

Chapter 4

The Debate about Acclimatization in the Dutch East Indies (1840–1860)

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Introduction

According to David Arnold, the two characteristics of early tropical medicine are the “sense of difference” and the “power of localism”.¹ These features can indeed be found in the debate about tropical climate as a cause of disease in the Dutch East Indies. Around the middle of the nineteenth century, the two topics most commonly discussed by physicians in the Malay Archipelago were first, the problem of unhealthy places and the local causes of disease, and second, the problem of acclimatization. In the historiography of “Europeans in the tropics”, innumerable accounts can be found of their struggle-in-vain against heat, rain and poisonous animals, and their becoming debilitated as a result of unfamiliar infections, lack of drinking water and proper food. These experiences greatly influenced the views of European physicians working in the Dutch East Indies on the feasibility of their countrymen living a healthy life in the tropics. Or, as Charles Darwin put it: “When civilised nations come into contact with barbarians the struggle is short, except where a deadly climate gives its aid to the native race”.²

In the Dutch East Indies, all physicians were convinced of the existence of unhealthy places—in line with the Hippocratic notion that connected health and disease with “airs, waters, and places”—as they themselves experienced these places as such. Hippocratic ideas were so useful in explaining the maladies of the tropical environment that colonial physicians stuck to them much longer than their colleagues in Europe. As a result, the new scientific medicine—in the Netherlands strongly advocated by young physiologists such as Franciscus C Donders (1818–1889), Izaak

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¹ D Arnold, ‘Introduction: Tropical Medicine before Manson’, in D Arnold (ed.), *Warm Climates and Western Medicine: The Emergence of Tropical Medicine, 1500–1900*, Clio Medica, no. 34, Amsterdam and Atlanta, Rodopi, 1995, pp. 1–19, on p. 6.

² C Darwin, *The descent of man* (1871), cited in A W Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900–1900*, Cambridge, Cambridge University Press, 1993, p. 132. See also C Darwin, *The Descent of Man, and Selection in Relation to Sex*, 2 vols, London, John Murray, 1898, vol. 1, p. 282, for a more optimistic view on man’s possibilities: “Man can long resist conditions which appear extremely unfavourable for his existence”.

The Debate about Acclimatization in the Dutch East Indies

van Deen (1805–1869) and Jacobus A F Moleschott (1822–1893)³—found little acceptance in the Malay Archipelago.

This chapter focuses on the views of some of the leading medical men in the Dutch East Indies who argued over old and new ideas in medicine. A physician of German origin, Franz Wilhelm Junghuhn (1809–1864), represented the modern approach to medicine. His main opponent was *doctor medicinae* Cornelis Swaving (1814–1881). Intermediary positions were taken by some military health officers, most notably Willem Bosch (1798–1874), who, interestingly, changed his views on the possibility of acclimatization.

Their disagreements appear related to the differences in their medical education. Godelieve van Heteren has drawn attention to the varieties of “colonial medical narrative” during the second half of the nineteenth century.⁴ Somewhat earlier, around the middle of the century, there was an even greater variety of narrative: old Hippocratic concepts existed next to Brunonian ones, overlain by “physiological medicine” and ideas from the natural sciences.⁵ It is striking that the scientific approach to medicine—the “modern” approach—did not at first lead to the conviction that a tropical climate as such was not unhealthy. On the contrary, analysis of scientific data as well as the use of statistics seemed to show how unhealthy the tropics were. With the Hippocratic and Brunonian approaches, there was more flexibility to allow for men’s adaptation and acclimatization to a strange environment. Given this, it is understandable that some leading physicians were reluctant to accept a scientific approach to medicine. Views of physicians on the influence of climate were not confined to their medical circles; they had a far wider impact, on public opinion and on political decision-taking in the Netherlands. As long as the government believed in a “deadly climate” and denied the possibility of a healthy life for Dutchmen in the tropics, people were not encouraged to colonize and settle in these distant regions.

The Dutch East Indies as an Unhealthy Place

From the early days of the Dutch East India Trading Company (V.O.C.), physicians in the Netherlands had wondered about the effect of the tropical climate on the health of Europeans. As late as the first decades of the nineteenth century, the views of *medicinae doctor* Jacobus Bontius (1592–1631), the first Dutch physician to write on this issue in his book *De medicina indorum libri IV*, were still taken for granted.

³ See A de Knecht-van Eekelen, ‘Een fysiologische geneeskunde. Opvattingen over de natuurwetenschappelijke grondslagen van de geneeskunde in Nederland in het midden van de negentiende eeuw’, in D de Moulin (ed.), *Kracht en stof. De introductie van moderne natuurwetenschappelijke denkwijzen in de geneeskunde, zoals blijkt uit Nederlandse medische vakbladen, 1840–1870*, Amsterdam, Rodopi, 1985, pp. 20–32.

⁴ G M van Heteren, ‘Which Differences will Have to Go. The Variety of Physiological Differentiations in the Colonial Context of Java 1860–1900’, in P Boomgaard, R Sciortino and I Smyth (eds), *Health Care in Java. Past and Present*, Leiden, KITLV Press, 1996, pp. 5–21, on p. 6.

⁵ See, for a comparison with English sources, M Harrison, ‘“The Tender Frame of Man”: Disease, Climate, and Racial Difference in India and the West Indies, 1760–1860’, *Bulletin of the History of Medicine*, 1996, 70: 68–93.

Having discussed “the qualities of the air, the seasons of the year, the times of the day and the winds most common in the Indies”, Bontius stated:

[T]he rainy season, or summer, is the most unhealthy, as the heat and moisture of the air are deservedly reckoned by naturalists the efficient causes of putrefaction. But for the morning and evening breezes, which prevail in that season, and the thick and cloudy constitution of the air protected from the heat, this country would be uninhabitable (for its intolerable heat) . . . On the other hand, in the dry season, and during a clear state of the air, the people here are healthy. For then, too, the winds blowing with greater coolness, ventilate and purify the atmosphere still more.⁶

Bontius clearly accepted intolerable heat as one of the main causes—although not the exclusive cause—of the unhealthiness of tropical climates. Among the causes of death, too, were “the constitution of the air” that engendered “fevers”, and the soldiers’ way of life. The frequent occurrence of lung diseases and of catarrhs were also thought to be caused by these factors. Bontius wrote:

The soldiers and sailors are particularly susceptible to these disorders, by reason of the pernicious custom of laying themselves down on the ground after they have drunk pretty heartily, and sleeping without any covering, exposed to dews and vapours. And here let me observe by the way, that lodging in the upper floor of the house, is far more wholesome than below.⁷

