner in Washington, took him to meet Brig. Gen. McIntre, head of the Bureau of Insular Affairs. In June 1913 he became the first Filipino to receive a master's degree in civil engineering. He took a semester of additional studies in France before returning to the Philippines to take the Civil Service examination and enter the BPW."[383]

No trained engineers who came from an indigenous Indonesian background appeared on the employee roster of the BOW in the first decades of the twentieth century—although a sizable contingent hailed from the white, "European" class of inhabitants of the Netherlands Indies. They too had taken their classes at Delft, because no engineering institute existed in the colony. But the Dutch engineers, like their American counterparts to the north, also took to educating the indigenous population in less complex technical matters. The *waterstaat* trained so-called *oeloe-oeloe*, who acted as headmen in charge of distributing water fairly among the farmers hooked up to the irrigation systems. They were also responsible for maintaining the network of canals and drainage ditches that extended beyond the technical artifacts constructed by the BOW. As representatives of the indigenous population, but vested with authority by the colonial government, the *oeloe-oeloe* were crucial intermediaries in the relations between the engineers of the BOW and the Indonesian peasant farmers. From a technical and administrative point of view, the *oeloe-oeloe* therefore bear a resemblance to the Filipinos employed under the BPW's *caminero* road system.[384]

In the first decade of the twentieth century a debate took place both inside and outside the framework of the colonial administration on how to allow the indigenous population of the Netherlands Indies participate more in the governance of the archipelago. A sense of urgency gripped many of those contributing to the discussion, because the Indonesians had made the unprecedented move to organize themselves into political movements. *Boedi Otomo*, "the beautiful endeavor", was founded in 1908 by members of the indigenous *priyayi* administrative class who saw the rapid modernization of Japan and wished to speed up the development of Java. Dutch politicians and commentators like Van Deventer and the famous Islam expert Christiaan Snouck Hurgronje responded to the challenge of what they perceived

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[383] Halsema, *E. J. Halsema, colonial engineer*, 114.
[384] Ravesteijn, *De zegenrijke heeren der wateren*, 134.

to be the apparent impending national awakening of the Indonesian people by suggesting that the colonized people should be absorbed into the political system sooner rather than later. The each floated their own ideas, calling either for association or assimilation of the Indonesians, but never strayed from the idea that a dualist structure in which the Dutch would have a powerful and still paramount role in the government should be maintained. Nevertheless, they encountered stiff opposition from the many conservative administrators in the BB who were unwilling to cede any of their power, let alone to the indigenous population who they felt were still entirely unprepared for the task of governing.[385]

While the debate rumbled on and the circle of participants widened, the Sarekat Islam was founded by the Indonesians in the colony in 1911. Originally founded to protect the interests of Indonesian and Arab businessmen against the powerful lobby of Chinese merchants in the archipelago, the organization captured the attention of the Indonesians because of the Islamic mystique that surrounded its initiation rituals. It soon exploded into a mass movement with tens of thousands of Indonesians attending its gatherings, and through the founding of local chapters the Sarekat Islam spread like wildfire through the colony. Although the organization worked to support the Indonesians through non-violent means, often assisting aggrieved parties in taking recourse to legal action to right the wrongs visited upon them, the sudden emergence of Sarekat Islam was very unsettling to the Dutch living in the colony. In some quarters hysterical and hyperbolic rumors of an impending uprising buzzed around. But not all Dutch felt such concern: *Opheffer* welcomed the newly assertive behavior of the Indonesians, who were defending their rights and putting an end to the many wrongs they suffered before Sarekat Islam was around to protect their interests. What was certainly clear from the popular political mobilization, though, was that the political structure of the colony had become obsolete: the forces driving the surging Sarekat Islam would have to be accommodated.[386]

The tentative *ontvoogding* efforts to emancipate the Indonesians, which Governor General Idenburg had already set in motion when he was Minister of Colonies prior to coming to the colony, were sped up. As a manner of experiment responsibilities were devolved in some regions from the BB to indigenous power brokers. Because of continued disagreements among the Dutch on which path of reform ought to be pursued, whole-scale revision of the political system was not effectuated. Nevertheless, the need for new policy was clear. Idenburg's successor Van Limburg Stirum, who took over in 1916, continued to push for

[385] Van den Doel, *De stille macht*, 269-285.
[386] Ibid., 286-298.

reforms that were intended to eventually re-allocate powers held by the central colonial administration to local administrations.[387]

The move towards decentralization would also affect the operations of the BOW as early as the middle of the century's second decade: instead of the prevailing system whereby the headquarters at Weltevreden supervised most of the Bureau's activities, local bureaus were expected to survey and construct projects in due course. This reform proceeded only slowly, however, which led to sharp criticism of the BOW in the press from those who supported decentralization: the Bureau was accused of deliberately frustrating the devolution of central control to the local public works departments. One of the veteran irrigation engineers working at the Bureau's headquarters responded to the charge by arguing that many of the local departments were simply not yet up to the task of designing and supervising complicated works, and pointed to specific districts where decentralization had in fact progressed to a remarkable degree to show the willingness of the BOW to change.[388] His argument was apparently unpersuasive, because the negative image persisted: in an article submitted to the *Indische Gids* two years later the former chief editor of a Soerabaja newspaper maintained that the BOW's personnel at Weltevreden continued to fight decentralization tooth and nail, motivated by an urge for bureaucratic centralization.[389] The conservative, guild-like behavior of the old hands working at the Bureau's central office – as detailed in the previous section – may also very well explain their reluctance to changing the operations of their organization.

