

# COLONIAL CARTOGRAPHY OF THE NETHERLANDS EAST INDIES 1816-1942

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## ABSTRACT

Far from the straightjacket of the mother country, Dutch colonial cartography, often hampered by lack of funding, material and standing personnel, subject to high mortality rates, was able to develop its own style in a creative and innovative way. On World Exhibitions from the 1870s to 1910 the Dutch colonial mapping material was awarded high distinctions; when the *Atlas van Tropisch Nederland* was published in 1938 in Batavia, just in time for the IGU conference in Amsterdam, it could be regarded as the first national atlas of a tropical country (Indonesia), published 30 years prior to its counterpart for the Netherlands.

The Topografische Dienst van Nederlands Indië (Netherlands Indies Topographic Survey), founded in 1864, later to become the largest printing establishment in Southeast Asia, never had more than 400 staff (European and Indonesian staff combined) and was responsible for surveying 2 million km<sup>2</sup> of dense jungle. The army topographic school in Malang catered for the training of the personnel; surveying parties were largely native in composition, as were the cartographers. Apart from the land survey, the Dutch navy produced some 350 charts of the area, starting in 1806 under Governor Daendels. Geological mapping, soil mapping, irrigation infrastructure mapping, forest maps and mining maps were produced by other ministries. A commercial cartographic section had developed as well, producing school atlas and other educational material, as well as road atlases.

Far from the mother country, it was easier to experiment with new ways of representation. Moreover, the flat and small mother country did not prepare for the mountainous and vast area where other mapping techniques were called for and developed. Photogrammetry developed early here, and there was much experimenting with contour lines, hill shading and layer tinting according to the various German, Swiss and Austrian schools. The 20<sup>th</sup> century land use representation developed in the Netherlands East Indies is completely original, adapted to the mountainous terrain, in combination with hill shading and contour lines. It succeeded a much more taxonomically detailed 19<sup>th</sup> century land use representation, combined with hill shading only.

As education in Malayan, Javanese and Bahasa Indonesia languages developed, chart and atlas editions in these languages developed as well. Toponymy was largely indigenous; the official gazetteers also had indigenous versions of the few Dutch names that had been given (for instance Betawi next to Batavia and Bogor next to Buitenzorg). The major name changes after decolonization were therefore easy, and consisted mostly of substituting the letter –u- for the Dutch –oe- letter combination, with the same sound, changing for instance Soenda into Sunda.

## INTRODUCTION

I would like to subdivide the mapping of the Netherlands East Indies into five phases; the first two, in-between the first contacts (1597) and the Napoleonic Wars, the period of the Dutch trading Empire of the United East India Company (VOC), and the one between the Napoleonic wars and 1864 are characterized by hydrographic charting; from 1790 onwards on a scientific level. There was some compilatory work, as by Valentijn (see the island maps in his *Oud en Nieuw Oost-Indiën*, 1724-26, figure 1), but based on charts without many astronomical observations. What the terrestrial surveys up to 1850 proved was merely the lack of these observations and their unsystematic character.

In 1864 the Topographic Survey was initiated, directly under the General Staff, and this meant putting the systematic survey started in 1850 on a secure basis. The systematic mapping of Java took from 1850-1880, and then the mapping of the outer islands was started, For the outer islands this phase lasted until 1940. The increased attention for all aspects of the colony caused a proliferation of mapping operations, until these were regulated in 1905, when the Central Mapping Committee was set up in order to coordinate all official mapping operations in the archipelago. For Java and Sumatra this meant a fourth phase of mapping translated into the emergence of thematic mapping; this period up till World War II was also characterized by a high technical level of mapping operations and the early introduction of photogrammetry; the last phase was the production of the first national atlas of a tropical country by 1938.



Figure 1 – The isle of Java, from Valentijn (1726)

## THE PERIOD PRIOR TO 1816

In 1816 when, after the Napoleonic wars, Dutch authority in the Archipelago was restored, about a third of the isle of Java was under direct control of the Dutch, and there were some tiny pockets of direct rule in the Moluccas and on Sumatra. The rest of the archipelago was at the most under nominal authority of the Dutch, for some areas, like Bali, direct Dutch authority was only effectuated in 1906. The 19<sup>th</sup> century was the time when the trading empire of the Dutch East India Company (VOC) was converted into a colonial empire of the Netherlands.