Of course “the fevers” were a much dreaded cause of death. Fever “commonly attacks people with such a violence here, as in an instant to deprive them of reason, and with a phrenitis, and incessant delirium, often kills them in a few days, or even hours”.⁸ Other sicknesses characteristic of the tropical climate were the “fluxes of the belly”, especially dysentery; “tenesmus”, which is “an ulceration of the intestinum rectum” named “*druyploop*”;⁹ cholera; disease of the liver; dropsy; jaundice and beriberi, at that time a disease unknown in Europe of which Bontius gave a first full description. In consequence, during the seventeenth and eighteenth centuries, the mortality among the Dutch visiting the Malay Archipelago was extremely high. People in the Netherlands knew how few of their fellow countrymen returned from a trip to Batavia, a reason why the V.O.C. often had trouble finding enough men to sail their ships. Yet those who survived could make a lot of money, which made the enterprise attractive to adventurous spirits. During the eighteenth century, each year some 5000 servants of the V.O.C. arrived in Batavia. Mortality among the newcomers rose to more than 50 per cent in some years and, as so few of the crew survived their stay in Batavia, the Company had major problems in manning its

⁶ J Bontius, ‘Dialogues on the Preservation of Health and on the Diet most Suitable in the Indies’, in *Opuscula Selecta Neerlandicorum de Arte Medica*, Fasc. 10, Amsterdam, ‘Sumptibus Societatis’, 1931, pp. 52–99, on p. 61; Bontius’ *De medicina indorum libri IV* was published by his brother after his death in 1642; the book became very influential during the following centuries; it was translated into Dutch in 1694 and an English version was printed as late as 1769 under the title *An Account of the Diseases, Natural History, and Medicines of the East Indies. Translated from the Latin of James Bontius, Physician to the Dutch Settlement at Batavia*, London, T Noteman; I took the translation from the 1769 edition.

⁷ Bontius, *An Account of the Diseases* . . . , op. cit., note 6 above, p. 155.

⁸ *Ibid.*, pp. 167, 163.

⁹ *Ibid.*, p. 127.

The Debate about Acclimatization in the Dutch East Indies

ships for the return journey to the Netherlands.¹⁰ In 1795, the V.O.C. was forced to end its activities due to the unfavourable political situation and increasing debts.

As the main interest of the V.O.C. was trade and the soldiers serving the Company were mercenaries paid to protect this trade, little had been done to improve living conditions. Scientific research during the seventeenth and eighteenth centuries was primarily the result of personal interest. It was not until 1807 that the Dutch began putting more effort into organizing their affairs in the Archipelago. When Herman Willem Daendels (1762–1818), the first Governor-General of the Dutch East Indies, organized an army of 20,000 natives, he gave orders to construct barracks, hospitals, military schools, weapons factories, and—most importantly—a road through Java enabling the exploration of the island.¹¹ During the period of British administration (1811–1816), Thomas Stamford Raffles (1781–1826) encouraged the cultivation of arts and sciences through the Bataviaasch Genootschap voor Kunsten en Wetenschappen (Batavian Society for Arts and Sciences) as he had done through the Asiatic Society in Calcutta.¹² Although the Batavian Society had been founded in 1778, it had lingered in a “state of apparent death” since 1792. Inspired by Raffles, two volumes of the Society’s journal were issued in 1814 and 1816, containing significant medical contributions to therapeutics, as had been the case before 1792.¹³

Around 1820—after the reinstatement of the Dutch government—the European community in the Archipelago consisted of military men, among them military health officers, administrators and a small number of other civilians. Most Europeans lived in Batavia, Semarang and Soerabaja, the three larger cities on Java. On the other islands, the outposts or *buitenbezittingen* as they were called, only a few Europeans were found: often fewer than ten, with at most one military health officer. The military medical force increased from 90 officers before 1820 to 156 fifty years later; between 1816 and 1856, a little over 600 Dutch and German military health officers served in the Archipelago.¹⁴ The fact that the number of Europeans was small, and that most of them were men and belonged to the military, influenced the discussion of health problems. This situation changed after 1858 when immigration by Dutch civilians increased and more agricultural and industrial activities were undertaken.

European Physicians in the Dutch East Indies During the First Half of the Nineteenth Century

During the first half of the nineteenth century, colonial medical practice as well as scientific research were largely in the hands of military health officers. Before

¹⁰ P H van der Brug, *Malaria en malaise. De VOC in Batavia in de achttiende eeuw*, Amsterdam, De Bataafsche Leeuw, 1994, p. 244.

¹¹ D Schoute, *Occidental Therapeutics in the Netherlands East Indies during three Centuries of Netherlands Settlement*, Batavia, G Koff, 1937, pp. 99–103.

¹² M J Sirks, *Indisch Natuuronderzoek*, Amsterdam, Amsterdamsche Boek- en Steendrukkerij v/h Ellerman, Harms, 1915, pp. 83–4.

¹³ Schoute, op. cit., note 11 above, p. 111.

¹⁴ A de Knecht-van Eekelen, ‘De invloed van ’s Rijkskweekschool voor Militaire Geneeskundigen op de geneeskunde in Nederlandsch Oost-Indië’, in D de Moulin (ed.), *’s Rijkskweekschool voor Militaire Geneeskundigen te Utrecht (1822–1865)*, Amsterdam, Rodopi, 1988, pp. 95–109.

1845, these physicians were not very highly qualified, few of them had studied at a university or had been trained otherwise. Between 1819 and 1845, only seven students from the 's Rijkskweekschool voor Militaire Geneeskundigen (State Academy of Military Health Officers) left for the colonies.¹⁵ This situation improved after 1845, the year in which the Dutch government provided a sum of 400 DFL for each student at the Academy who was willing to join the forces in the Indies.¹⁶ Only about two-thirds of the military health officers were Dutch; many of the others were Germans. In the small intellectual community on Java, a number of physicians regularly complained about the absence of intellectual interests among their colleagues. Until 1838, the Bataviaasch Genootschap voor Kunsten en Wetenschappen should have been the intellectual centre of the Archipelago, but even this learned society had problems with the production of its journal because of a lack of contributors.

