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Vol. 44 No. 12 · 23 June 2022

The Irreplaceable Bee Wilson



PLANET PALM: HOW PALM OIL ENDED UP IN EVERYTHING – AND ENDANGERED THE WORLD by Jocelyn C. Zuckerman.

Hurst, 337 pp., £20, May 2021, 978 1 78738 378 4

OIL PALM: A GLOBAL HISTORY by Jonathan E. Robins. North Carolina, 418 pp., £32.95, July 2021, 978 1 4696 6289 3

Substitutes for pricier substances (quartz for granite, polyester for cotton). And then there are shape-shifting commodities. One of the most protean is refined palm oil, which can be edible or inedible, liquid or solid, savoury or sweet, for industrial or domestic use. In current agricultural jargon, it's a 'flex crop'. Around 1921, an American chemist marvelled at the ability of vegetable oils to transmute 'into all sorts of substances useful to man' and predicted that they would soon be seen as 'of greater importance to the human race than the great steel and iron industries'. The remark was all the more prescient given that this chemist had never rubbed shower gel over his body or shaved his beard with squirty shaving foam (many skincare products get their foaminess from palm oil). He had never poured non-dairy creamer into his morning tea or eaten supermarket cookies. He had never travelled in a vehicle powered by biofuel or reheated a frozen pizza on a Friday night. He praised industrial vegetable oils yet had never tasted Nutella.

In 1914 William Lever decided to diversify his palm oil empire. Margarine, he thought, had the potential to be a much bigger market than soap, because consumers would always be willing to spend more on feeding themselves than on washing. In the 1880s, Lever and his brother James – the children of a grocer from Bolton – had created Sunlight soap, one of the biggest brands in late Victorian England. The breakthrough wasn't the soap itself, but the way it was marketed: in individual bars packaged in colourful boxes, rather than in giant slabs sliced off by the pound in grocery shops. To give it the right amount of lather, Sunlight was 41.9 per cent palm kernel oil. By the 1890s, Lever Brothers were selling 2400 tons of Sunlight soap per week, churned out at their factory in Warrington along with Lux Flakes and Vim. But Lever still felt jealous of the people he called 'Butterine makers'. He often had to compete for raw materials with margarine manufacturers and finally decided that the best course of action was to join them. A civil servant who had dealings with Lever observed that at first glance he seemed 'a rather insignificant little fellow', but soon decided he 'had never met a man who was so obviously a megalomaniac'. During the First World War, British margarine production, led by Lever, increased from 78,000 to 238,000 tons a year. In 1929, four years after his death, Lever Brothers merged with the Margarine Union to

form the consumer goods giant Unilever, many of whose flagship products, from Dove soap to Pot Noodle, are still based on palm oil.

Palm oil is the most widely consumed fat on the planet, far ahead of other vegetable oils such as soy, sunflower, peanut, coconut or rapeseed (not to mention animal fats such as lard and butter). But in its early days as an industrial product in the 19th century, it was uncertain whether palm oil would gain wide currency as a food in the West (it had long been produced and used in Africa). The closest the average Victorian came to palm oil as a foodstuff was its use as a coating to stop the tin used for canned food oxidising. As Jonathan Robins notes in Oil Palm: A Global History, 'few people in the industrialised world ate much palm oil until the 1920s.' In the United States, it wasn't officially recognised as a food until 1930 (dairy farmers had fought hard against the new 'oleomargarine' industry).

In the US and the UK, palm oil seemed unappetising because, as Robins writes, 'palm oil grease was a highly visible and smellable part of the experience' on steam railways. At every stop, a man walked down both sides of the train carrying a grease box and a wooden knife, and smeared lumps of grease (made from a mixture of palm and tallow) on the wheels. Anyone who had witnessed and smelled this ritual – or seen the rats feasting on the leftover contents of the grease boxes – might not feel all that keen to spread palm oil margarine on their bread. Nevertheless, it soon became a staple of the British diet, unrecognisable because the refined version had no smell and virtually no taste.