Charts had been produced for the trading empire since 1600, in increasing detail and accuracy. And there had been some systematic charting, as can be seen in the Atlas Izaak de Graaf, an inventory of the trading area from Cape Good Hope to Japan produced for the VOC management in 1692. The managers used this atlas right up to 1800. We are now working on a facsimile edition of this atlas. After a false start in 1743 in Batavia, where it did not thrive, in 1782 a hydrographical academy was set up in Semarang on Java, where it flourished until the British Governor Raffles closed it in 1812 during the British interregnum.

Since 1798, when the Netherlands government had taken over from the Dutch East India Company, mapping had accelerated. Now that the mother country had become a French protectorate, a direct threat of British invasion was perceived and all kinds of infrastructural works were initiated to counter that threat, such as the building of fortifications and of the grand trunk road from one end of Java to the other by governor Daendels. The resulting map material was used later by British and Dutch topographers to compile the map of Java (figure 2) which is also part of Raffles' *History of Java* published 1817. Another map of the islands was published in Crawford 's *History of the Indian Archipelago* in 1820.

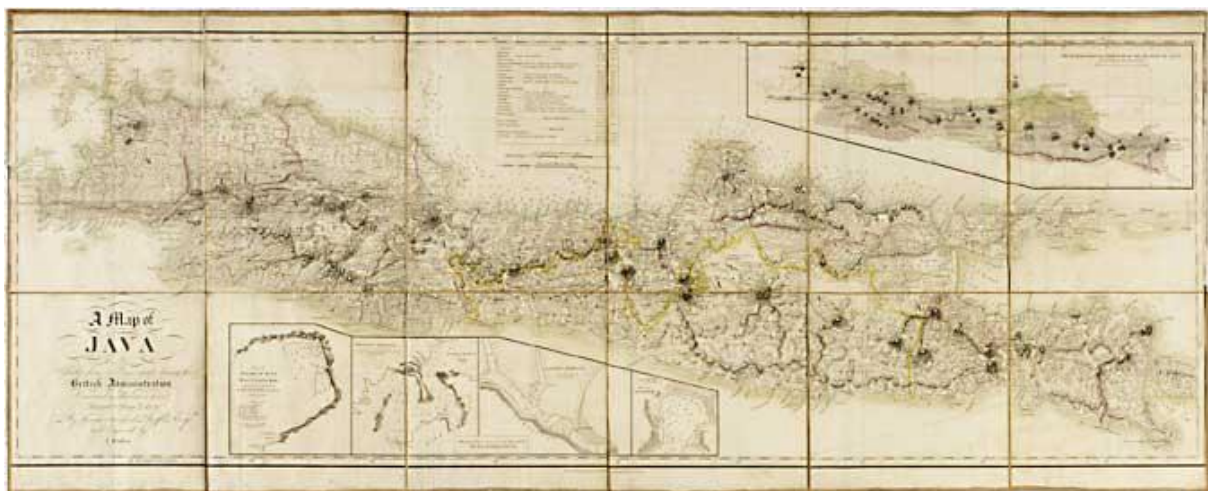


Figure 2 - A map of Java, inserted in Raffles' *History of Java*, London 1817

## 1816-1864: VON DERFELDEN AND MELVILL VAN CARNBEE

By that time the Dutch, a year after authority had been transferred back to them, had produced their own first post-Napoleonic wars atlas of their colonies (Van den Bosch - *Atlas der Overzeesche bezittingen*, 1817), but as this material neither had the required quality nor the required scale, King William the First commissioned Baron Von Derfelden van Hinderstein to produce a new map of his eastern possessions, at the scale 1: 2.270 000, which was published in 8 sheets in 1839-1855 (*Algemeene kaart van Nederlandsch Oostindie*, see figure 3). This is the first map that was based on extensive scientific compilation work, and the *Mémoire analytique* (1844) that was produced for this map, discussing all the map sources and their discrepancies is almost more important than the map itself. One of the sources was Philippe Vandermaelen's World map series 1:1,6 million, published in 1827, on which Von Derfelden substantially