For our purposes, the small number of intellectuals creates a convenient opportunity to identify those involved in the debate about the influence on health of tropical climates. All came to the Dutch East Indies as military health officers and, except for Swaving, who had studied at Leiden University, none of them had a university degree. Swaving's position was exceptional as he left the military after ten years' service and in 1851 settled for the next twenty years as town physician in Batavia. Other military health officers who published in one of the scientific journals in the Dutch East Indies were: Bosch, Geerlof Wassink (1811–1864), Pieter Bleeker (1819–1878), and Junghuhn. Bosch and Wassink both served as General Inspector of the Military Medical Service: Bosch from 1845 to 1856 and Wassink from 1859 to 1864. Together they founded in 1851 the Vereeniging tot Bevordering van Geneeskundig Wetenschappen in Nederlandsch-Indië (Society for the Promotion of Medical Sciences in the Dutch East Indies); this Society published a journal. Bleeker had edited a journal as well, the short-lived *Natuur- en Geneeskundig Archief voor Neêrland's-Indië* (Scientific and Medical Archive of the Dutch East Indies) (1844–1847).¹⁷ With Swaving he founded in 1850 the Koninklijke Natuurkundige Vereeniging voor Nederlandsch-Indië (Royal Dutch Society for Natural History in the Dutch East Indies). Although he was one of the intellectual leaders during this period, he was not very popular among his subordinates as, in their view, he misused his position for his own benefit.¹⁸

Bleeker holds a very exceptional position as officer of health. He has no duties in the Hospital or in the garrison and spends all of his time on the description of fish, which has gained him

¹⁵ A P M Langeveld, 'Van applicatiecursus tot kweekschool. De beginjaren van de militair-geneeskundige opleiding in Nederland', in de Moulin (ed.), op. cit., note 14 above, pp. 17–34, on pp. 31–2.

¹⁶ H Beukers, 'Bloei en kritiek. Het onderwijs onder de inspecteurs Beckers en Snabilië', in de Moulin (ed.), op. cit. note 14 above, pp. 35–48, on p. 39.

¹⁷ G A Lindeboom, *Dutch Medical Biography: A Biographical Dictionary of Dutch Physicians and Surgeons 1475–1975*, Amsterdam, Rodopi, 1984, pp. 159–60.

¹⁸ D Doijer, *Uit het dagboek van Derk Doijer (1827–1896)*, n.p., n.d., p. 89. Fragments of this diary have been published in typescript by Doijer's family.

The Debate about Acclimatization in the Dutch East Indies

a certain reputation as an ichthyologist. He is a member of the examination committee for the officers of health third and second class who want to obtain a higher rank.¹⁹

All candidates were obliged to send fish to Bleeker before they took the exam, as this would increase their chances of passing. Nevertheless, Bleeker's as well as Wassink's importance is undeniable. One of their subordinates mentioned that he wanted to return to the Netherlands to learn about new scientific methods in medicine to be able to compete with people like them.²⁰

Junghuhn, who started the discussion on the influence of tropical climates, came to Java in 1835 and lived in the Archipelago until his death in 1864, a period interrupted only by a few years' European leave. During the first seven years of his stay on the island, he had to perform his duties as a military health officer, but from 1845 he was allowed to devote all his time to a study of the natural history of the Archipelago. He published some major botanical works on the plants of Java and Sumatra and a four-volume standard work, entitled: *Java, zijne gedaante, zijn plantentooi en inwendige bouw* or, as the German title reads: *Java, seine Gestalt, Pflanzendecke und innere Bauart*. From 1857, he was head of the cinchona-culture on Java, one of the profitable enterprises of the Dutch government.²¹ Junghuhn believed deeply in the potential of scientific methods, in fact he was a great admirer of Alexander von Humboldt, whose work he tried to emulate.²² He put forward "experience and observation" as the only means for reaching a higher level of knowledge:

We are living in an era in which one cannot afford any other conclusions in the field of natural sciences (that surely includes medicine) than those that are allowed by propositions and in which opinions have no value a priori . . . Only those conclusions are useful which can be proven as results of observation and experience.²³

Junghuhn thought little of priests, churches or the Christian religion, believing instead in Nature. Man needed to unravel the laws of nature; only through a knowledge of the physical world do we come closer to our Creator, to "God's Supreme Wisdom", as Junghuhn put it.²⁴ In order to obtain this knowledge we

¹⁹ Doijer, op. cit., note 18 above, p. 93: "Bleeker neemt als officier van Gezondheid een zeer exceptioneele positie in. Hij doet noch in het Hospitaal noch in het garnizoen dienst en houdt zich slechts bezig met de beschrijving van visschen, op grond waarvan hij den naam van ichthyoloog gekregen heeft. Hij is lid der examencommissie voor officieren van gezondheid 3^{de} en 2^{de} klasse, die den hoogereren rang wenschen te verkrijgen".

²⁰ Ibid., pp. 128–9.

²¹ *Gedenkboek Franz Junghuhn 1809–1909*, 's-Gravenhage, Martinus Nijhoff, 1910.

²² Max C P Schmidt, 'Junghuhn's Leben', in *Gedenkboek Franz Junghuhn 1809–1909*, op. cit., note 21 above, p. 16. See also Max C P Schmidt, *Franz Junghuhn. Biographische Beiträge zur 100. Wiederkehr seines Geburtstages*, Leipzig, Verlag der Dürr'schen Buchhandlung, 1909; C W Wormser, *Frans Junghuhn*, Deventer, W van Hoeve, n.d. (± 1942); Sirks, op. cit., note 12 above, pp. 141–53.

²³ F Junghuhn, 'Nog een woord, gevoegd bij het iets over acclimatisatie van dr. Swaving', *Indisch Magazijn*, 1844: first dozen nr. 4, 5, 6, pp. 316–33, on p. 325: "Wij leven in een tijd, waar men op 't gebied der natuurwetenschappen (van welke de geneeskunde toch zeker een tak uitmaakt) zich geene andere gevolgtrekkingen mag veroorloven, dan die door praemissen worden toegestaan, en waar meeningen a priori geene waarde hebben . . . Alleen die conclusiën hebben waarde, welke, als resultaat van waarnemingen en ondervinding, bewezen kunnen worden".