While the engineers in the Philippines were working in ever closer contact with the Filipino officials serving on the local councils – Halsema established early on in his career that close cooperation with local power brokers was absolutely vital to success[390] – the Dutch engineers of the BOW closed the gap with the Indonesians more slowly, if at all. Furthermore, the indigenous officials they worked with were appointed by the Dutch, rather than elected as they increasingly were in the Philippines. The Bureau's engineers therefore felt less need to legitimate their work to an Indonesian audience. To wit, the BPW's use of spectacle at the Philippine Carnival to widely propagandize their engineering successes to the archipelago's population had no direct counterpart in the Netherlands Indies. Celebrations were instead

[387] Van den Doel, *De stille macht*, 311-314.
[388] The 1917 issue celebrating the fifth anniversary of the *Vereeniging van Waterstaats-ingenieurs* contained an article written by a long-time employee of the BOW at Weltevreden that was specifically intended to refute the charge that the Bureau was opposed to decentralization. F.W.Th. van Oordt, "B.O.W. contra decentralisatie?," *De Waterstaats-ingenieur* 5 no. 4 (April 1917): 152-153.
[389] H. Tersteeg, "Practische Ethiek," *Indische Gids* 41 no. 1 (1919): 153-161, 155.
[390] Halsema, *E. J. Halsema, colonial engineer*, 114.

restricted to the festive occasions that accompanied the completion of construction of specific engineering feats, and even then these festivities were directed mostly towards the "European" inhabitants of the archipelago.[391]

Despite the segregated lives of the European rulers of the Netherland Indies and their colonized subjects, moves were still afoot among the former to democratize the BB and include the Indonesians in its operations. To an extent the Dutch were caught up in the maelstrom of quickly changing colonial policy throughout the rest of the world. The First World War had thrown the administration of major colonies into flux, especially in the British Empire: in India the rulers resorted to promising their increasingly nationalistic subjects that they would grant them greater self-rule in order to be assured of their support in fighting the war.[392] Although the Dutch remained neutral throughout the conflict, the tactic of disarming the growing nationalism of the Indonesians through greater political representation was also adopted in the colony. The *Volksraad* (People's Council) was instituted and had its first assembly in 1918. It had only advisory capacities, half of its members were appointed rather than elected, and only a miniscule as well as conservative electorate could cast votes for the other half. Despite the toothless appearance, the *Volksraad*, would exert considerable pressure on the colonial government.[393]

But the engineers of the BOW were affected by the First World War through very different channels. Because the conflict posed great problems for shipping between the Netherlands and the colony, aspiring students of engineering were no longer able to make their voyage to Delft. The colonial engineering community responded by creating an ad hoc curriculum to be taught locally to prepare the young men for their future studies at the alma mater in anticipation of the time when peace would allow direct lines of communication with the European motherland to be re-established.[394] Although the plan of the educators was intended to be strictly preparatory and temporary, it strengthened a movement already afoot to

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[391] During the 1902 opening of an aqueduct two distinct though simultaneous celebrations were held: a "European" section where engineers and BB officials were present, and an "indigenous" section organized by the Regent. "Feestelijke opening van het aquaduct te Pontjol," *De Ingenieur* 17 no. 49 (1902): 867. At the 1911 opening of the new harbor works at Soerabaja only Homan van der Heide, Idenburg and the Dutch president of the chamber of commerce spoke. *De Ingenieur* 26 no. 49 (1911): 1049-1056. This pattern persisted: during the festivities accompanying the first operation of a new weir at Krawang in 1925 where the director of the BOW J. Blackstone and Governor General D. Fock delivered long speeches, the Regent Raden Toemenggong Soeriamihardja spoke only very briefly; furthermore, the pictures taken during the day show more "Europeans" than Indonesians participating in the celebration. [The celebratory booklet containing the speeches held and pictures taken at the opening of the Krawang weir was made available to the author by W. Ankersmit, a descendant of Blackstone.]

[392] Van Den Doel, *De stille macht*, 321-322.

[393] Ricklefs, *A history of modern Indonesia*, 204.

[394] "Technisch onderwijs Commissie," *De Waterstaats-ingenieur* 6 no.1 (1918): 37.

found a technical college in the colony. In the pages of *De Waterstaats-ingenieur* the possibilities afforded by a true institute of learning for the engineering occupation in the Netherlands Indies had long been suggested as a possible lasting solution for ending the continuing personnel shortage by providing a greater number of graduates.[395]

Those colonial engineers who supporte a local higher institute of learning in the colony found support in the pages of *De Ingenieur*. A three-man committee of KIvI members, in which chief editor and colonial engineering enthusiast R.A. van Sandick naturally took a seat, wrote a proposal for the curriculum of the hoped-for school and took to lobbying the Governor General to realize their plans.[396] However, the financial contributions necessary to found a school would end up originating in the private sector rather than the colonial government.[397] Aided by private industries, a sum of three and a half million guilders was collected to fund the construction and operations of the *Technische Hoogeschool* which opened in Bandoeng in 1920.[398]

By the time the engineering college in Bandoeng opened its doors the universities in the Philippines had been training engineers for over a decade. The graduates were rapidly absorbed into the BPW when Filipinization gathered steam after 1913, setting in motion the long-term trend of replacing American personnel with Filipino engineers. In fact, the former were removed from service at a faster pace than they could be replaced. But despite the reduction in manpower and the turnover of control from colonizer to the emancipating colonized, morale at the Bureau remained high two years into the newly dynamic Filipinization program, when six districts had already been turned over to Filipino engineers.[399]

The entry of the United States into the First World War dealt a far more powerful blow to the operations of the BPW. The Americans in the service were called up en masse to serve in the armed forces, starving the Bureau of expert personnel it still desperately needed for its operations. The annual reports reveal that by the end of 1917, the number of trained Americans engineers had declined to 43, while the number of trained Filipino engineers stood at 79; nineteen districts had been turned over to the latter's supervision.[400] In the following

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[395] "Reorganisatie van den Waterstaatsdienst," *De Waterstaats-ingenieur* 5 no. 8 (1917): 389-391; F.W.Th. van Oordt, "Nederlandsch hooger onderwijs in Nederlandsch-Indië," *De waterstaats-ingenieur* 6 no.9 (1918).
[396] The committee was founded in October of 1917, and presented its proposed curriculum in issue 18 of the 1918 volume of *De Ingenieur*. F.W.Th. van Oordt, "Het hooger technisch onderwijs in Nederlandsch-Indië," *De Waterstaats-ingenieur* 6 no. 9 (1918): 181-184.
[397] Van Doorn, *De laatste eeuw van Indië*, 35.
[398] J. Klopper, "De Indische technische hoogeschool," *De Waterstaats-ingenieur*," 7 no. 6 (1919): 263-264.
[399] Commission, *Report of the Philippine Commission to the Secretary of War, 1915*, 185.
[400] "Organization and personnel," *Bureau of Public Works Quarterly Bulletin* 7 no. 1 (April 1st 1918): 4.

year these numbers were respectively 37, 88, and 29 (although the number of districts had increased from thirty-one to forty-five by that year).[401] The end of the war relieved some of the stress on the Bureau according to its annual report; nevertheless, just 31 Americans worked alongside 121 Filipinos.[402] Throughout the annual reports, the continued necessity of American guidance in BPW operations was reiterated and concern expressed that under the prevailing personnel shortage little more could be achieved than constructing works that had already been designed—manpower was in such short supply that no new plans could be drafted. The irrigation division was so starved of personnel that construction was shut down completely, and its labor devoted entirely to maintenance.