improved. In the course of a PhD research on Von Derfelden, all his compilation maps were retrieved from the Collection Roland Bonaparte in the Bibliothèque Nationale in Paris, which gives us a good insight in the actual compilation process. Von Derfelden's map was followed in 1853-1862 by an atlas produced by the hydrographer Melvill van Carnbee and the topographer W.F. Versteeg (*Algemeene Atlas van Nederlandsch Indië*, who was to be the first director of the topographic survey from 1864 onwards. As both were working in the East, their access to the material was much better than that of Von Derfelden, and the atlas consequently had a much better press when published in 1854. The best inventory of all mapping endeavours, accelerated by the Diponegoro uprising on Java and the ensuing Java War which made the need for detailed topographic maps obvious, is given by Seyff (1856). We find it rather unfortunate that no index sheets with Dutch mapping endeavors in the Indies prior to 1850 when the systematic mapping started, are available.

Still, Von Derfelden's map was important because it provided a detailed document to add to, to improve on, and the *Mémoire analytique* invited that as well. The map is mainly based on hydrographical surveys, and these surveys are the main characteristic of the period until the second half of the 19<sup>th</sup> century; as no systematic topographic mapping occurred before that date.



Figure 3 Part of the west coast of Sumatra from Von Derfelden's *Algemeene kaart van Nederlandsch Oostindië*, 1839, scale 1:2 270 000.

### 1864-1905 VERSTEEG TO ENTHOVEN

In 1864 the Topographic Survey was founded as an independent department under the general staff, after the systematic mapping and the triangulation of Java had proceeded since 1850, as part of the Army corps of engineers. The mapping, at a scale of 1:10 000 with final publication scale 1:100 000, was organised per administrative unit, called residency; Java was subdivided into 23 of them. These 'residentiekaarten' contained the administrative and military infrastructure, rivers, mountains and settlements, post- or resting stations, and also a very detailed rendering of land-use (see figure 4): the map discerned in-between coffee, bamboo, three types of forest, wet and dry (rice) agriculture, and marsh areas. There were 5 types of roads, and 7 types of administrative seats. The first director, Major W.F. Versteeg, laid the foundations for the working procedures and formulated instructions for the surveyors.

It was only in 1870 when the non-intervention policy regarding the outer islands ceased, and the drive was started to bring them under direct rule. And this meant mapping them as well. So in 1880, when the survey of Java had been completed, the mapping brigades went overseas. Triangulation was possible in mountainous parts like Western Sumatra and Celebes, but not so in Eastern Sumatra and most of Borneo where the wide rivers described by Joseph Conrad sweep even wider alluvial plains heavily covered with tropical jungle. The positioning procedure here was to take

astronomical observations, and to compute longitude on the basis of precision clocks taken upriver. When later in the 1920s in New Guinea similar water-borne surveys were held the topographers were able to use radio time signals for location purposes. The residency maps, because of their advanced reproduction method devised in the Netherlands (sequential etching made it possible to print in different tones or shades of the same colour from one lithographic stone), won a number of gold medals at World Exhibitions from 1870-1910.