²⁴ De Gebroeders Dag en Nacht, *Licht en schaduwbeelden uit de binnenlanden van Java*, Leiden, Jacs. Hazenberg Corns. Zoon, 1854, p. 139.

should make as many observations as possible on all aspects of nature. During the 1850s, he published under the name *Gebroeders Dag en Nacht* (Brothers Day and Night) a number of radical dialogues, entitled *Licht en schaduwbeelden uit de binnenlanden van Java* (Images of Light and Shadow from the Java Interiors). In 1855, he was one of the founders of the radical, anti-Catholic, and atheist *De Dageraad* (The Daybreak), the journal of the movement of free-thinkers that wanted to liberate science and scientific thought from the influence of church and theology.²⁵ In his view, it was impossible to combine science with the Christian religion, as “religion until now has only furthered ignorance and superstition” and “the light that started to glow in the night of superstition and deceit owes its origin to the study of *natural sciences*”.²⁶

Military Health Officers and Their Publications

Following the new approach by the Dutch administration in the Archipelago, the military acknowledged the need for data on a variety of places. It was well known that the health of military personnel varied a great deal from one encampment to another but it was not understood why. Some data had already been collected during the first decades of the nineteenth century, and in the 1840s new initiatives were encouraged. Willem Bosch, himself one of the few people who survived the tropical climate and who remained in the Indies—with some breaks—for forty years (from 1817 to 1856), stimulated a scientific approach to health problems. He wrote on several aspects of medicine, hygiene, organization and education.²⁷ In one of his articles he explained why so little had been published on tropical diseases. Physicians, and especially military health officers, were too occupied with their duties, underpaid, little respected, not given encouragement to study and had no opportunity to read, write or publish. Their reports—also the ones on medical topography—disappeared in the archives from which never a sheet was retrieved. In *De dysenteria tropica*, Bosch also mentioned that during the preceding four years he had tried in vain to create an *Oostindisch geneeskundig Tijdschrift* (East India Medical Journal). Such a journal and other publications on tropical diseases should contain the essential information for physicians travelling to the tropics, inexperienced as they were with respect to endemic diseases.²⁸ It could have been complementary to the *Tijdschrift*

²⁵ E H Kossmann, *De Lage Landen 1780–1940. Anderhalve eeuw Nederland en België*, Amsterdam/Brussels, 1979, p. 224; O Noordenbos, et al. (eds), *Bevrijdend denken. Gedenkbundel ter gelegenheid van het honderdjarig bestaan van de Vrijdenkersvereniging De Dageraad*, Amsterdam/Antwerp, Wereld-Bibliotheek, 1956, p. 47.

²⁶ De *Gebroeders Dag en Nacht*, op. cit., note 24 above, p. 25: “. . . dat de Christelijke geloofsleer tot heden slechts onwetendheid en bijgeloof heeft bevorderd . . . en dat het licht, hetwelk . . . in den nacht van waangeloof en bedrog . . . is begonnen te gloren, zijn oorsprong is verschuldigd aan de beoefening der natuurlijke wetenschappen”.

²⁷ A H Borgers, *Doctor Willem Bosch en zijn invloed op de geneeskunde in Nederlandsch Oost-Indië*, Utrecht, Kemink en Zoon, 1941.

²⁸ W Bosch, *De dysenteria tropica, benevens een vlugtig onderzoek aangaande de vraag: of de mensch de natuurkundige geschiktheid heeft, om zijn geboorte grond te verlaten, en elk klimaat te gaan bewonen? Door berekening der sterfte in Oostindien wederlegd*, 's-Gravenhage, P H Noordendorp, 1844, pp. VI and X.

The Debate about Acclimatization in the Dutch East Indies

voor *Neêrland's Indië* (Journal for the Dutch East Indies), first issued in 1838, which heralded the growing interest in colonial natural history. From 1844 onwards, several attempts were made to produce medical journals, while some books on specific tropical diseases were published in which physical and statistical data were combined with other information on etiology, diagnosis and therapy. Both Bosch and Bleeker²⁹ wrote books on dysentery of which that by Bosch, *De dysenteria tropica*, is the most interesting because in it he discussed the effects of tropical climates. During his stay in The Hague some months before he was appointed General Inspector of the Military Medical Service in the Archipelago, Bosch's complaints on the lack of scientific interest among his colleagues were noted. In his new position, he had every opportunity to improve the situation. However, before Bosch returned to the Archipelago in 1845, others, in particular Bleeker, had already established the new medical journal *Natuur- en Geneeskundig Archief voor Neêrland's-Indië*.

In this, Bleeker started a series of reports on the medical topography of Batavia, encouraging others to do the same for their posts.³⁰ Indeed, more topographies were published, but these did not add up to the large flow Bleeker desired, and there was a lack of manuscripts. In fact, the full text of his own series was published, too, in the *Tijdschrift voor Neêrland's Indië*. In 1847, his journal ceased publication; another journal, *Indisch Magazijn* (Indian Magazine), existed for only two years (1844 and 1845).

In these journals we can find different types of topographical reports. In the first, emphasis was put on the gathering of physical data in certain places. In Europe collecting meteorological data had long been popular, and this type of description is not characteristic of the new scientific medicine. Yet such measuring neatly fitted the objectives of the scientific method. Several military health officers, for instance Wassink, published their measurements of temperature, wind and weather conditions, data that were seen as the basis for a medical topography. At this time, Wassink was stationed on Amboina where he recorded the weather in great detail, day-by-day, and hour-by-hour. In addition, he made observations on prevailing diseases, for instance on the commonly occurring "Catarrhal Rheumatism".³¹

A second type of data collection was statistical, mostly of mortality figures over a fairly long period of time. From 1816 onwards, Bleeker himself collected information on the mortality of the military personnel. This type of statistics became popular because it provided clear-cut data that could be compared with those from other places, precisely as required by scientific medicine. One of Bleeker's observations was, for instance, that mortality among soldiers in the Dutch East Indies was 1 in 15, while in Amsterdam the rate was 1 in 35 and in Liverpool 1 in 101. He drew the obvious conclusion that the Dutch East Indies were relatively unhealthy.³²

²⁹ P Bleeker, *De dysenterie van een pathologisch-anatomisch standpunt beschouwd*, Batavia, Drukkerij van Lange & Co., 1849.

³⁰ P Bleeker, 'Bijdragen tot de geneeskundige topographie van Batavia', *Natuur- en Geneeskundig Archief voor Neêrland's-Indië*, 1844, 1: 1–80, 169–220, 523–62; 1845, 2: 497–534.

³¹ G Wassink, 'Waargenomen thermometer-standen etc.', *Natuur- en Geneeskundig Archief voor Neêrland's-Indië*, 1844, 1: I.

³² P Bleeker, 'Fragmenten voor eene geneeskundige statistiek van het leger in Neêrland's Oost-Indië', *Natuur- en Geneeskundig Archief voor Neêrland's-Indië*, 1845, 2: 140–2, 274–6.

