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Investigating Global Resource Chains

The case of the global Danish plant oil complex

Matthias Heymann

This paper aims to investigate the establishment of global resource chains in the plant fat industry from the late nineteenth to the late twentieth centuries, in which the plant oil producing company Aarhus Oliefabrik in Aarhus, Denmark, and oil plantations in Malaysia of the Danish company United Plantations played a pioneering role. It summarizes details of a research project on the building and operation of resource chains from two different vantage points, one from the Aarhus plant oil industry reaching out to global resources, and one from the building and operation of Danish plantations in Siam, Malaya and Indonesia, reaching out for metropolitan users.

In the modern era, competition for global natural resources has become a crucial concern.¹ At the same time, resource exploitation has caused tremendous problems on a global scale such as growing inequality between the Global South and the Global North and dramatic social and environmental impacts.² In the early twenty-first century, tensions about global resources have increased significantly and produced additional pressures. Rising resource demands by China

and other emerging nations have led to aggressive competition for global resource rights with resource markets experiencing soaring prices and increasing volatility. On the other hand, resource demands in the industrial North pushed global deforestation and environmental change. In 2013, for example, European net imports of soybeans and soybean products for oil production and animal feed added up to around 27 million tons. These imports required global plantations for its production that represented more than six percent of the total agricultural area in the European Union and caused significant deforestation and carbon dioxide emissions.³ According to a scientific study, carbon dioxide emissions by Britain since 2005 have been about a third higher if the emissions caused by imported commodities are included.⁴ To account for the increased economic, social and environmental importance of natural resources, the Tensions of Europe Network in its flagship program Technology & Societal Challenges ca. 1800–2050⁵ has established a research group, Technologies, Environment and Resources, which consists of some fifty scholars and pursues research on the history of global resource chains as one of its focus areas.⁶

One major element in the scramble for global resources has been the establishment of large-scale plantations for tropical fruits by colonial powers, global corporations and emerging states in the Global South. Donna Haraway and others coined the term Plantationocene as an alternative to Anthropocene to emphasize the enormous historical role of these “factories in the fields” for the transformation of planet Earth. Plantations have exploited people and environments and dramatically transformed natural conditions and ways of life.⁷ Particularly Southeast Asia has become a hotspot of industrial agriculture and been called “one of the epicenters of the contemporary ‘Plantationocene’.” It is the source of 76 percent of the world’s natural rubber, 86 percent of the world’s palm oil, and 59 percent of the world’s coconut production.⁸

Plantations have exploited people and environments and dramatically transformed natural conditions and ways of life.

Historical research on global resources is well-established and extensive, but suffers from significant limitations: It tends to be predominantly framed by economic and trade history perspectives of the Global North or by environmental histories of the Global South. With our project we aim to write connected histories of global resource chains, which connect (a) colonial spaces of resource exploitation in the Global South and metropolitan spaces of resource consumption in Europe and (b) the global scramble for global resources and its social and environmental impacts. We envisage developing a framework and language for the study and better understanding of global resource chains and their social and environmental impacts, which comprise the following conceptual dimensions.⁹

- (1) Socio-cultural complexities: Resource chains do not simply connect different areas through trade, but link different cultural spaces and involve a plurality of connections such as people, languages, institutions, capital, knowledge, science and technologies, traditions, perceptions and narratives in both colonial and metropolitan spaces.¹⁰
- (2) Repertoires of power: Resource chains involved a large diversity of actors and power relations and the exertion of forms of hard and soft power. These include factors such as formal and informal hierarchies, playing out economic dominance, unequal treatises, networking and diplomacy, forging alliances, employing intermediaries, science and technological innovation in colonial and metropolitan spaces.¹¹