It isn't always the most delicious foods that become the most valuable commodities; there is also value in blandness if the texture is right. Odourless, colourless and tasteless foods can be used in the widest range of products without advertising their presence. As Robins says, 'No one ever bought a stick of palmitin or a jar of diglycerides in a supermarket [both palm oil derivatives], but they ate them nonetheless in packaged foods.' On the face of it, the idea of palm oil as flavourless and colourless is odd. In the countries where it is loved for its own sake, palm oil is known for its intense colour and flavour. When the Venetian explorer Cadamosto encountered it in Senegal in the 15th century, he wrote that it had the 'scent of violets, the taste of our olive oil and a colour which tinges the food like saffron, but is more attractive'. Red palm oil is a pungent and deeply coloured oil with an aroma somewhere between flowers and root vegetables (when it arrived in Malaysia, some colonials compared its scent to floor polish). In Bahia in Brazil it is known as dendê oil and is used to lend its colour and perfume to anything from coconutty fish stews to farofa (a toasted cassava mixture that is a bit like couscous). When I first cooked with palm oil – to make a Nkrakra chicken soup from Zoe's Ghana Kitchen by Zoe Adjonyoh – I was stunned by how aromatic it was. As I heated the red oil in the pan, the whole kitchen filled with a smoky-sweet aroma before I had added a single spice. A little oil dripped from my measuring spoon onto the floor, where it left an orange mark.

But perhaps you haven't cooked with palm oil. Despite its ubiquity in processed foods, it's quite hard to buy in the UK. Search for it in an online supermarket and you will generally be offered foods that advertise their virtuous lack of it — more than 1800 products on Ocado. You will find giant plastic bottles of viscous red palm oil at an African or Caribbean grocer's, and in health-food shops expensive jars of unrefined organic palm oil are sold as a superfood. In very large branches of Tesco you sometimes find two-litre bottles of Mother Africa Pure Red Palm Oil from Nigeria and Sainsbury's stocks tiny bottles of a red palm and rapeseed blend made by a health-food brand called Carotino. But that's it.

The oil palm grew in the floodplains and swamps of Africa millions of years before the existence of humans. Excavations in the Bosumpra Cave in Ghana show that people have been consuming

some version of its oil for five thousand years. It is still produced across West Africa by small-scale farmers just as it has been for centuries. To harvest the palm, you shimmy up the tree and cut down vast bunches of the red plum-sized fruit with a machete. Palm-harvesters are almost always men, although there is a town in Nigeria where unmarried women and widows also climb the trees. The fruits are then sweated under a mat and boiled to soften them before being crushed to extract the colourful oil. The fruits yield two separate oils: one from the fleshy orange-coloured pulp and another from the inner kernel, a milder substance known as palm-kernel oil. The sap of the palm is used to make palm wine, which the culinary historian Jessica Harris says 'has the kick of the proverbial country mule and becomes western Africa's form of white lightning'. As well as using palm oil in cooking, Africans use it as an ointment, a medicine, a soap and as lamp oil. This red palm oil was known in England in the 17th century, where it was used to rub on chilblains and swollen limbs.

It was the candle industry that first found ways to process African palm oil into something odourless and white. Until this development, three main substances were used for candles in Britain and all had significant flaws. Loveliest by far – both for their light and smell – were beeswax candles, but they were far too expensive for everyday use. Tallow candles were much cheaper but tended to sputter messily and leave a nasty meaty smell in a room. Spermaceti candles made from a kind of wax harvested from sperm whales were of much better quality but cost twice as much. In the 1850s, Price's Patent Candle Company (PPCC) found a way to make palm oil candles that were white and didn't smell, even when the raw oil was rancid. The candles were named Belmont Sperm – a link to the expensive spermaceti candles, though palm oil was even cheaper than tallow. The secret to odourless palm oil was to use acid and heat to break it down into components including stearic acid, palmitic acid, oleic acid and glycerine. Early attempts to process it into a substance suitable for candles hadn't been successful. One of the first processing agents used was arsenic, which led to fears that the 'corpse candles' would poison the room as they burned. In 1836, an arsenic-free way to extract the stearic acid from palm oil was developed, but the resulting candles were discoloured by the processing. PPCC used sulphuric acid to create spotlessly white palm candles. Then in the 1880s Loder, a British firm, patented a deodorising process for palm kernel oil that produced a neutral substance which could be used in margarine or as the fat in baked goods. The process stripped the oil of its vitamins as well as its strong scent. Pretty much all palm oil consumed in the world now is RBD: refined, bleached and deodorised.