Third, there were the elaborate monographs on specific places, the *Geneeskundige plaatsbeschrijving* (Medical Topography). Not only physical, chemical and biological aspects of climate (air, water, soil, temperature) were recorded, but also characteristics of the population, their way of life, health and disease. By combining the data from the non-living with the living world, one should be able to draw a picture of their interrelations, and then measures to improve health could be taken. During the 1840s, a medical topography of Amboina and one of Semarang, were published for public consumption.³³ The latter had originally been written as a report for the military medical service, as compiling this type of medical topography was an official task of military health officers. In the 1850s, the “inspector of the medical service of the marines” issued a format for these reports, showing how to construct a medical topography. Two paragraphs were required, one on the local situation and one on climate, describing the following topics:

Paragraph I

1. Geographical location, size and area of the place;
2. History of the fortress;
3. Geological and hydrostatic matters; altitude of the surrounding mountains, the plateaux, the valleys, tides, streams, marshes, lakes, ponds, inundations, etc;
4. Condition and fertility of the soil, vegetation, medicinal plants used by the natives;
5. Number, size and architecture of houses, with respect to light, air, heat and hygiene;
6. Natural history of the country;
7. Agricultural situation;
8. Number of inhabitants, their temperament, constitution, nutrition, character, moral development, speech, clothing, religious and other folk customs, vices, marriages, their prosperity, industry, trade, physical and moral education of the children; health condition of the inhabitants, their average lifespan, the most frequent diseases, the most successful remedies against these, the ratio of the still-born and the mortality in the first year of life. The proportion of the mentally ill.

Paragraph II

1. Geographical location above sea level;
2. Atmospheric pressure and humidity;
3. Sunshine, temperature, seasons, wind (direction and strength).³⁴

³³ F Epp, ‘Geneeskundig-topographische schetsen van Amboina’, *Natuur- en Geneeskundig Archief voor Neerland's-Indië*, 1844, 1: 285–95, 449–69; M J E Muller, ‘Geneeskundige topographie van Samarang’, *Natuur- en Geneeskundig Archief voor Neerland's-Indië*, 1845, 2: 430–96.

³⁴ J van Hattem, ‘Extract uit de proeve eener geneeskundige geographische plaatsbeschrijving van het eiland Amboina’, *Nederlandsch Tijdschrift voor Geneeskunde*, 1858, 2: 529–42: “A. Plaatselijke gesteldheid. 1. Geographische ligging der plaats, grootte en omvang daarvan. 2. De geschiedenis harer vesting. 3. Geologische en hydrostatische aangelegenheden. Hoogte der omgevende bergen, de vlakten, dalen, vlooden, beken, moerassen, meeren, vijvers, overstromingen, enz. 4. Gesteldheid en vruchtbaarheid van den bodem, vegetatie, geneeskrachtige bij de inboorlingen gebruikt wordende planten. 5. Aantal, grootte en bouwtrant der woningen, ten opzichte van licht, lucht, droogte, warmte en zindelijkheid. 6. Natuurlijke geschiedenis der landstreek. 7. Landhuishoudkundige toestand. 8. De verhouding der inwoners, hun temperament, constitutie, wijze van voeding, hun karakter, zedelijke ontwikkeling, spraak, kleeding, godsdienstige en andere volksgebruiken, heerschende ondeugden, huwelijken, hunne welvaart, nijverheid, handel, lichamelijke en zedelijke opvoeding der kinderen. Gezondheidstoestand der inwoners, hun gemiddelde levensduur, de meest voorkomende ziekten, de daartegen meest beproefde en gunstige uitkomsten opleverende geneeswijzen, de verhouding der doodgeborenen en de sterfte in het 1ste levensjaar. De verhouding der zielsziekten tot den maatschappelijke toestand.

B. Invloeden van de luchtgesteldheid (klimaat). 1. Aardrijkskundige ligging boven de oppervlakte der

The Debate about Acclimatization in the Dutch East Indies

Some of these reports were published during the 1860s; others remained in the archives and were never looked at. Most health officers took little interest in theoretical reflections on topographical data. They used figures on temperature and wind to explain the incidence of disease in different garrisons during the year, and they advised on the feasibility of military expeditions according to the expected climatological circumstances.

Junghuhn's View on the Influence of Tropical Climate

In 1835, the very first year of his stay on Java, Junghuhn had the opportunity to cross the island. On a mission to Djockjakarta, he visited old ruins, studied geology and volcanoes, collected plants and insects and made optimistic remarks about the climate: "The climate of this country suites me wonderfully and and I don't understand how one could be ill here".³⁵ A very different reaction from that when he left the Indies in 1848 for a sojourn in the Netherlands:

My health was shaky and my physical strength reduced by my thirteen years' stay on Java and Sumatra. I suffered from the effects of the continuous influence of a great heat during so many years, which in the long run can be resisted by only a few of the people born in northern countries.³⁶

The high temperature of the tropical climate, Junghuhn believed, was the main reason for the health problems of Europeans. He had expressed this opinion for the first time in 1842, writing on *De gematigde en koude streken van Java* (The Temperate and Cold Regions of Java). He discussed the possibilities for establishing a convalescent home on the Dieng Plateau, with an altitude of over 6000 feet and a mean temperature of 53.5°F. The best remedy against tropical disease was to leave for cold regions in the mountains of Java. Junghuhn stated:

It is only the heat that makes us Europeans sick; it is primarily only the heat with its inseparable consequences and effects that causes all these belly diseases and the number of liver inflammations, dysentery, tropical sprue and gastric-choleric and nervous fevers

zee. 2. Drukking en vochtigheid van den dampkring. 3. De graad van zonschijn, gesteldheid van de temperatuur (thermometer-stand), de verhouding der jaargetijden, de rigting en kracht der heerschende winden."

³⁵ Schmidt, *Franz Junghuhn*, op. cit, note 22 above, p. 330; letter from Djoejakarta, 13 July 1836: "[L]e climat de ce pays me convient à merveille et je ne comprends pas comment on y peut être malade".