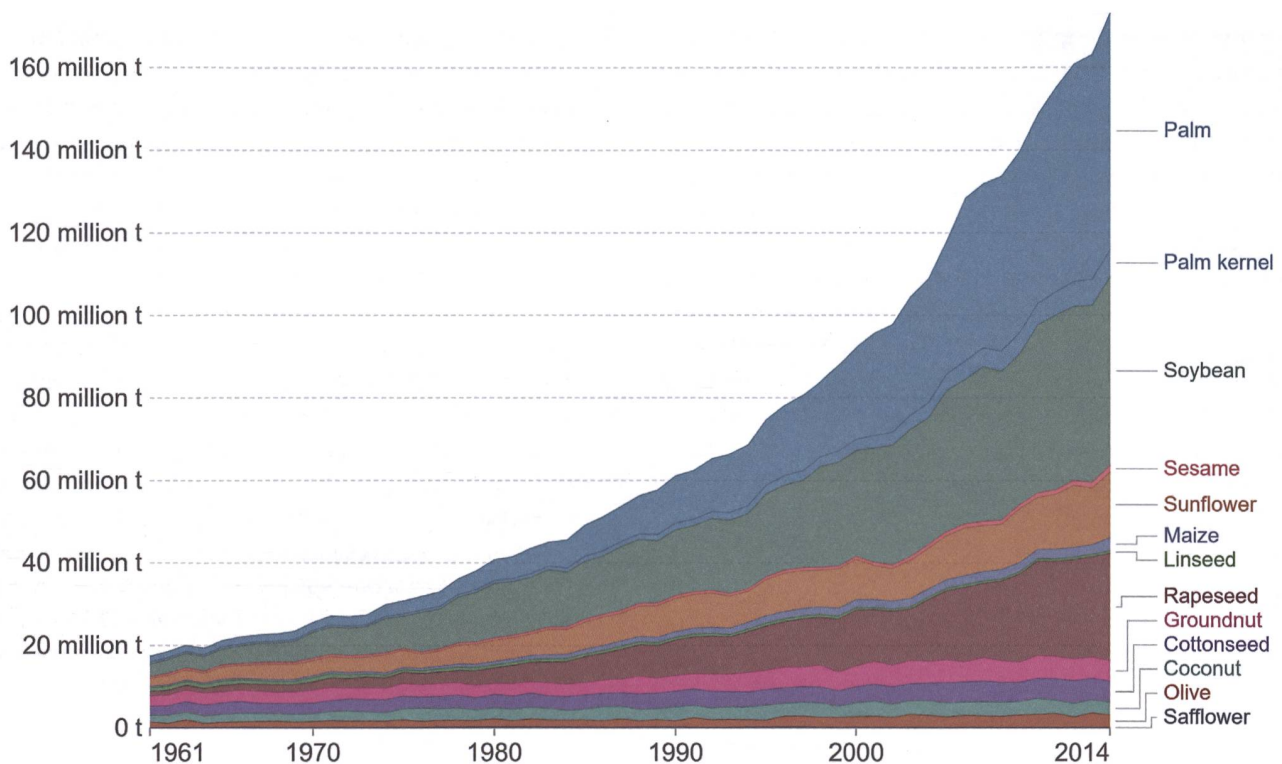
- (3) Economic, social and environmental sustainability: Resource chains are fluid and imperfect constructions, both creating and being subject to variability, vulnerability and change. Consequences for local societies and environments and for the persistence of resource chains, as well as the political, technological, social and legal responses to it, require more systematic and comprehensive analysis.¹²

We consider global resource chains as (neo-) imperial constructions and are aware that western academic disciplines remain problematic tools for seeking understanding of the power relations inscribed by colonial discourses.¹³ Developing an appropriate language and framework requires critical, reflective approaches through collaborative work with researchers from the Global South and a balance of sources, voices and discourses from the Global North and the Global South. In this article, I will provide a short outline of the global Danish oil complex by focusing on the main companies Aarhus Oliefabrik (AO) and United Plantations (UP).