The rapid departure of the Americans created opportunities for the Filipinos already employed by the BPW. This was particularly true for José Paez, the well-traveled and talented engineer. With just five years in the service of the Bureau he again recorded a first: not only was he the first Filipino recipient of a Master's in civil engineering, in 1919 he also became the first Filipino director of the Bureau. In May of the following year he would in that capacity join the delegation sent by the Philippines to attend the General Engineering Conference in Batavia, where he would rub shoulders with representatives of the American Society of Civil Engineers, dozens of participating Dutch engineers, and even have his photograph taken alongside R.A. van Sandick and Ch.G. Cramer.[403] Speaking on behalf of the Philippine contingent, he told his audience that:

> "The conditions in the Netherlands East Indies appear to us to be entirely the same as those in the Philippines. Similar climate, similar surroundings and needs make our programs of public works roughly comparable. We are presented with the same problems and their solutions can be found in similar ways. That is why we hope that our presence at this congress may serve the common interest. We are convinced that we may learn a great deal from your work, and we assure you that it would be a privilege to us to be of any use to you by presenting our experiences in the Philippines."[404]

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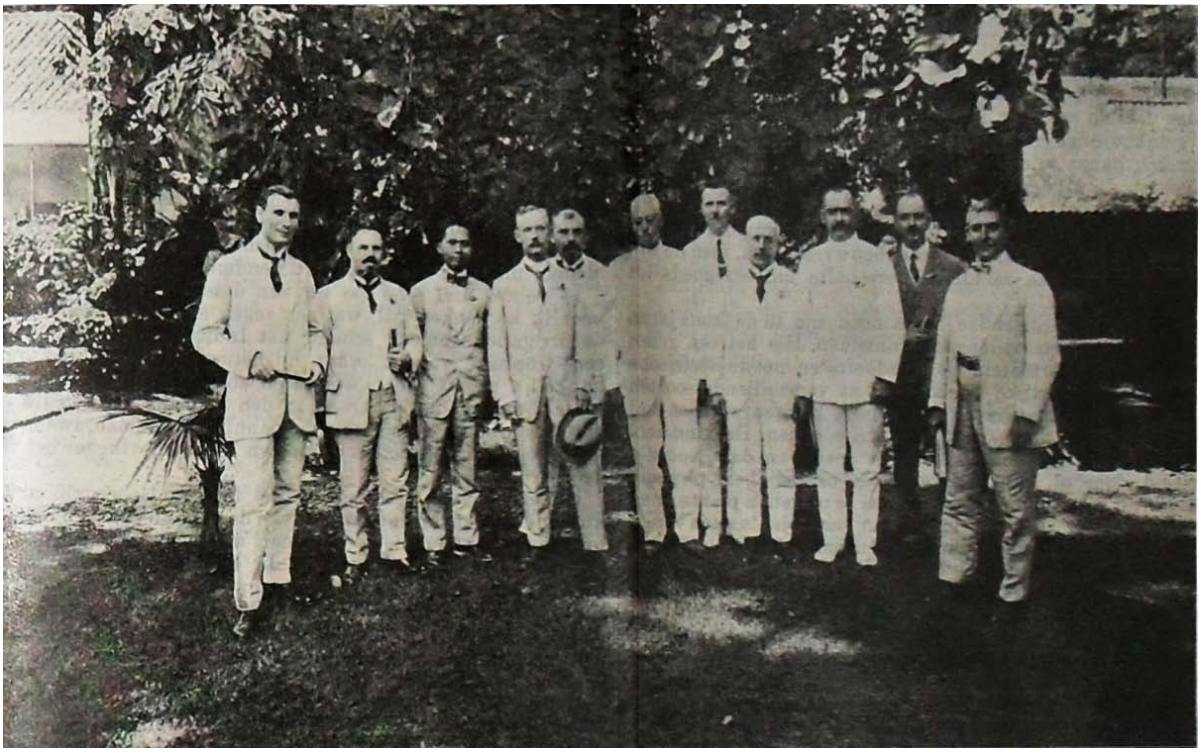
[401] "Organization and personnel," *Bureau of Public Works Quarterly Bulletin* 7 no. 4 (January 1st 1919): 4.
[402] "Organization and personnel," *Bureau of Public Works Quarterly Bulletin* 8 no. 2 (January 1st 1920): 1.
[403] R.A. van Sandick, "Algemeen ingenieurscongres te Batavia, 8-15 mei 1920, II" *De Ingenieur* 35 no. 34 (1920): 608-612.
[404] Translated to English from the Dutch translation printed in R.A. van Sandick, "Algemeen ingenieurscongres te Batavia, 8-15 mei 1920, II" *De Ingenieur* 35 no. 34 (1920): 608-612.



*Participants of the General Engineering Conference held at Batavia May 8-15 1920. Third from left, José Paez; fifth from right, R.A. van Sandick; second from right, Ch.G. Cramer.*[405]

When Paez took to the podium to deliver his flattering speech – confirming the international orientation of the colonial engineers – the golden age of the American engineers of the BPW had already come to an end. Although some of his successors would again be Americans, their domination of the colonial project in the archipelago was a shadow of what it had been in the years before. In the Netherlands Indies, on the other hand, the BOW appeared to be entering new age of success. Armed with a new technical college the days of personnel shortages were expected to soon come to an end. The professional brotherhood of Dutch engineers also appeared to be gaining real political clout in the colony: in 1922 both Soerabaja and Semarang – which, along with Batavia, were among the three largest cities in the archipelago – had engineers as their mayors.[406]

But the future had different things in store for the colonial engineers in the Netherlands Indies. The portents of what was to come were certainly already there. In the second half of the first decade of the twentieth century the Department of Agriculture emerged as a powerful competitor to the BOW in defining the message of material uplift that was part of the Dutch civilizing mission in the colony. More and more, the large scale

[405] R.A. van Sandick, "Algemeen ingenieurscongres te Batavia, 8-15 mei 1920, I" *De Ingenieur* 35 no. 27 (1920): 488-493, 493.
[406] Van Doorn, *De laatste eeuw van Indië*, 122.