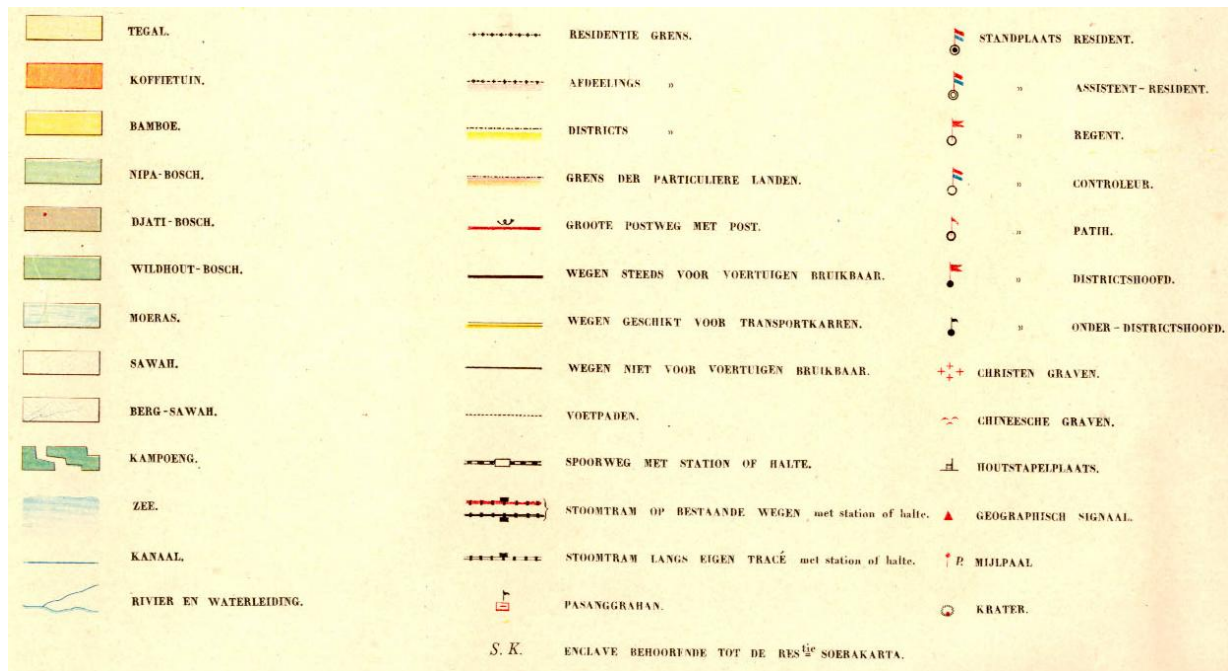


Figure 4 – Legend of the 1:100 000 residency maps, with extensive land-use coverage

## 1905-1942

In the course of phase 3, mapping activities had proliferated, for forestry, mining, irrigation and agriculture, cadastre, railways and educational purposes. The caesura of 1905 is inserted because at that time the Central Mapping committee was set up which saw to it that all general mapping endeavours were to be coordinated, and all reproduction work was to be executed by the topographic survey. A new mapping system was set up by the director Major J.J.K. Enthoven, that went for continuous coverage (grid sector maps) instead of administrative unit maps; the printing scale was increased to 1:50 000. In 1925 a general sheet division based on the prime meridian of Batavia was introduced. The contents of the maps was no longer focused so much on land use information but rather on a combination of land use information and terrain representation, with contour lines, layer zone tints and rice cultivation areas (see figure 5).

What the Dutch missed in Europe, they found in abundance in the Indies: mountains, and consequently engaged in experimentation of relief portrayal, which was influenced by Austrian cartographers like Peucker and Swiss cartographers like Imhof. The work of the survey was also characterised by scientific research; a geographer's post was created to deal with the research; and the survey was able to attract experts like Van Valkenburgh who later on became professor of geography in Princeton, and Pannekoek, who was the main theoretician on map generalisation until the 1980s. Their contributions were incorporated into the annual reports of the topographic survey that appeared from 1905-1939.

The indigenous population was also involved in the mapping, as both the topographic parties and the draughtsmen were mainly composed by them. The training school in Malang also admitted them, and in the annual reports we find many examples of the master pieces of the Javanese topographers, mainly crater maps with their elaborate systems of contour lines.