The global Danish plant oil complex

An example of global resource chains that has only recently raised some more attention is the enormous rise of global plant oil production in plantations of palm oil, soybeans and other oil fruits in the Global South. Plant oil production soared from less than twenty million tons in 1960 to more than 160 million tons in 2014. The origins of global plant oil chains date back to the era of trade imperialism in the second half of the nineteenth century. Innovations in oil chemistry facilitated the engineering of plant oils and the development of oil industries producing new plant oil products such as margarine.¹⁴ While colonial powers like Britain and the Netherlands dominated plant oil production and trade, also Denmark, a comparably small country without colonial possessions in Southeast Asia at this time, developed a leading position in the oil industry and in global plantation activities in Southeast Asian countries. Business leaders and engineers established an expanding oil industry in the Danish city of Aarhus in the late-nineteenth century, which demanded rising amounts of global plant oil resources. At the same time, Danish adventurers in Siam (today Thailand) engaged in ambitious technological projects and invested in the development of large tropical plantations in Siam, Malaysia and other countries.

Aarhus Palmekærnefabrik, established in 1871 and renamed Aarhus Oliefabrik in 1892, focused on the production of vegetable oils, e.g. as a basis for margarine. It represented a major player in a network of Aarhus-based fat and oil companies.¹⁵ In the late nineteenth century, AO established a research laboratory for experimenting with a large range of different tropical oil seeds and fruits to develop new products and production processes. The research laboratory helped develop refinery processes to



1 World vegetable oil production from 1960 to 2014.

change the composition, consistency, smell and taste of oils and fats. Its most important products became basic oil products called NEUTREX and CEBES, which served as primary products for the production of oil and fat consumer products such as margarine.¹⁶

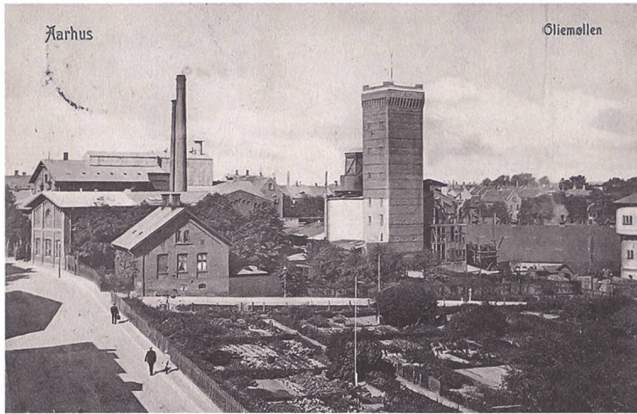
Denmark, a comparably small country without colonial possessions in Southeast Asia at this time, developed a leading position in the oil industry and in global plantation activities in Southeast Asian countries.

AO processed and experimented with a large range of different oil plants, most of which had to be imported from tropical countries, such as sesame seeds, peanuts, kopra (coconut), palm kernels, palm fruit, shea nuts etc.¹⁷ To secure a steady flow of tropical oil resources, the company started shortly after the turn of the century to establish trade stations in Africa and the Far East (e.g. in Ceylon, Singapore, Malaya, Indonesia, Cameroon, British Senegambia, Belgian Congo, and Portuguese Guinea), but also in trade centers such as London, New York and Sidney. In addition, from 1918 it started to invest heavily into its own plantations in Sumatra and Malaya.¹⁸ In Sumatra, the company founded the Dansk Ostindisk Plantage Selskab, which acquired a concession for 12,000 hectares for palm

oil trees and rubber trees. On one plantation (Telok Pandjie), forest clearing started in 1918 with a workforce of several hundred men from Malaya and Java.¹⁹

In 1911, AO had become the largest oil producer in Scandinavia and one of the largest oil companies worldwide. A new large extraction and refining facility at the harbor of Aarhus was projected and started to produce 100 tons of oil per day in 1925, but with soya as a new raw material it quickly reached 120 tons per day. In the mid-1930s, with the export of oils and feeding materials, Aarhus Olie represented ten percent of exported Danish industrial products. In 1937, the Danish oil industry was the country's largest export industry with a share of 22 percent of total exports to 75 countries. For Aarhus, the oil industry was essential. It occupied a staff of 1,283 people and created about ten percent of income of the larger Aarhus area.²⁰ By World War II, Denmark had become the largest importer of coconut kernels and the third largest importer of palm oil kernels as major plant oil resources from Malaysia.²¹