technical construction plans of the Bureau would have to compete with agricultural instruction and experimentation of the Department.[407] Decentralization would also be taken to its logical endpoint, dismantling much of the Delft engineers' colonial outpost: the control over the irrigation departments that formed the heart of its *waterstaat* was devolved down to the provincial level in 1925.[408] Finally, the Ethical Policy itself would wind down as the colony entered the third decade of the twentieth century. Although no single moment is agreed upon as the end of this specific mode of civilizing mission and moral duty, the budget cuts instituted by the new Minister of Colonies and Governor General around 1920 curtailed the ambitions of those hoping to develop the colony.[409] Expenditure on irrigation was pared back sharply: the level of annual outlays declined by more than forty per cent in just two years from its peak in 1921, never to reach that high again.[410]

Even more ironically, the technical college at Bandoeng would also help to sow the seeds that led to the end of the grandest engineering project of all: the Dutch colonial project in the Netherlands Indies. In 1921 a young but already ardent Indonesian nationalist by the name of Soekarno entered through the institution's gates to pursue a degree in civil engineering. Five years later he left, as one of the most highly educated Indonesians in the archipelago, and with his nationalism and will to organize opposition to Dutch rule stronger than ever. In the pre-war years he fought a bitter struggle with the repressive Dutch colonial administration that sent him into exile in hopes of neutralizing his agitation. Despite this opposition, the engineer succeeded in his campaign less than two decades after his graduation from Bandoeng: on the seventeenth of August 1945 Soekarno declared the independence of the Republic of Indonesia, and the next day he was proclaimed the first president of the country.[411]

[407] Moon, *Technology and ethical idealism*, 25-69.
[408] Ravesteijn, *De zegenrijke heeren der wateren*, 270.
[409] Ricklefs, *A history of modern Indonesia*, 205.
[410] Ravesteijn, *De zegenrijke heeren der wateren*, 356.
[411] Ricklefs, *A history of modern Indonesia*, 229.

# Conclusion

William Howard Taft could set his plans to uplift the Filipinos in motion when McKinley appointed him to the post of Governor General of the Philippines on July 4th of 1901. Three months later Queen Wilhelmina delivered her annual speech from the throne, using the occasion to tell her Dutch audience of the moral duty the Netherlands had towards its colonial subjects in the Netherlands Indies. These two events in the summer of 1901 effectively enshrined the recently developed civilizing missions of the two countries as the ideologies driving their colonial policies. These missions to uplift the indigenous populations of the two archipelagoes from the state of primitivism into civilization consisted of two overlapping and intermingling components: a campaign to transform the Filipinos and Indonesians spiritually, and to develop their societies materially.

At the heart of the civilizing missions of the United States and the Netherlands was the conviction that their own societies were superior to those in their tropical territorial possessions. While this sense of superiority had a long past, dating back to Christian religious missionary activity, in the nineteenth century it had come to be buttressed by the industrial transformation that took place in both countries. As it was commonly understood in both American and Dutch society, technology – itself the product of modern science – had provided the path towards the unequaled levels of wealth and prosperity that those living in the industrialized West enjoyed. The material and technological attainments of societies thus emerged as important yardsticks for measuring their degree of development of civilization.

Despite the manifest importance of technology to the Dutch and American civilizing missions, the historiography on the ethical policy and benevolent assimilation has more often than not reserved its attention to the spiritual component. Such accounts of the political tutelage and education of the indigenous population have shown little regard for the ways in which the material component of the civilizing mission went well beyond the immediate need of ending the famine and disease that periodically plagued Filipinos and Indonesians, and thus overlook how the technical artifacts that the colonial governments constructed were also intended to have a civilizing power. It is only in the last two decades that the interest in the agenda of the various imperial powers to materially develop their colonized subjects has been growing. Since then, historians have begun to compare and contrast the civilizing missions of the major imperial powers to draw the similarities and differences between their policies into the open.

This study is the first to make a direct and systematic comparison between the civilizing missions of the Netherlands and the United States in their Southeast Asian colonies. The two countries are in many regards different from what one might call the "Franco-British" mainstream of late nineteenth-century modern expansionist imperialism. The enormous United States, which unlike the European powers had no experience with overseas empire, suddenly came into the possession of the Philippines and several other former Spanish holdings—which made it the youngest imperial power in Asia. The relatively small Netherlands on the other hand was recognized since 1815 as the sovereign holders of a clearly defined territorial area in which the Dutch had been active since the days of their East Indies Company.

Many Dutch and Americans therefore considered their countries to be exceptional in their colonial practices. The Netherlands denied being imperialist, as the country did not appear to join in the aggressive territorial aggrandizement of the British and the French—despite fighting destructive colonial wars when it extended and deepened its rule over the outer reaches of the Netherlands Indies archipelago. The United States positioned itself as benevolent and hence different from the "European" exploitative mode of imperialism. Yet it fought a deadly guerilla war against Filipino nationalists. Furthermore, the British and French Empires took up civilizing missions of their own too, adding an element of moral duty to their colonial rule like the Americans and Dutch.

Upon closer study, the yawning chasm that the Dutch and Americans believed to exist between their own countries and the other European imperial powers is revealed to be less deep and wide. However, this study has shown that the colonial policies of the United States and the Netherlands are unusual, and similar, in the ways they were inflected by a particular subset of the personnel manning their colonial administrations: the engineers of the bureaus of public works.

The influence of the colonial engineers in the two archipelagoes can be traced back to the rise of the politics of social interventionism that arose in the late nineteenth century in the Dutch and American metropoles. The demand for a greater role for government had resulted from the apparent social ills wrought by the rapid changes that followed in the wake of industrialization. The modernity that technology had helped to usher in tore at the fabric of society in the Netherlands and the United States: endemic conflict between capital and labor, city-dwellers living in almost literal cesspools, and a restive underclass created an environment conducive to the creation of a post-laissez faire politics. Reform and regulation

were called for by the young social-liberal movement in the Netherlands and the Progressives in the United States who instated powerful bureaucracies to deal with these excesses.

Due to the complexity of the "social question", the reform politics placed a premium on expertise—and engineers, as men of science believed they were ideally positioned to provide some of that expertise. Their profession had emerged simultaneously in the Netherlands and the United States and had undergone a rapid expansion during and after the last decade of the nineteenth century. Its members believed that their social status and political power still lagged behind the supposed social importance of their work, so they engaged in a campaign to improve their standing in society. The new political atmosphere of respect for expertise in the Netherlands and United States provided them with opportunities they could exploit in this campaign. In order to reap the full benefits afforded by the moment, engineers also played on several socio-political registers. As *men* of *science* they emphasized their male, rational mindset, contrasting it with what they saw as the bias of politicians and feebleness of the female mind.