³⁶ F Junghuhn, *Terugreis van Java naar Europa, met den zoogenaamde Engelsche Overlandpost, in de maanden September en October, 1848*, Zaltbommel, Joh Noman en Zoon, 1851, p. 1: "Mijne gezondheid was geschokt en mijne lichaamskrachten waren door een dertienjarig verblijf op Java en Sumatra verzwakt geworden. Ik leed aan de gevolgen van den onafgebroken invloed eener grootte hitte, welken ik gedurende zoo vele jaren had ondervonden, waaraan slechts weinige menschen, in noordelijke streken geboren, op den duur weerstand kunnen bieden."

from which nearly all Europeans beneath the tropic of Cancer suffer at one time or another.³⁷

According to Junghuhn, all Europeans could be observed to lose their strength and health in the tropics, “which shows that it is a fallacy and against all experience to suggest that a European could ever acclimatize, something that will *never* occur”.³⁸ Subsequently, Junghuhn stressed that only scientific measurements should be used in a discussion about the influence of climate on the human organism. A closer analysis of the differences—especially the physical differences—between the moderate European and the hot tropical climates was needed. The following twelve scientifically definable factors had to be compared: gravity; magnetism and electricity; centrifugal forces; drinking water; miasmata from marshes; the production of gas from volcanic surfaces; the structure of the volcanic earth; vapours from volcanoes; the chemical composition of air; atmospheric pressure; and heat, especially continuous heat. Junghuhn discarded gravity, magnetism and electricity because they differed too little, and centrifugal forces because they had no known influence on health. Differences in drinking water, miasmata and the various volcanic criteria were local causes that could not account for the overall effect of climate. Chemical composition of air and atmospheric pressure could have no such effect. Yet there were physicians on Java who believed that moonlight might cause fevers, but according to Junghuhn these were caused by the cold and humid air at night. The only remaining factor, he believed, was tropical heat.³⁹

Junghuhn stated that one should recognize *tropical diseases of Europeans* as a special disease entity, as these maladies occur only among Europeans and only in the tropics. He did not explain the physiological processes that heat could cause, merely indicating the large number of Europeans who died or who had to return home because of ill health. He knew of no Europeans who had kept their health in the Indies. Everyone, including the few who survived for more than twenty years, suffered more or less from complaints of the liver, frequent stools, rheumatism etc., and everyone remained susceptible to acute illnesses. In other words, no European ever became acclimatized:

As long as our skin can not become the same as the skin of the natives . . . as long as our hair stays fair,—and as long our hot temper can not change into the indifferent unperturbed

³⁷ F Junghuhn, ‘De gematigde en koude streken van Java, met de aldaar voorkomende warme bronnen: uit een natuur- aardrijkskundig- en geneeskundig oogpunt beschouwd, als stellende een middel daar ter voorkoming en genezing van die ziekten, waaraan Europeanen, ten gevolge van hun lang verblijf in heete luchtstreken, gewoonlijk lijden’, *Tijdschrift voor Neêrland's Indië*, 1842, 4 part 2: 81–121, on p. 90: “Het is toch alleen de warmte, die ons Europeanen hier ziek maakt; het is oorspronkelijk alleen de warmte, met de van haar onafscheidelijke gevolgen en uitwerkselen, welke alle die onder-buikziekten en dat aantal van leverontstekingen, dijsenterien, tropische spruw en die gastrische-, galachtige- en zenuwkoortsen te weeg brengt, aan welke bijna alle Europeanen onder de keerkringen vroeg of laat lijden.”

³⁸ *Ibid.*, p. 113: “. . . om welke reden het ook valsch is en tegen alle ondervindig strijdt, te beweren, dat een Europeaan hier immer zoude kunnen acclimatiseren, het welk *nooit* geschiedt.”

³⁹ Junghuhn, *op. cit.*, note 23 above, pp. 316–33.

tranquillity of the Javanese, just so long ... will the glow of the *strange* climate be our burden.⁴⁰

Junghuhn Opposed by Swaving

Did Junghuhn receive support from his fellow physicians? Only partly. His main opponent was Swaving, who, in 1844, in reply to Junghuhn's first article, published 'Over den invloed van het klimaat dezer gewesten op den Europeaan' (On the Influence of Climate on the European in these Regions). Unlike Junghuhn, Swaving gave a more physiological and medical account, starting with "the influence of the temperature" and "the influence of the geographic and physical climate on the organism", but continuing with a discussion of "the causes that disturb the acclimatization process", and giving advice on "the best life style for Europeans before, during and after the acclimatization process".⁴¹ From this enumeration it is clear that Swaving believed in the possibility of acclimatization. He stated: "[W]e do not agree with Dr. Junghuhn that it is only the heat that causes disease in us Europeans and that we Europeans will never be able to acclimatize".⁴² Swaving looked for other explanations of the effect of high temperature on the functions of the body, and he found these in the writings of the German physician Andreas Röschlaub (1768–1835), one of the supporters of the Brunonian theory of sensibility and irritability.⁴³ This may come as a surprise, given that Röschlaub's views are believed not to have been popular in the Netherlands. Moreover, by the 1840s, the Brunonian theory had lost its support in Europe. It seems rather "old fashioned" of Swaving that he cited from Röschlaub's *Untersuchungen über Pathogenie* and wrote: "We shall see ... that Röschlaub, as later authors say, meant that the heat reduces irritability, but increases sensibility; Humboldt even tried to prove this with experiments".⁴⁴ According to Swaving, Röschlaub mentioned a combination of factors as the reason for the ill-effects of a tropical climate: hedonism, alcohol abuse, laziness, superstition, fanaticism, poor education, despotism, lack of healthy food and the use of opium. He himself supported the idea that tropical diseases were not caused by just one single factor: "When many causes together influence a nation, of one which alone is sufficient to induce directly or indirectly a large degree of weakness, how our judgement fails us when we want to *ascribe everything to one cause, namely the*

⁴⁰ Junghuhn, op. cit., note 23 above, p. 331: "Zoo lang onze *huid* niet dezelfde kan worden als die der inlanders ... zoo lang ons haar blond blijft, en zoo lang het opbruiseende ongeduld van ons temperament niet in de onverschillige, door niets te bewegen rust van den Javaan kan overgaan, zóó lang ... zal de gloed van het *vreemde* klimaat ons een last zijn."

⁴¹ C Swaving, 'Over den invloed van het klimaat dezer gewesten op den Europeaan', *Natuur- en Geneeskundig Archief voor Neerland's-Indië*, 1844, 1: 81–115, on p. 83.

⁴² *Ibid.*, p. 86: "... dat wij Dr. *Junghuhn* alzo niet nazeggen, dat het de warmte alléén is, die ons Europeanen hier ziek maakt, en dat wij Europeanen hier nooit acclimatiseren kunnen."

⁴³ N Tsouyopoulos, *Andreas Röschlaub und die romantische Medizin. Die philosophischen Grundlagen der modernen Medizin*, Stuttgart, Fischer, 1982.