In the same period from the late nineteenth century, Danish pioneers and businessmen developed a strong presence in Southeast Asia, first in Siam. Siam was the only state in the region that remained independent, but it faced strong pressures from the colonial powers surrounding it, notably France and Britain. In this situation, the King of Siam, Chulalongkorn, embarked on a comprehensive modernization policy with the support of Danish experts, administrators and investors. The Danish naval



2 Postcard of Aarhus Oliefabrik, 1905.



3 Laboratory of Aarhus Oliefabrik in the mid-1930s.

officer Andreas de Plessis Richelieu, who came to Siam in 1875, made a remarkable career as commander, admiral and minister of the Siamese navy. He attracted many more Danes to the country, who occupied many positions from simple seamen to high-level administrators. As citizens of neutral European states, which posed no imperial threat to Siam, King Chulalongkorn was particularly welcoming of Scandinavians.²²

One of the Danish emigrants was the engineer Aage Westenholz, who arrived in Siam in 1885 at the age of 26. Westenholz became a versatile businessman and acted as an extremely successful system builder within Bangkok's nascent transportation, electricity and building industries. In addition, he started investing in plantations in Siam for tobacco and rice production. After the turn of the century, plantations became his main interest. The clearing of tropical forest and building of new plantations became a big business in tropical Southeast Asia, particularly Indonesia and Malaysia. In 1906, Westenholz bought his first pieces of land, a few hundred hectares of uncultivated tropical forest in Perak, Malaya, then a British protectorate, and founded the Jendarata Rubber Company. To profit from the rubber boom, he first planted rubber trees, but soon started to diversify into coconut palms for oil production. Coconut palms became an important oil plant, with the coconut hacked into smaller pieces and dried to become saleable copra, the raw material for extracting coconut oil. In 1917, Westenholz reorganized his plantations and founded the company United Plantations (UP).²³

During the 1920s, Westenholz and his manager on the plantation since 1910 (and brother-in-law), the Swedish Commander William Lennart Grut, started to experiment with a new oil plant, the oil palm. Dutch scientists first imported and bred a variant of the African oil palm to Indonesia in the mid-nineteenth century, but Dutch and British attempts to develop commercial oil palm plantations initially proved disappointing due to high costs and deficient markets.²⁴ In 1927, Grut planted the first 250

hectares of oil palms successfully. Oil palms proved less fragile than rubber trees and ideal for the climate, and promised to be a profitable diversification from rubber at the end of the rubber boom. Soon they became a focus of UP. With improved planting materials and mill-based processing machinery, the palm oil industries offered substantial economies of scale from about 1940. UP built a small oil factory to process oil fruits during the 1930s, which after the war expanded significantly to become an oil refinery complex located at the navigable Bernam river adjacent to UP's plantations. While almost all palm oil was refined in Europe before 1970, UP was one of the pioneers that broke that pattern. In the 1960s, UP also bought its own oil tanker to ship freshly pressed palm oil to the next bigger harbors for further export.²⁵

Oil palms proved less fragile than rubber trees and ideal for the climate, and promised to be a profitable diversification from rubber at the end of the rubber boom.

Westenholz employed European plantation managers to lead the plantations, until 1978 only members of his family, first his brother-in-law Lennart Grut, and later Lennart's sons Rolf and Olof Grut.²⁶ They directed an increasingly large workforce in clearing tropical forest, planting trees, maintaining the estate, harvesting and processing fruits and producing and exporting palm oil. In Malaysia, from the beginning of the plantation business, the workforce consisted mostly of Tamil laborers. The bulk of Tamil Malaysian migration began during the British Raj, when Britain facilitated the migration of Indian workers to work in plantations. Today more than five percent of the population in the multiethnic state of Malaysia are of Tamil origin (22 percent are of Chinese origin). Both Tamil men