At the same time, their scientific rhetoric was picked up by politicians who hoped to appropriate the authority that engineering jargon vested in its user. Strikingly, there is a remarkable overlap between the jargon popularized on either side of the Atlantic: *nut*, *rentabiliteit*, and efficiency denote similar moral and economic values. The technical vocabulary – and, more importantly, the social and moral meaning of that vocabulary – of the Dutch and American engineers was therefore closely in tune.

The engineers, and the civil engineers especially, worked to normalize and systematize the material environment of the Netherlands and the United States with their public works. But in addition to their technical plans, the engineers in both countries developed an ideology that stated that members of their profession also had a moral duty: like the systematization and normalization of rivers to prevent them from treading outside their banks, engineers believed that they had an obligation to systematize and normalize society to end its excesses. Moreover, the new emphasis on scientific expertise in the two countries gave rise to the engineers' idea that their profession was uniquely positioned to perform this task. Many of them argued in favor a political system that would give them, on the basis of their "esoteric" scientific knowledge, a mandate to pursue their projects freely without having to contend the meddling influence of others, such as lawyers and corrupt politicians. Their ambition was to instate a technocracy.

I have made extensive use of the technocracy heuristic to analyze the beliefs, objectives, and strategies of the colonial engineers. The concept is relevant because in the

colonial environment conditions were more propitious for the establishment of a system of engineer authority: the absence of democratic institutions and the smaller presence of groups competing for political power gave the engineers more room than in the metropole to flex their professional muscle. In addition, the newly articulated civilizing mission, which stressed the importance of material development, supercharged the engineers' technical authority. In the Netherlands Indies and the Philippines the personnel of the bureaus of public works were in many ways the foot soldiers of the material component of the civilizing missions.

Engineers had a technocratic sensibility in both colonies. They organized themselves into professional organizations, published journals, constantly lobbied the government in an attempt to increase their political power, and made attempts to subvert existing regulations when these stood in the way of their professional interests. Their professional ideology instilled in them the ambition to find ways of working autonomously, free from the meddling of restrictive bureaucracies. Their ambitions led them towards real political power: the staff of the BOW and the BPW had a large influence over the practical implementation of the civilizing mission in the Netherlands Indies and the Philippines. Within the context of the civilizing missions, technologies were defined under their direction as particularly "ethical", such as the irrigation works in the Dutch colony, or especially "civilizing", such as the roads in the American colony. The large budgets of the two bureaus allowed their personnel to intervene sharply in the everyday lives of the colonial subjects, providing them with clean water, paved roads, irrigated fields, and a host of other technical artifacts that had large consequences for the social conditions in the archipelagoes.

To achieve these results the engineers had to overcome the challenges of the tropical climate and the unfamiliar social and geographical environment of the two island chains. Although these differences between the colonies and the metropoles often acted as impediments to achieving the technical objectives of the engineers, the challenges were in some ways a boon to their technocratic agenda as it gave them opportunities to leverage the professional identity formation process they had practiced at home. For example, because it was believed that the climate and society of the Philippines and the Netherlands Indies possessed an inherent dangerous "tropicality" that threatened to corrupt weaker minds, the idea emerged that the colonial government needed above-average men to withstand this menace. In the Netherlands and the United States engineers had long worked to fashion themselves as members of an occupation who were exemplified by their trustworthiness. Their strength of "character" therefore supposedly allowed them to withstand the tropical corruption that would have claimed other, less strong-minded men.

Race and gender issues are highly relevant towards understanding the identity formation process of the Dutch and American colonial engineers. In terms of gender, it is clear that the engineers belonged to an almost exclusively male occupation that often defined itself as a brotherhood, and worked to exclude women. At an individual level – and this is especially true for the Americans – they projected an image of themselves as masculine pioneers who brought order where there had been chaos—or, who brought civilization where there had been savagery. In the charged political atmosphere of expansionist imperialism, the engineers leveraged their image as paragons of scientific prowess and male gender power to make a persuasive claim to authority in the colonial arena.

The bonds of brotherhood could cross the boundaries of nations, as many Dutch engineers who visited the United States felt it did. But fraternity created exclusionary processes too: at the BOW in Weltevreden attempts were made to block the appointment of foreign engineers. Rather than being the result of a nationalist ideology, though, the cause for this behavior was the extra identity layer the Dutch engineers possessed as graduates of a single educational institution: Delft. This leads to the conclusion that the colonial engineers in the Netherlands Indies created something akin to a guild. This stands in clear contrast to the more open atmosphere at the BPW in Manila, where many foreign (Western) nationals were recruited and even promoted to high positions.

The race of the colonial engineers was also a significant determinant of their policies, because the Americans and Dutch felt that their whiteness very clearly set them apart from the colonized peoples they ruled. But while the ethnographic barriers of the engineering profession in the Netherlands Indies were practically insurmountable in the first two decades of the twentieth century, those in the Philippines were positively porous. The *pensionado* system sent many Filipinos abroad to receive a university education and some took up classes in engineering. Most notably among them is José Paez, who became the first Filipino director of the BPW. Such a promotion was almost inconceivable in the Netherlands Indies, and the hardening of the colonial society's racial stratification in the decades that followed 1920 made it only more unlikely to ever occur; and indeed, the BOW directors would continue to be white men until the end of Dutch colonial rule. Furthermore, the opening of universities in the Philippines in the latter part of the first decade of the century allowed aspiring engineers from the indigenous population to follow the curriculum without having to travel abroad, and they began taking up positions with the BPW in significant numbers as early as the first years of the second decade of American rule.

In other words, there were very real differences between the willingness of American and Dutch colonial engineers to have Filipinos and Indonesians become participants in their civilizing project during the 1900-1920 period surveyed in this study. Only once the *Technische Hoogeschool* was opened in Bandoeng in 1920 could Indonesians learn what the Dutch had been teaching at Delft for so many years already. Still, the degrees they obtained there were not enough for them to be allowed into the professional brotherhood of engineers working in their archipelago. The distance between the Dutch and their colonial subjects was simply unbridgeable, even when the two groups were intellectually matched. American engineers on the other hand took benevolent assimilation's tutelary mission to heart and made the training of indigenous personnel an integral part of their day-to-day work and entered into much closer relations with the Filipinos. The propaganda strategies used by either Bureau further underline these findings. The *Quarterly Bulletin* emphatically directed itself towards Filipinos, and the BPW distributed pamphlets and participated in the spectacle of the Philippine Carnival to gain the coveted "good will" of the indigenous population. By contrast, the Dutch were content to celebrate the opening of their public works within their own, "white" circle.