⁴⁴ Swaving, op. cit., note 41 above, p. 84; he cites from A Röschlaub's *Untersuchungen über Pathogenie* (part 2, 1801, p. 168, § 1003): "Wij zullen zien ... dat *Röschlaub*, zoo als latere schrijvers ook beweren, bedoeld heeft, dat de warmte de irritabiliteit vermindert, de sensibiliteit daarentegen verhoogt. ... *Humboldt* heeft dit zelfs door proeven trachten te staven."

heat”.⁴⁵ Swaving also pointed to Colin Chisholm’s conviction, stated in his *Manual of the Climate and Diseases of Tropical Countries* (1822), that the heat of the sun by itself cannot be regarded as a direct cause of disease.

By presenting a very detailed description of changes in respiration, increase of perspiration, loss of appetite, congestion of liver and head, Swaving tried to explain the susceptibility to illness of Europeans during the process of acclimatization. The use of several classical concepts—such as those concerning the function of the liver and the liver as the centre of the body—put Swaving’s views in an even older, Hippocratic tradition. The organism can get used to the hot climate when the liver gradually “takes over a large part of the function of the lungs”. In that situation acclimatization means a “regular and gradual” takeover, “supported by the reduced activity of the stomach and the increased production of stools (which reduced the animal heat considerably)” so “the organism will notice fewer disadvantages of the change from a temperate to a hot climate”.⁴⁶

Statistics Support Junghuhn

Junghuhn was not the only one who doubted the suitability of tropical climates for Europeans. The subtitle of Bosch’s *De dysenteria tropica* reads: “a brief inquiry into the question whether man has the physical possibilities to leave his birthplace and to live in all climates? The which is disproved by a calculation of the mortality in the East Indies”.⁴⁷ Bosch clearly believed that man cannot leave his birthplace without harming his health. He based his argument on the other favoured scientific method: the use of statistics. Birth and mortality statistics for the Dutch East Indies showed that there was an important natural increase in the native population, whereas the mortality of Europeans was one and a half times as high as native mortality. During the period 1816–1832, every year more than 20 per cent of Dutch soldiers died.⁴⁸ These data could be accounted for if one assumed that the “racial physical constitution” determined that the most healthy life was lived in one’s country of birth. Bosch thought that “the Lord Creator” had appointed each race to a particular region on earth, so that if a European moved from Europe to the East Indies “with mathematical certainty, he will be not as healthy and he will not reach the age he would have reached had he stayed in his birthplace”.⁴⁹

⁴⁵ *Ibid.*, p. 85: “Wanneer nu op een volk zoo vele oorzaken gezamenlijk invloed hebben, waarvan reeds één voldoende is om direkt of indirekt grooten graad van zwakte voort te brengen, hoezeer dwaalt dan ons oordeel, wanneer wij aan ééne oorzaak, namelijk de *warmte, alles willen toeschrijven.*”

⁴⁶ *Ibid.*, p. 102: “. . . en wij zouden durven beweren, dat de geheele acclimatisatie daarin bestaat, dat de lever, ondersteund door de verminderde functie van de maag en door de vermeerde copropoësis (ten gevolge waarvan de dierlijke warmte aanmerkelijk getemperd wordt), een groot gedeelte der werkzaamheid van de longen overneemt. Naar mate nu die overname geregelder en traspewijze plaats vindt, naar die mate zal ook het organisme minder het nadeel van den overgang van een gematigd naar een heet klimaat ontwaren.”

⁴⁷ Bosch, *op. cit.*, note 28 above.

⁴⁸ A H M Kerkhoff, ‘The Organisation of the Military and Civil Medical Service in the Nineteenth Century’, in G M van Heteren, A de Knecht-van Eekelen and M J D Poulissen (eds), *Dutch Medicine in the Malay Archipelago 1816–1942*, Amsterdam and Atlanta, Rodopi, 1989, pp. 9–24.

⁴⁹ Bosch, *op. cit.*, note 28 above, p. 66: “. . . dat hij van Europa naar Oostindië verhuizende, dáár, met mathematische gewisheid, niet die gezondheid geniet, niet dien levensterm bereikt, welke hem op zijn’ geboortegrond zou zijn te beurt gevallen.”

The Debate about Acclimatization in the Dutch East Indies

The fact that Bosch found the tropical climate unsuitable for Europeans did not mean he discarded the possibility of acclimatization altogether. He thought that a few foreigners could become acclimatized, which meant that their physiology reached a balance with the environment. He did not know what caused the difference in the acclimatization potential between people, but he believed that there was a connection with the constitution of the blood and the activities of skin and liver. Surprisingly, Bosch combined new and old ideas. Together with the new statistics, he used the old Hippocratic approach in discussing etiology, prevention, therapy and prognosis of dysentery—one of the characteristic diseases of a tropical climate. In his advice for a healthy way of life and in particular his discussion of food, drink, clothing, movement and rest, parts of the “sex res non-naturales” can be discerned. Also, in his ideas on the production of stools from undigested food-products and on the formation of blood there is a Hippocratic basis with some additions of Brunonian terminology—irritability and sensibility—and a little from Liebig’s chemistry. To his contemporaries this seems to have been acceptable, as they did not comment on the mixed approach. However, although his use of statistics was approved by some because it was new and scientific, it was criticized by others who saw it as having dangerous implications.

One of his critics was Carl Gobée (1804–1875), a military health officer in Leiden and editor of a Dutch medical periodical, *Kliniek. Tijdschrift voor wetenschappelijke Geneeskunde* (Clinic. Journal of Scientific Medicine). Gobée thought that Bosch’s publication was subversive and a threat to the Dutch cause in the Indies because it presented a negative picture of living conditions.⁵⁰ As Gobée himself had never been to the tropics, military health officers in the Indies had little respect for this opinion. In their view, Gobée wanted to manipulate people in the Netherlands by withholding scientific information. They pleaded for the new approach in medicine: “Only after the truth is found and acknowledged, can the way forward and the appropriate means to avert the coming disaster be discovered. The physicians in the Dutch East Indies support this beneficial concept of the newer medicine!”⁵¹

Tropical Climate and Colonization

The discussion about acclimatization took a new turn in 1857, because the Dutch government had to consider the issue of colonization. Some Dutch merchants wanted to make new investments on islands other than Java and Madoera and they asked for government support. In their opinion, the government should finance people emigrating to the Indies, as the success of the Dutch venture would depend on Dutch labour and supervision. A pilot project was to give more information on the feasibility of this idea. On 16 July 1857, a State Committee was formed by *Royal Decree* (no. 90) to advise the government on the promotion of colonization of the Dutch East

⁵⁰ S L Heijmann, ‘Een woord over acclimatisatie’, *Natuur- en Geneeskundig Archief voor Neêrland’s-Indië*, 1846, 3: 311–59.