4 Clearing of tropical forest on the plantation Telok Pandjie in Sumatra, 1918.

and women worked at the United Plantation estates. While a “plantation complex” represented a hierarchical political system that mobilized and exploited labor, Westenholz and subsequent leaders of UP put emphasis on comparably high welfare standards for their workforce within the conventions of the time, which was inspired by the Danish ideals of the Folk High School and co-operative movements.²⁷ The company built simple houses for its laborers as well as schools, hospitals and temples. Tamils covered all major daily work tasks as well as special jobs from building roads to fighting pests and animals. In a long war against thousands of rats in the late 1920s and early 1930s, in which sheltering young plants and the massive use of poison and cats failed, systematic hunting gangs of Tamil laborers proved the most effective means. In addition, ants, caterpillars, elephants and crocodiles repeatedly caused major problems and work.²⁸

Cooperation in crisis:

United Plantations and Aarhus Oliefabrik

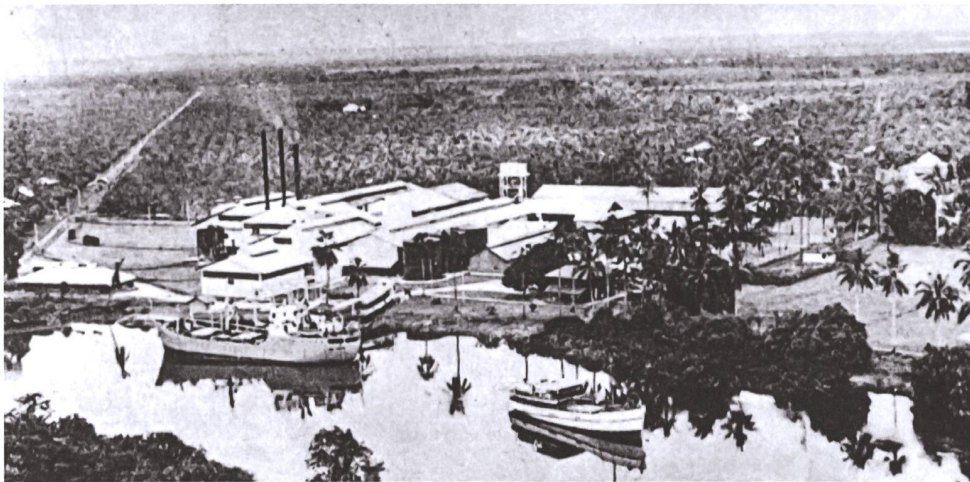
United Plantations’ Scandinavian managers and its board in Copenhagen succeeded in difficult times to keep the company and its plantations in Danish hands, such as during the Japanese occupation of British Malaya in World War II and after national independence and the foundation of Malaysia. The Malayan states claimed independence from Britain in 1957 as the Federation of Malaya and formed the unified state of Malaysia in 1963. Plantation business represented an important economic pillar of the young country and expanded with rising global demand of tropical products. In contrast to other decolonized states, Malaysia did not initially pursue a policy of nationalization of foreign possessions in Malaysia, but accepted foreign ownership. In the wake of fierce revolts by Chinese minorities against the Malay majority in 1969, the Malaysian government adopted a nationalist stance. From the 1970s, Malaysia’s New Economic Policy aimed to reduce the

share of foreign ownership in Malaysia to 30 percent by 1990 in order to strengthen Malay possession and development. This policy led to a full nationalization of the largest British plantations in Malaysia within the following two decades.²⁹

From the 1970s, Malaysia’s New Economic Policy aimed to reduce the share of foreign ownership in Malaysia to 30 percent by 1990 in order to strengthen Malay possession and development.