The tendency of the Americans to take their relations with the Filipinos very seriously were already clearly present in the years before the election of President Wilson, when the appointment of Governor General Harrison led to the acceleration of Filipinization. At a time when the Dutch personnel of the BOW continued to fret about the appointment of foreigners to their Delft bastion, dozens and dozens of Filipinos entered into the ranks of the BPW—a development that would speed up even further when the United States entered into the First World War and many of the Bureau's personnel were called into military service.

These findings underline the relevance of the engineering cultures concept. Like many other professions, engineering creates distinct ideologies – that, for example, operate within the boundaries of a specific nation – that carry over into the everyday practices and outlooks of its members. This study has first shown how aspects such as brotherhood and the self-fashioning processes that were part of the ideology of the American and Dutch metropolitan engineering cultures were surprisingly closely in sync. In what followed it was revealed how these cultures made their way to the colony and subsequently diverged, be it due to pressures of competition with other government departments or the opportunities afforded by enthusiastic and supportive administrators.

While the technocracy heuristic offers a window through which to analyze the colonial engineers in the Philippines and the Netherlands Indies, it does not describe the outcomes of

their works. Even in the 1900-1920 period, which was the high point of the colonial BPW and BOW, the personnel of the two Bureaus could not wrest themselves free from the bureaucracies they were part of to attain full autonomy. The Americans arguably enjoyed their high tide during the four years that Cameron Forbes was Governor General from 1909; the Dutch had their golden years between 1913 and 1920, when their wages were high, their colleagues were appointed to the office of mayor in several large cities, and funding for large-scale irrigation was forthcoming. To the members of the profession an era of great political power often appeared to be dawning just behind the horizon; but the sun would never rise on a colonial technocracy run by engineers. To the determined technocrats among them this must have been a disappointing outcome.

Still, even the technocrats might have been happy to resign themselves to what they left behind in the Netherlands Indies and Philippines. Although they styled themselves as missionaries of modernity, many of the engineers revealed an interest in the past. They admired the works built by Babylon, Sumeria, Rome, Carthage, and Egypt, and hoped to one day leave behind artifacts on a par with those constructed by these civilizations. From a technical point of view, they may have worked to bring permanent improvement with their designs; but at the same time they personally hoped to build monuments to their own ingenuity, and immortalize themselves in the process. Going by Halsema's epitaph – "Baguio is his monument" – some amongst them have succeeded.

# Summary

This study compares the role played by Dutch and American engineers in the colonial governments of the Netherlands Indies and the American-controlled Philippines in the 1900-1920 timeframe. It contends that these colonial engineers extensively influenced the practical implementation of the civilizing missions of that were formulated in the United States and the Netherlands around 1900. Through the use of a systematic comparison between the activities of the engineers in these two Western countries and their tropical colonies the unique aspects of the American policy of "benevolent assimilation" and the Dutch "ethical policy" will be drawn into focus.

This study makes use of the technocracy heuristic to analyze the behavior and ambitions of the engineers. Technocracy in this case refers to rule by experts, a goal that many members of the engineering profession that had emerged in both countries in the 1890s strove for. Such a political system could not be implemented in the Dutch and American metropoles, but in the colonies the engineers faced fewer obstacles to their political agenda. The technocratic ambitions of the engineers are reconstructed here by analyzing the rhetoric they used and the discourses they drew upon in their journals.

In the first part of this study the emergence of the engineering profession in the Netherlands Indies and the United States is compared. The rhetoric of the engineers on either side of the Atlantic evinces important similarities, as does the receptiveness of politicians and public to their ideas. The new mode of imperialism and the civilizing missions that either country articulated concurrently also bear close resemblance.

A series of vignettes in the second part of this study describing the practices and ideology of the colonial engineers working in the Netherlands Indies and the Philippines reveals how the meanings of the technologies they used were socially constructed. They show that the Americans possessed a unique willingness to have the Filipinos participate in their developmental strategy, whereas the Dutch did not cross the ethnographic separation from the Indonesians. This finding to an extent confirms the "exceptionalism" of American empire in this period.

# Appendix

## A. Cast of characters[412]

**William McKinley** (1843-1901). Twenty-fifth President of the United States. Under his administration the Spanish-American war was fought victoriously, ending with the fateful decision to annex the Spanish overseas possession, including the Philippine Islands. He was assassinated by the anarchist Leon Czolgosz in Buffalo, NY.

**Theodore Roosevelt** (1858-1919). Assistant Secretary of the Navy from April 1897 until May 1898. Served as Governor of the State of New York for the two years of 1899 and 1900 and was selected as Vice President to William McKinley. Upon McKinley's death he became President and successfully won a second term.

**William Howard Taft** (1857-1930). Member of the Second Philippine Commission and the first civil Governor-General of the Philippines from July 1901 until December 1903. He was Secretary of War during the second administration of President Theodore Roosevelt, and was the latter's successor in the White House for a single term ending in 1913.

**William Cameron Forbes** (1870-1959). Secretary of Commerce and Police in the Philippine Commission from 1904 until 1908, and thereafter Governor-General of the Philippines until 1913. He was a strong supporter of public works construction.

[412] Most of these biographical details are in the public domain or have already been sourced in the narrative above. Any additional information (especially for the slightly more obscure Dutch characters) has been drawn from the records of the *Internationaal Instituut voor Sociale Geschiedenis* ("International Institute for Social History", www.iisg.nl), and the *Biografisch Woordenboek van Nederland* ("Biographical Encyclopedia of the Netherlands", www.historici.nl/Onderzoek/Projecten/BWN), and *Parlement & Politiek* ("Parliament & Politics", www.parlement.com).

**James Wallace Beardsley** (1848-1934). Chief consulting engineer for the Philippine Commission and first director of the Bureau of Public Works in Manila from 1905 until 1908, where he struggled to staff the new office. He was eased out of his position and appointed consulting irrigation engineer and tasked with compiling a report on the techniques in use in several European colonies including Java.