⁵¹ *Ibid.*, p. 317: “Eerst na ontdekte en erkende waarheid laten zich de te kiezen wegen en doelmatige middelen uitvinden, om het dreigende onheil af te weren. Deze alleen heilaanbrengende strekking der nieuwere geneeskunde huldigen ook de artsen in *Neêrland’s Indië!*”

Indies. From the start, the Dutch authorities favoured an experiment only, lacking reliable information on the problem of acclimatization:

On the question whether the European is able to endure labour under the clear Indian sky and whether a European colonization in the tropics is possible, there is a lot of discussion, based on poor results of such endeavours elsewhere, but the government takes the view that a satisfactory outcome can be obtained by a practical procedure only.⁵²

Of course the discussion about colonization was not confined to parliament. In newspapers and journals the pros and cons were debated. The remarks of Bosch are of interest, especially in relation to the issue of acclimatization. In 1858 he published an article on the subject in *De Gids* (The Guide), a leading cultural magazine. After his return to the Netherlands in 1854, Bosch lived as a pensioner, but kept a strong interest in colonial affairs and wrote several articles in favour of better treatment of the natives of the Indies.⁵³ From 1846 onwards, Bosch had collected meteorological reports and demographic data, but had not been able to have them analysed and compiled, because of a lack of personnel.⁵⁴ Also, data from his successor Wassink were still lacking in 1858. Nevertheless, from personal observations, Bosch came to the conclusion that around 1850 the mortality of colonial soldiers had been comparable to that in Europe. He therefore changed his ideas on unhealthy climates and stated that acclimatization is possible if conditions are favourable. Bosch saw no arguments against colonization if it were well organized and people could live in the mountains. During the first year's stay a person would be most susceptible to climatological influences, but after the period of acclimatization there would be no obstacles to a healthy and productive life. He stated: "Man is able to bear the influence of hot and cold climates by his ingenuity and exercise of will power".⁵⁵

Why did Bosch so radically change his views on acclimatization? He used the scientific statistical approach first (in 1844) to warn against hot climate and later (in 1858) to recommend the emigration of Dutch people to these regions. In fact, the mortality among the military had declined by the middle of the century, but this was also caused by the absence of large military expeditions during this period. And how useful were these military mortality figures for a mixed population of male and female civilians? What was Bosch's objective in promoting colonization? Some of his other publications give an answer to this question: Bosch strongly opposed the existing *cultuurstelsel*, the economic production system that obliged the natives to

⁵² Regeling van het gebruik van het Koloniaal batig slot over 1855 (Memorie van Toelichting), § 15, *Bijlagen van het Verslag der Handelingen van de Tweede Kamer der Staten-Generaal*, 1857–1858, p. 75: "Over de vraag, of de Europeaan tegen den arbeid onder den blooten Indische hemel bestand en uit dien hoofde eene Europeesche kolonisatie onder de keerkringen mogelijk zij, moge, met verwijzing zelfs tot de ongunstige uitkomsten die soortgelijke proefnemingen elders hebben opgeleverd, veel worden getwist, eene bevredigende oplossing schijnt der Regering toe slechts op den practischen weg te kunnen worden verkregen."

⁵³ See W R van Hoëvell and W Bosch, *De vrije arbeid op Java, behandeld in "Felix Meritis"*, 's-Gravenhage, Martinus Nijhoff, 1860; W Bosch, *Ik wil barmhartigheid en niet offerande. Eene wekstem aan Nederland tot regtvaardigheid en pligtsbetrachting jegens de Javanen*, Arnhem, H B Breijer, 1865.

⁵⁴ W Bosch, 'Een woord over de kolonisatie onzer Oost-Indische bezittingen', *De Gids*, 1855, 22 part 1: 165–88, on p. 173.

⁵⁵ Bosch, op. cit, note 54 above, p. 167: "Durch Vernunft und die Freiheit des Willens vermag der Mensch die Einwirkung der heissen und kalten Zonen zu ertragen".

The Debate about Acclimatization in the Dutch East Indies

produce crops for the Dutch export market. More Dutch investments and Dutch settlement in the Indies could put an end to this system of hidden slavery and create free labour opportunities for the natives.

A majority in parliament, too, was in favour of a colonization experiment. There had never been a well organized investigation into this matter, but it was known from the West Indies that a European could perform field labour under the tropical sun “without putting his life in danger”.⁵⁶ It was obvious, however, that the government did not want to spend any money on this project.⁵⁷ So the outcome of the debate was a typically liberal one: the government was not against exploitation of more islands in the Archipelago, but this should be financed by private enterprise. On the one hand, the government saw it as its task to further the administrative organization on these islands so as to make such enterprises possible. On the other, it did not want to rush things, so careful negotiations with the indigenous people were needed. The problem of acclimatization was set aside: decisions were based on business arguments and not on medical grounds.⁵⁸

Summary

Around the middle of the nineteenth century, conflicting views were put forward on the influence of climate on health and disease in the Dutch East Indies. In this part of the world, old Hippocratic ideas influenced views on the cause of disease much longer than in the Netherlands. Moreover, Brunonian theories—which had been discarded in the Netherlands—fitted the discussion about the effect of temperature on the body. Additionally, scientific medicine was introduced. Scientific methods, such as the collection of meteorological and statistical data, were promoted by a small group of military health officers. However, the use of scientific data did not guarantee a clear-cut opinion on the causes of disease. Numbers proved as disputable as other, less objective, medical observations.

Mortality statistics and numbers of patients especially were used as arguments in various discussions. The example of Bosch, who changed his views on the dangers of tropical climate, demonstrates that statistics could be used for different purposes. At first, in his position as General Inspector, he used them as an argument to provide better care for the military personnel; later, when retired and a civilian, he used them as justification for colonization in relation to an intended improvement of the living conditions of the natives. The dangers of tropical climate for the health of Europeans were played down as soon as other—primarily economic—motives for living in the tropics became strong enough.

⁵⁶ *Bijlagen*, op. cit., note 52 above, p. 396; Voorloopig Verslag der Commissie van rapporteurs.

⁵⁷ *Bijlagen*, op. cit., note 52 above, p. 593; Memorie van Beantwoording.

⁵⁸ Staatsbegroting voor het dienstjaar 1859 (Memorie van Beantwoording van het Voorloopig Verslag der Commissie van Rapporteurs voor Hoofdstuk XI), § 10, *Bijlagen van het Verslag der Handelingen van de Tweede Kamer der Staten-Generaal*, 1858–1859, p. 453.