One of the leading Danish managers of UP in Malaysia, Børge Bek-Nielsen, who had joined the company and moved to Malaysia in 1951, realized early the political changes ahead and prepared for them in order to avert an expropriation of the company. From the early 1970s, he aimed to diversify ownership of UP in agreement with demands of the Malaysian government, and combined this requirement with a strategic move. UP sought a close cooperation with the plant oil industry in Denmark and started negotiations with Aarhus Oliefabrik as the most promising candidate. AO had run into economically very difficult years. Denmark joined the European Community in 1973. The open market and loss of trade barriers put the company under significant pressure. It had profited significantly from Danish tariffs and now suffered strong competition from foreign competitors. UP aimed to take advantage of that situation. As it had to sell stocks, it also had to look for new investments with the incoming capital. The solution was a cross bargain of stocks of UP and AO, leading to a mutual cross-ownership of both companies, the so-called Aarhus Alliance. This cooperation initiated a long-term close relationship between both companies.³⁰

This model helped UP to stabilize its exports to AO. At the same time, it helped AO to profit from the inter-



5 UP palm oil factory with tanker in 1963.

national relations of UP in finding new export opportunities for their products. Bek-Nielsen, now sitting on the board of AO, had great influence in the company's export strategies, for example by creating an export platform in England with the help of significant investments into and joint ownership of the company Anglia Oils in Hull, England, which processed basic oil products based on palm oil into high-quality consumer products for the British market. In the 1990s, AO invested significant capital into and became joint-owner of UP's oil refinery UNITATA in Malaysia, which UP had built for the development and production of higher-value specialty fats aimed at Asian and Western markets. In joint efforts AO and UP systematically continued to open and serve new markets on the globe.³¹ In 2005, AO merged with the Swedish company Karlshamn AB. Under the name AarhusKarlshamn AB (AAK) with headquarters in Malmö, Sweden, it has today production facilities in 19 countries across the globe and a total of almost 4,000 employees. Today the UP Group operates 51,000 hectares of palm oil plantations in Malaysia and Indonesia and two refineries in Malaysia. It employs more than 6,000 people, about 4,600 in Malaysia and 1,200 in Indonesia.³²

Outlook

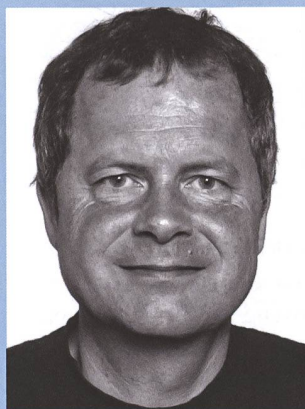
Tropical plantation business has significantly transformed both colonial spaces in the Global South and metropolitan spaces in Europe. New tropical resources sparked innovation as well as new consumption habits in Europe. At the same time, resource extraction in tropical countries caused deep social and environmental transformations. Comprehensive histories of the global Danish oil complex, which connect the tropical and metropolitan spaces and include the economic, social and environmental impacts of global plant oil chains, are still lacking. Available historical research covering Aarhus Oliefabrik and United Plantations and its global activities only cover business history

approaches and European sources and perspectives. These accounts produce narratives of heroic pioneers, successful builders and Danish exceptionalism represented by able Danish leaders and a cooperative and welfare-oriented Danish work culture. The focus on Danish sources and on interviews with the main Danish actors has strongly reinforced this perspective, as for example in the case of UP. We know strikingly little about the global activities of AO or the relations and perspectives of Malaysian actors and populations to UP, as well as about local understandings of the impacts of both companies on tropical societies and environments. The inclusion of sources, voices and perspectives from the Global South remains a task for future historical research.

A more detailed investigation of the global Danish plant oil complex and its resource chains promises to uncover the cultural complexities of building global resource chains. The example of actors from a small country and in comparison small or medium-sized companies taking a stake in tropical resources raises the questions of the repertoires of power they commanded in pursuing business interests in the tropics. The lack of colonial rule, military power and economic dominance in comparison to actors from colonial empires such as Britain, France or the Netherlands demanded stronger emphasis on alternative means of interest politics vis-à-vis colonial and local actors. These repertoires of power included networking and diplomacy, the forging of alliances, collaboration, openness and empathy with regard to local cultures, and the development of strong capacities in science, technology and innovation. Likewise, the other side of this coin, the social, economic and environmental consequences of Danish activities in the tropics, the dispossession and displacement of peasants and smallholders, mass immigration of foreign workers, the creation of economic (path-) dependencies, the deep transformations of rural life and culture and the deforestation, mono-cropping and environmental devastation and change deserve due attention.