The ADVERTISING for Price's candles co-opted the language of antislavery, foreshadowing the way palm oil was later positioned as a healthy alternative to trans fats and, in the form of 'green' biofuel, as an ethical alternative to fossil fuels. It has also been used to create detergents advertised as being 'plant-based', 'environmentally friendly' and 'natural'. The marketing of Price's candles was, according to Robins, one of the most famous campaigns in Victorian Britain:

PPCC eagerly adopted the rhetoric of 'legitimate commerce' and antislavery to promote its new palmitic acid candles. 'Every candle of 'em that's burnt helps to put out a slave,' quipped one writer. British merchants pointed out that American spermaceti and 'adamantine' candles (the latter infringing on PPCC's patents) were staples in the illegal slave trade; perhaps 150 million candles were swapped for African captives between 1807 and 1865. One not-at-all-subtle advertisement featured an aproned candle maker surrounded by moulds handing an African a liberty cap. At the same time, he burns away the rope holding the African in bondage with a palmitic candle.

The idea that Europeans buying palm oil would help to free labour in Africa turned out to be a cruel joke. The life of a palm cutter had never been easy or risk-free – each bunch can weigh as

much as a hundred pounds and they are found high above the ground – but under European colonial rule the work became exponentially harder and more unpleasant.

The brutal and exploitative way Lever secured access to oil palms in the Belgian Congo set the pattern for the modern palm oil industry. In 1911, he signed a contract for 1.8 million acres of oil palm land. It is astonishing that Unilever still bears the name of a man who wrote in a letter to one of the company directors that 'it is a well-known fact that the brain of the African ceases to be capable of receiving new impressions when he arrives at the adult stage.' He called his palm oil settlement Leverville and said that the palm groves there were 'the grandest sight I have ever seen in any part of the world'. But it wasn't a grand life for the Congolese who worked there. Like other foreign palm oil magnates, Lever turned the wild palm groves of Africa into sterile plantations, which were managed by a new company he created: Huileries Congo Belge or HCB. When Sidney Edkins arrived to work there in 1911, he found that 'hardly a village was to be seen' in the region because forced labour 'had practically exterminated the existing population for a distance of fifty miles either side of the track'. In 1915, one HCB official admitted that most of the workforce of Leverville consisted of slaves who were handed a workbook, a machete and a blanket and set to work. It was said that few men would choose to work there, especially given the harsh way they were treated by the company bosses, who demanded that strict targets be met whatever the season. Many of the workers were teenagers and children who pushed wagons or loaded the palm fruit onto boats.

The colonial experiments with palm oil in Africa were a failure, Robins explains, partly because of African resistance to European control and partly because the Africans understood the needs of the plant far better than the Europeans. Some of the supposed efficiencies brought in by European producers were unpopular and others were counterproductive. Studies showed that the HCBmanaged groves didn't produce higher yields than the natural palm groves managed by African farmers. HCB's farming methods took no account of the need for crop rotation and a fallow period to keep the soil fertile. As Robins writes, 'Europe's obsession with economy meant remaking every hectare to push yields as high as possible; but Africans adapted to the land to maximise the output of their labour.' The Europeans didn't appreciate that palm oil production was already embedded in everyday life. When oil presses arrived in Nigeria in the 1920s, women, who had always pressed the oil by hand, organised to resist them, trying to stop oil press operators from buying palm fruit in the markets. Robins notes that 'men could machine press a gallon of oil in 1.5 hours, while a woman took 3.5 hours to make a gallon by hand,' but in a sense it is a false comparison since the women could weave the job of pressing oil into their 'household routines'. Another argument between Europeans and Africans was over the manufacture of palm wine. British officials tried to ban the felling of palms for wine, but this had little impact since palm wine was worth more at local prices. Finally, the biggest flaw of all in European attempts to make a fortune from African palm oil was that they were always in competition with domestic consumption. In the late 1930s 65 per cent of palm oil produced in Nigeria was consumed by Nigerians.