**Eusebio Julius Halsema** (1882-1945). Sailed to the Philippines as engineer of the Bureau of Public Works from 1908, becoming mayor of the American summer capital of Baguio in 1919 until retiring in 1935. He improved the public infrastructure during his tenure and built the road to Bontoc, today still known as the Halsema Highway.

**José N. Paez** (1888-?). Brilliant student of civil engineering who attended university in Europe at his own expense before coming as *pensionado* to Cornell University in Ithaca, New York. He obtained a Master of Science degree in civil engineering in 1913, the first Filipino to do so. After a rapid rise in the BPW's professional hierarchy he became the Bureau's first Filipino director in 1919. He left the post in 1924 when he became the general manager of the Manila North Railroad, a position he would keep until the outbreak of World War II.

**Alexander Willem Frederik Idenburg** (1861-1935). Politician of the confessional Anti-Revolutionary Party who was highly influential in colonial politics and supported the political emancipation of the Indonesians. He was elected to the Dutch lower house of Parliament in 1901 and served as Minister of Colonies thrice in the two decades that followed: 1902-1905, 1908-1909, and 1918-1919. Between his second and third ministerial office he took up the post of Governor General of the Netherlands Indies from 1909 until 1916.

**Rudolf Adriaan Van Sandick** (1855-1933). Politically active and prominent member of the Dutch engineering community and proponent of a progressive engineering ideology. He studied at the Polytechnische school in Delft from 1872 until 1878, served on the senate of the Student Corps and participated in the activities of the left-leaning Debating-club and the "Vrije Studie" ("Liberal Study") society. Worked for the *waterstaat* in the Netherlands Indies between 1879 and 1884 and served on the editorial board of the *Indische Gids* (1896-1902) and rose to level of chief editor. He stepped down after he took up the same post for *De Ingenieur* in 1900, a position he would keep until 1932.

**Pieter Brooshooft** (1854-1924). Ethical thinker and the editor of *De Locomotief*, the periodical based in Semarang, between 1887-1895 and a second time after 1901. In its pages he delivered strong critiques of the extractive policy of the Dutch in their colony, and argued that the Netherlands had an "Eereschuld" or "debt of honor" to fulfill towards the Indonesians. He demanded that an ethical policy be implemented in a 1901 pamphlet.

**Conrad Theodor van Deventer** (1857-1915). Friend of Brooshooft and popularized the "Eereschuld" with his 1899 article of the same name. He provided the motto for the ethical policy: irrigation, education, and emigration. From 1905 until his death Van Deventer served in both chambers of the Dutch parliament as an Indies Specialist or colonial expert.

**A.G. Lamminga**. Designer and builder of several high-profile irrigation projects in the Netherlands Indies, including those at Pemali on Java. He was appointed professor of irrigation studies at the Technische Hoogeschool in Delft. He was a consistent supporter of a different approach to calculating the value of improved irrigation in the Netherlands Indies in an attempt to break the opposition of the BB in the *rentabiliteitscommissie*.

**Henri Hubert van Kol (**1852-1925). Indies Specialist in both chambers of Dutch parliament between 1897 and 1924 for the SDAP (Labor Party) that he helped found. A graduate of Delft, Van Kol developed his socialist ideas there, and spent close to two decades in the Netherlands Indies working as an irrigation engineer between 1876 and 1895. Simultaneously a critic of imperialism and a supporter of colonialism, he argued that the Dutch had a moral duty to uplift the population of its colony, using technology to lift the bane of primitivism and bring prosperity to the islands.

**J.E. de Meyier** (1848-1913). Irrigation engineer and director of the *Bureau Openbare Werken* from 1898 until 1901. He developed into a staunch opponent of the irrigation project in the Solo valley on Java. After leaving his post he took over's editorship of the *Indische Gids*. He visited the International Engineering Congress held by the ASCE in Saint Louis in 1904 to deliver a presentation on Dutch irrigation practices on Java.

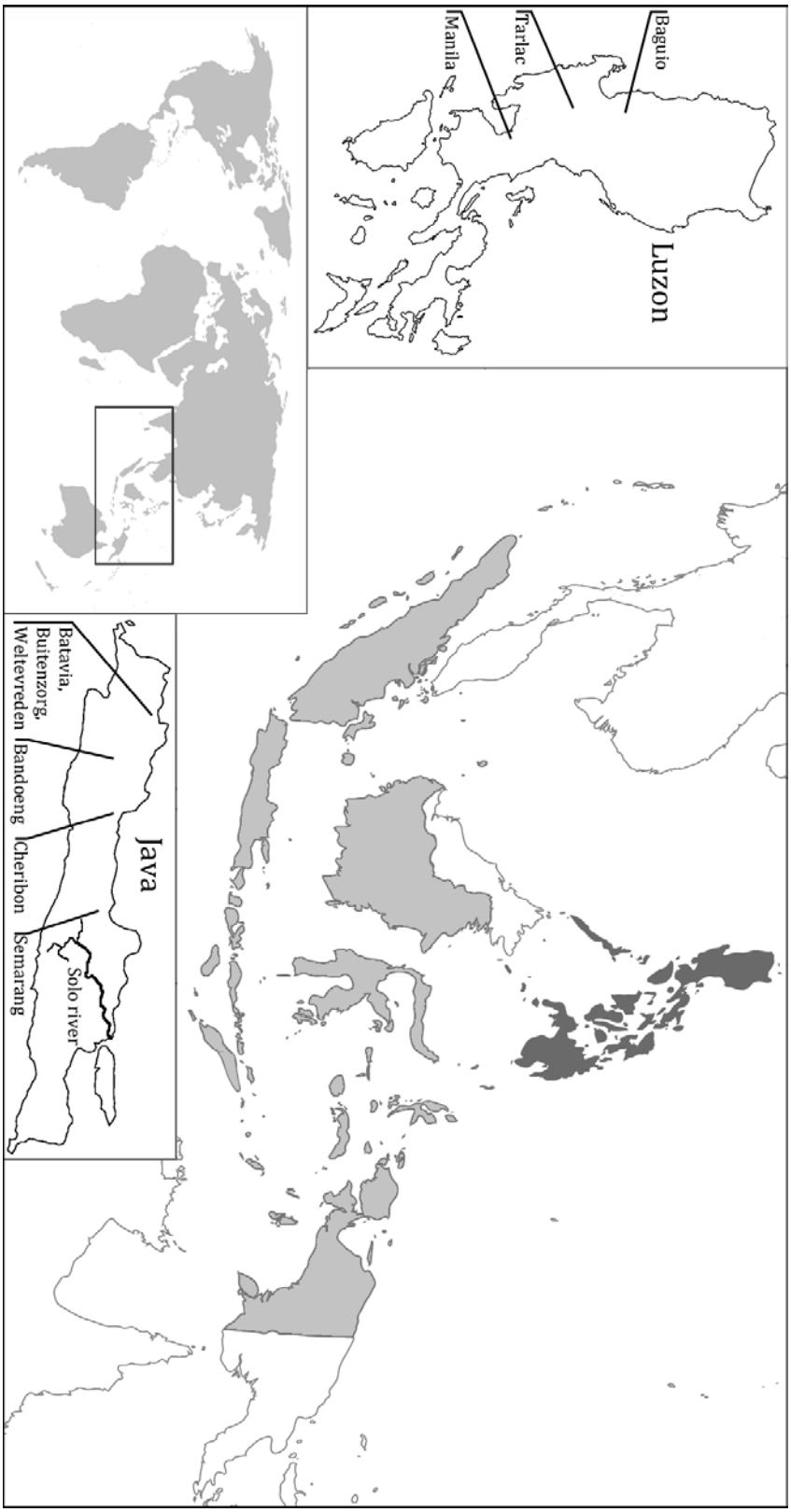
**Charles G. Cramer** (1879-1975). Rose to the position of chief irrigation engineer during his employment at the *Bureau Openbare Werken* between 1904 and 1923. He was the secretary of the *Vereeniging van Waterstaats-ingenieurs* in the Netherlands Indies that published *De waterstaats-ingenieur* from 1913 onwards. He acted as the society's representative during his time in the Netherlands ca. 1914. Served in both the upper and lower house of Dutch parliament between 1923 and 1937 for the SDAP (Labor Party).