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Annotations

- 1 Edward Barbier, *Scarcity and Frontiers: How Economies Have Developed through Natural Resource Exploitation*, Cambridge, UK, 2011. Michael. T. Klare, *The Race for What's Left: The Global Scramble for the World's Last Resources*. New York 2012.
- 2 K. S. Jomo (ed.), *The Great Divergence: Hegemony, Uneven Development, and Global Inequality*, New Delhi 2005. Corey Ross, *Ecology and Power in the Age of Empire: Europe and the Transformation of the Tropical World*, Oxford 2017.
- 3 Numbers are based on European Environmental Agency, Infographic EU animal feed imports and land dependency, INF-78, 23 Nov. 2020. www.eea.europa.eu/media/infographics/eu-animal-feed-imports-and-1/view (Accessed on 23 December 2021).
- 4 Brad Plumer, You've Heard of Outsourced Jobs, but Outsourced Pollution? It's Real, and Tough to Tally Up, *The New York Times*, September 4, 2018. www.nytimes.com/2018/09/04/climate/outsourcing-carbon-emissions.html (Accessed on 23 December 2021).
- 5 Erik van der Vleuten, History and Technology in an Age of "Grand Challenges": Raising Questions, in: *Technology and Culture* 61 (2020), p. 260–271.
- 6 Other focus areas are Resource Perceptions and Constructions of Scarcity and Resource Security and the Limits of Expert Knowledge. Matthias Heymann, Per Högselius, Elena Kochetkova, John Martin, Ole Sparenberg, Frank Veraart, Anna Åberg, *Challenging Europe: Technology, Environment, and the Quest for Resource Security*, *Forum Grand Challenges*, in: *Technology and Culture* 61 (2020), p. 282–294.
- 7 Donna Haraway, Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin, *Environmental Humanities*, 6 (2015), p. 159–165. Noburu Ishikawa, Into a New Epoch: Capitalist Nature in the Plantationocene, in Noburu Ishikawa and R. Soda (eds.), *Anthropogenic Tropical Forests: Human–nature Interfaces on the Plantation Frontier*, Singapore, 2020, p. 589–594. The phrase "factories in the fields" was coined by Carey McWilliams, *Factories in the Field, The Story of Migratory Farm Labor in California*, Berkeley 2000.
- 8 Miles Kenney-Lazar, Noboru Ishikawa, Mega-Plantations in Southeast Asia: Landscapes of Displacement, in: *Environment and Society* 10 (2019), p. 63–82, here p. 63.
- 9 Heymann et al. (see n. 6).
- 10 H. Hazel Hahn (ed.), *Cross-Cultural Exchange and the Colonial Imaginary: Global Encounters via Southeast Asia*. Singapore 2020.