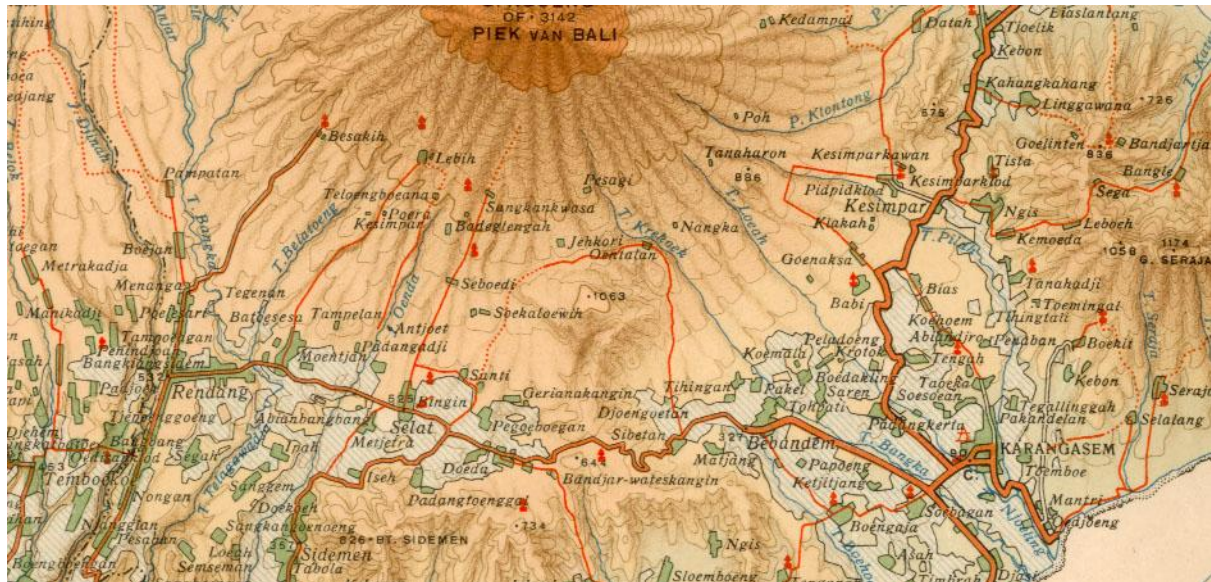


Figure 5 – Detail from a 1:200 000 overview map of Bali, combining layer zones, hill shading and land use colouring

## HYDROGRAPHY

In line with the original maritime exploration of the archipelago, hydrographers preceded topographers in the East Indies. In the time of the Dutch East India Company (VOC) its overseas seat, Batavia, had a map office where a master map-maker was employed to keep track of all new discoveries and draw them in on master maps in the central map collection, and from this collection issue up-to-date charts of Southeast and East Asia. About 1780 this office was transferred to the naval academy in Semarang. In 1816 a colonial navy was established which undertook a number of surveys, but these were undertaken mostly by regular naval vessels. It took until 1858 to have a regular survey ship commissioned for the purpose; by that time the colonial navy had been absorbed into the Netherlands navy, but a subsidiary hydrographical bureau was set up in Batavia. In the second half of the 19<sup>th</sup> century charts were drawn in this bureau and printed in Batavia by the printing office of the topographical survey; this meant they could be made available two years earlier than if they would have had to be sent to the Netherlands for printing. The hydrographic bureau and printing were transferred to the Netherlands, again for budget reasons, in 1898, but at least at that time 4 survey vessels were operating permanently in Indonesian waters, systematic charting was executed since the 1860s; by 1940 there was a publications programme with some 350 charts.

## SPECIAL ASPECTS

Far from the mother country, it was easier to experiment with new ways of representation. Moreover, the flat and small mother country did not prepare for the mountainous and vast area where other mapping techniques were called for and developed. Photogrammetry developed early here, and there was much experimenting with contour lines, hill shading and layer tinting according to the various German, Swiss and Austrian schools. The 20<sup>th</sup> century land use representation developed in the Netherlands East Indies is completely original, adapted to the mountainous terrain, in combination with hill shading and contour lines. It succeeded a much more taxonomically detailed 19<sup>th</sup> century land use representation, combined with hill shading only.

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## LEGACY

Unlike British mapping in India, in Indonesia the legacy of Dutch mapping is not acknowledged. Indonesia's topographical service is currently part of a larger entity, Bakosurtanal, which co-ordinates all cartographic activities carried out on behalf of government. As such it may be regarded as the successor to the Central Mapping Committee to co-ordinate all government surveying and mapping activities established in 1905. It still upholds the concept Enthoven established in 1905 that a topographical service ought not to provide only for the military but also, and primarily, should serve the general interest. New topographical map series have been started, with different contents and symbols. Of all

map series the current Indonesian nautical charts are the one that correspond most closely to the old models: in terms of both workmanship and format they show continuity with the production as carried out prior to 1951. Also, all names on modern Indonesian maps were in fact determined during the Dutch period, taking account of the post-independence changes in spelling.

To this day, many of the triangulation pillars erected during the Dutch period still stand, for instance on some volcanoes that were once used as triangulation points. When looking at Indonesia's present landscape, which is so much more shaped by human activities than was the case in the 1860s, one might easily forget what enormous logistical problems the cartographers of old must have faced when doing their fieldwork.

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**Biography**

Ferjan Ormeling is professor of Cartography at Utrecht University, member of the Explokart Research Group for the History of Cartography and of the Working Group on the History of Colonial Cartography. He has published on the colonial cartography of the Netherlands and has just completed a history of the Bosatlas (1877-1905), the major school atlas of the Netherlands