Andrew Goss. *The Floracrats: State Sponsored Science and the Failure of Enlightenment in Indonesia.* Madison, WI: The University of Wisconsin Press, 2011 (series: New Perspectives in Southeast Asian Studies). 256+ pp.

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Andrew Goss's *The Floracrats* is a well-written and innovative analysis of the historical development of biological research in the Netherlands East Indies and Indonesia since the nineteenth century. Goss's leading question is why, against the backdrop of the natural richness and diversity of the archipelago, have colonial and postcolonial natural scientists achieved so little? And, particularly, why do Indonesian scientists perform so poorly relative to their international peers?

Right from the beginning and throughout the book, the central message is clearly stated: scientific research was subordinated to the interests of the colonial state. As a consequence, there was no independent scientific community that was firmly anchored in civil society. Goss's conclusion is big and sounds like an indictment: "it is the failure of the Enlightenment that is the key to understanding the history of science and the politics of knowledge in modern Indonesia" (p. ix).

In seven well-documented chapters, Goss elaborates on his grand thesis by focusing on key figures and their impact on scientific activities in the colony. In the first chapter, he describes how Enlightenment—defined as "the dispassionate, free, and useful inquiry into the workings of nature" (p. ix)—arrived in the colony in the mid-nineteenth century. Science-minded people like P. Bleeker, W. F. van Hoevëll, and F. Junghuhn had the idea that, by investigating the geography, people, and nature of the colony, their findings could advance colonial society. Goss calls them "apostles of Enlightenment" (Chapter 1).

The knowledge of nature developed slowly from the activities of naturalists—e.g., collecting, describing, and classifying nature—to becoming a laboratory-based discipline of biology—e.g., researching questions about function, morphology, and evolution—but, in the context of the colony, the naturalist tradition remained strong. A good example of the naturalist mode of research was the exhibition organized in 1853 in Batavia, which was modeled after the Great Exhibition in London two years before, where the natural richness of the archipelago was on display. Funded by the government and including many contributions from interested people throughout the colony, the exhibition was a success. After a brief moment of euphoria, the "apostles" soon discovered that their dreams did not come true. It turned out that, within colonial society, there was neither interest in, nor support for, research-based social improvements. Because scientific research did not take root in civil society and the apostles failed to establish themselves as leaders of civil society, the only possible way to conduct scientific research was under protection of the colonial state.

In chapter two, Goss describes the efforts of Franz Junghuhn to develop and produce quinine in Java. Because malaria was one of the main adversaries of colonial expansion in the nineteenth century, the acclimatization of cinchona trees in Java was of crucial importance. Junghuhn became the first "floracrat": a biologist in the service of the state. However, despite being under the sponsorship of the governor general, Junghuhn's efforts failed, and it took several more decades before the Netherlands

Indies managed to produce its own quinine. It remains to be seen to what extent Junghuhn's stubborn nature or the protective role of the state caused his initial failures. It was K. W. van Gorkum who eventually succeeded in growing productive cinchona trees on a commercial basis. In doing so, van Gorkum made successful connections between science, colonial policy, and business interests, and demonstrated that a floracrat could also become a successful technocrat.

Chapters three and four focus on another famous floracrat, Melchior Treub. He transformed the botanical garden in Bogor from being the governor general's pleasure garden to an international center for research. He did so mainly by developing a good infrastructure for research, launching journals and publishing findings, and inviting foreign researchers to participate as guests. As a result, the botanical garden earned international esteem under his directorship. Later, in 1905, Treub became director of the newly formed Department of Agriculture. In this position, Treub controlled dozens of agricultural institutes, most of which were confined to applied research serving colonial interests. Goss seems to suggest that Treub was better at producing a favorable reputation than actual innovative scientific results.

The beginning of the twentieth century saw the rise of a new group of indigenous "apostles of Enlightenment," centered on students of the Dutch medical school STOVIA (School tot Opleiding van Inlandsche Artsen, School for the Training of Native Physicians in Batavia) and an organization for Javanese-educated elite, Boedi Oetomo (Beautiful Endeavor). Chapter five follows the efforts of these apostles to improve society through science. Like their Dutch predecessors, they also failed to spark popular Enlightenment (p. 97) and to raise popular support for a science-based program of improving society. Goss differentiates here three groups of nationalists: (1) official scientific nationalists, those who linked their professional future to the Dutch colonial regime; (2) cosmopolitan nationalists, like G. S. S. Ratoe Langie, who were convinced that progress and modernity could be achieved by cooperation with the Dutch; and (3) popular nationalists led by Sukarno, who in the 1920s raised mass support and marginalized the other groups.

In the early 1930s, the Department of Agriculture, Industry, and Trade was reorganized as the Department of Economic Affairs, and an economist replaced a biologist as its director. Chapter six highlights the efforts of the new director, H. J. van Mook, to centralize a new science-driven technocratic policy. In this context, van Mook revived the leading role of the botanical gardens as a center of research. However, the global economic depression and, later, the Japanese invasion brought an untimely end to his ambitions.

The final chapter reviews all too briefly developments in the postcolonial period and concludes that Indonesia's science policy has not managed to free itself from the colonial straightjacket. Scientists (both colonial and postcolonial) were essentially state bureaucrats and operated at a great distance from society, and were thus unable to play a leading role in improving civil society. Once more, Enlightenment failed to make the difference.

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For Goss, "Enlightenment" can only succeed when science is rooted in a civil society where scientists are allowed to play a leading role. But in the case of the Dutch

East Indies and Indonesia, the state encapsulated and controlled science and made it subordinate to its own interests. Was I surprised to read that most scientific institutions, funding, and research activities served the interests of the colonial state? Not really. I would have been very surprised if it had been otherwise.

I very much appreciate the meticulous research done by Goss in this large, but neglected, field of historical research. However, I do have a problem with his repetitive statement about the "failure of Enlightenment," which explains the conditions under which colonial scientists had to work. It seems to me that Goss's opinion is an ideologically informed and normative point of view that is not necessarily the best avenue towards a better understanding of what actually happened. An emphasis on failure does not necessarily help to explain how things actually did work. In addition, more attention should have been paid to the strained relationships between the colonial government and big colonial agribusinesses. In this respect, Goss is also a bit too dismissive about van Doorn's analysis of the Netherlands Indies as a colonial technocracy.[1] Goss only refers to van Doorn's statement that this technocracy was unfinished, but seems to ignore his wider claim that the late colonial state was in many respects a technocratic project, which cannot be separated from developments in the Netherlands at that time.[2]

Finally, the term "civil society" is used in a very unproblematic way. I have no idea what civil society looked like in Java in the nineteenth century. Who was part of it? Moreover, how should we understand civil society in a constantly changing colonial setting?

Goss has made a major contribution to a field that is still understudied. If we want to understand how colonialism worked in a much broader sense than the narrow field of "politics," we need many more in-depth studies like this book, for instance, on medical history. Moreover, much more work has to be done to understand how engineers, medical experts, and natural scientists, as well as applied sociologists and juridical experts, were all part of a conglomerate of "projects" in the Dutch East Indies that pushed the colony forward towards its postcolonial condition.

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[1] J. A. A. van Doorn, *De laatste eeuw van Indië. Ontwikkeling en ondergang van een koloniaal project* (Amsterdam: Bert Bakker, 1994), p. 164.

[2] For a brilliant exploration of the way engineers at the turn of the twentieth century not only modernized Dutch infrastructure but also introduced a new language that enabled them to talk about progress and development, see Auke van der Woud, *Een nieuwe wereld. Het ontstaan van het moderne Nederland* (Amsterdam: Bert Bakker, 2006).