- 11 Jane Burbank, Frederick Cooper, *Empires in World History: Power and the Politics of Difference*, Princeton 2010. Jürgen Osterhammel, *Colonialism: A Theoretical Overview*, Princeton 1997. Anna Lowenhaupt Tsing, *Friction: An Ethnography of Global Connection*, Princeton 2011.
- 12 Tom Kuhlman, John Farrington, What Is Sustainability, in: *Sustainability* 2 (2010), p. 3436–3448. Jeremy Caradonna (ed.), *Routledge Handbook of the History of Sustainability*, New York 2018.
- 13 Dipesh Chakrabarty, *Provincializing Europe: Postcolonial Thought and Historical Difference*, Princeton, NJ, 2000. Diana Brydon, Peter Forsgren and Gunlög Fur (eds.), *Concurrent Imaginaries, Postcolonial Worlds: Toward Revised Histories*, Leiden 2017.
- 14 Jonathan E. Robins, *Oil Palm: A Global History*, Chapel Hill, NC, 2021. Jonathan E. Robins, *Oil Boom: Agriculture, Chemistry, and the Rise of Global Plant Fat Industries, ca. 1850–1920*, in: *Journal of World History* 29 (2018), p. 313–342. Valeria Giacomini, *The Emergence of an Export Cluster: Traders and Palm Oil in Early Twentieth-Century Southeast Asia*, in: *Enterprise and Society* 19 (2017), p. 272–308.
- 15 Poul Kragelund, *Aarhus Olie, 1871–1996*, Aarhus 1996. Jesper Strandskov, Kurt Pedersen, Peder Sørensen, *Pioneren Otto Mønsted*, Aarhus 1998.
- 16 Kragelund (see n. 15), p. 17–20.
- 17 Ibid., p. 62–63.
- 18 Erik Helmer Pedersen, *Pionererne*, Copenhagen 1986, p. 254–261. Kragelund (see n. 15), p. 41.
- 19 Per Boje, *Boje, Danmark og multinationale virksomheder før 1950*, Odense 2000, p. 45.
- 20 Kragelund (see n. 15), p. 47, 67–68.
- 21 Geoffrey Kevin Pakiam, *Smallholder Involvement in Tree Crops in Malaya, with Special Reference to Oil and Coconut Palms in Johor, 1862–1963*, PhD thesis, University of London, 2017, p. 325–326.
- 22 Tage Kaarsted, *Admiralen, Andreas de Richelieu, Forretningsmand og politiker i Siam og Danmark*, Odense 1991. Susan M. Martin, *The UP Saga*, Copenhagen 2003, p. 17–18.
- 23 Martin (see n. 22), p. 22–39. Pedersen (see n. 18), p. 114–122.
- 24 Jonathan E. Robins, *Shallow Roots: The Early Oil Palm Industry in Southeast Asia, 1848–1940*, in: *Journal of Southeast Asian Studies* 51 (2020), p. 538–560.
- 25 Martin (see n. 22), p. 54–71, 183–185, 325.
- 26 Ibid., p. 170.
- 27 Robins (see n. 14), p. 144. Martin (see n. 22), p. 3, 12.
- 28 Martin (see n. 22), p. 60–61.
- 29 Shakila Yakob, Nicholas J. White, *The “Unfinished Business” of Malaysia’s Decolonisation: The Origins of the Guthrie “Dawn Raid,”* in: *Modern Asian Studies* 44 (2010), p. 919–960. Tim N. Harper, *The End of Empire and the Making of Malaya*, Cambridge 1999, Chapter 9.
- 30 Martin (see n. 22), p. 264–276. Kragelund (see n. 15), p. 171–178.
- 31 Kragelund (see n. 15), p. 185–188 and 216–218.
- 32 For AAK see: <https://da.wikipedia.org/wiki/AarhusKarlshamn>, [https://en.wikipedia.org/wiki/AAK_\(company\)](https://en.wikipedia.org/wiki/AAK_(company)) and www.aak.com/about-AAK/. For UP see: <https://unitedplantations.com/overview/> (Accessed on 23 December 2021).

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- 1 Our World in Data, website: https://ourworldindata.org/grapher/vegetable-oil-production?country=~OWID_WRL, UN Food and Agriculture Organization (FAO), CC BY
- 2 Jesper Strandskov, Kurt Pedersen, Peder Sørensen, *Pioneren Otto Mønsted*, Aarhus 1998, p. 61.
- 3 Poul Kragelund, *Aarhus Olie, 1871–1996*, Aarhus 1996, p. 77.
- 4 Arne Hendrichsen, website: www.arnehendrichsen.dk/2019/02/10/plantagen-telok-pandjie/ (Accessed on 23 December 2021).
- 5 Martin (see n. 22), p. 184.