## B. Directors of public works in the Netherlands Indies and the Philippines, 1900-1920

| *Bureau Openbare Werken*, Weltevreden[413] | | Bureau of Public Works, Manila[414] | |
|---|---|---|---|
| J.E. de Meyier | 1898-1901 | James Wallace Beardsley | 1905-1908 |
| H.P. Mensinga | 1901-1905 | James F. Case | 1908-1909 |
| A.P. Melchior | 1905-1908 | Warwick Greene | 1909- 1916 |
| W.B. van Goor | 1908-1911 | E.J. Westerhouse | 1916-1919 |
| J. Homan van der Heide | 1911-1914 | José Paez | 1919-1924 |
| P.J. Ott de Vries | 1914-1920 | | |

[413] Ravesteijn, *De zegenrijke heeren der wateren*, 366.
[414] Halsema, *E. J. Halsema, colonial engineer*, 31, 49-50, 127; Olivia C. Caoili, *A history of science and technology in the Philippines*, Analysis of Conditions for National Scientific and Technological Self-Reliance: The Philippine Situation (Quezon City: University of the Philippines, 1986), 25.

## C. Sites of interest



## Sources

For this study I have made use of primary sources made available at locations in the Netherlands and the United States. The internal communications of the American administration of the Philippines were found in the records of the Bureau of Insular Affairs kept at the National Archives at College Park, Maryland. The books and pamphlets relating to the engineering profession in the Netherlands Indies were found at the *Koninklijk Instituut voor Taal-, Land- en Volkenkunde* (KITLV; "Royal Netherlands Institute of Southeast Asian and Caribbean Studies") in Leiden.

I make extensive use of the publications of the engineering societies set up by the Dutch and American engineers in both countries and, in the case of the Netherlands Indies, in the colony. The annual reports by the directors of the *Bureau Openbare Werken* in Weltevreden and the Bureau of Public Works in Manila, as well as the Philippine Commission Reports to the Secretary of War in Washington, D.C. have also been consulted. The BPW's *Quarterly Bulletin* is positioned in between these official memorandums and the publications of the engineering societies: as an effort to engage in what is now known as 'public relations', it was published by a professional organization of engineers rather than a voluntary association. I studied these periodicals at the National Archives in Washington D.C (NA); the library of Yale University (YU); the Science, Industry and Business Library in New York City (SIBL); the Library Annex of Rutgers University on Busch Campus (RU); the Royal Library in The Hague (KB); the library of Leiden University (LU); and the digitized collections of Google Books (GB). The details of these publications are listed below.

*De waterstaats-ingenieur: orgaan der Vereeniging van Waterstaats-ingenieurs in Nederlandsch-Oost-Indië*. Published every two months in Soerabaia by the Vereeniging van Waterstaats-ingenieurs in Nederlandsch-Oost-Indië between March 1913 and January 1916, thereafter published monthly. (LU)

*De ingenieur: orgaan der Vereeniging van Burgerlijke Ingenieurs : weekblad gewijd aan de techniek en de economie van openbare werken en nijverheid*. Founded in 1886 and published weekly by the Vereeniging van Delftsche/Burgerlijke Ingenieurs, from 1900 onwards in collaboration with the Koninklijk Instituut van Ingenieurs. (LU)

*Tijdschrift van het Koninklijk Instituut van Ingenieurs, Afdeeling Nederlandsch-Indië. Notulen der vergaderingen, verhandelingen, vertalingen, verscheidenheden, verslagen*.

Published once a year between 1875 and 1914 by the KIvI engineers working in the Netherlands Indies, and contains the transcripts of their meetings alongside articles submitted by its members. (KB)

*De Indische Gids: staat- en letterkundig maandschrift*. Monthly on economic, political, and literary issues pertaining to the colony. Published in Amsterdam from 1879 until 1941.

*Report of the Philippine Commission to the Secretary of War*. These reports were compiled on an annual basis between 1900 and 1916 by the offices of the government of the Philippines, and printed by the Government Printing Office of the United States. (GB)

*Quarterly Bulletin of the Bureau of Public Works Manila*. First published on April 1st 1912, this quarterly magazine was published under the direction of the Chief Engineer and the Director of the BPW until 1920, with a two issue interruption in the second half of 1919. (NA/SIBL/YU)

*Transactions of the American Society of Civil Engineers*. Published in New York by the ASCE, the *Transactions* are compiled annually and contain items such as the addresses of the Society's presidents at the yearly conventions and papers related to the engineering practice submitted by its members. (RU)

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