The vast global success of palm oil came when the industry was transplanted to Asia, where there was no tradition of its cultivation or consumption. It was in Asia that tenera palm became the dominant variety grown. First identified by German botanists in Cameroon, its fruit yielded a much higher percentage of oil (50 per cent by weight compared to 15 per cent for the dura oil palms favoured in Africa). Oil palm plantations spread across Malaya and Sumatra in the 1920s, but the truly colossal growth began in the 1970s, first in Malaysia and then in Indonesia. In 1970, a hundred thousand hectares were given over to palm oil in Indonesia; by 2015, this had increased to ten million. One of the key factors driving the growth of palm oil production in Indonesia was half a billion dollars in investment from the World Bank (the main beneficiaries of these dollars were President Suharto and his cronies). Robins, appearing on the podcast Gastropod, remarked that for

the World Bank, palm oil production in Indonesia was a 'twofer': it seemed to be the perfect way to address poverty and feed the local population while also boosting the economy through export income. According to one report from the bank, the two resources that made Indonesia ideal for palm oil were 'Javanese labour and unexploited land on the other islands'. Unexploited land is a euphemism for Indonesia's virgin rainforest, more than half of which has now been razed for plantations. Until the 1970s, Indonesians themselves didn't use much palm oil, but by 2010 it made up 94 per cent of the cooking oil sold there.

Over the past fifty years, vegetable oils have contributed more calories to the world's diet than any other category of food, and palm more than any other kind of oil. Around 70 per cent of palm oil is used in ultra-processed foods manufactured by Unilever and its rivals. The human body needs fat, while the tongue (or brain, or stomach, or wherever you locate your deepest gustatory desires) craves it. Fat carries flavours like nothing else. Palm oil has been used to feed billions of people an ultra-processed diet richer and in some ways more enticing than the food their grandparents ate. The downside is that refined palm oil doesn't have much to offer nutritionally other than fat. In Robins's account, palm oil is the untold part of the story of the 'green revolution'. When we speak of feeding the world, we often think of grains, yet as Robins writes, 'since 1970, three times as much new cropland has been put under oil-producing plants than under grains.' Grains have filled the hungry bellies of the world, but palm oil has often been what made the grains palatable.

Palm oil is a fat that is half-saturated and semi-solid at room temperature. It can fry like lard, bake like butter, melt like chocolate and whip like cream – at a fraction of the cost. It can also extend the shelf-life of products like industrially produced cake and bread. But its USP is that it has for a long time been significantly cheaper and hugely more productive than any other oil crop. Plantation-grown palm oil produces significantly more fat per hectare than any other plant. To extract the same amount of oil from coconut palms, for example, would take ten times more land. At the time Jocelyn Zuckerman was writing her book, the price of palm oil was \$694 per metric ton, as against \$832 for sunflower oil, \$890 for rapeseed and \$1876 for groundnut. Palm oil first became cheaper than soybean oil – its main rival – in 1974 when there was a poor soybean harvest in the US and Brazil, and has extended its advantage since then.

Thanks to the focus on palm oil in Indonesia, worldwide production increased from five million tonnes in 1980 to 62 million tonnes in 2015. Zuckerman reckons that half the products for sale in US supermarkets contain palm oil in some form. Many of them are cleaning and laundry products or toiletries: anything from toothpaste to lipstick. Palm oil doesn't usually advertise its presence (an exception is Palmolive soap – the name was first used in 1898 when the idea of soap made from 'oil of palm' still had a certain glamour) but tends to appear in beauty products in the form of derivatives with such prefixes as palm-, stear-, laur- or glyc-. Outside the supermarket, much of the growth in production has been driven by the biofuel industry. Like other iterations of palm oil, palm biofuel started off promising to be a virtuous substitute but may end up being as damaging as the thing it has replaced. When people started talking about 'peak oil' in the 1990s, many countries invested heavily in palm-oil-based agrofuels in the belief that they would be a carbon neutral or even carbon sequestering source of energy. But their calculations didn't factor in the vast amounts of carbon released when peat is disturbed to make a new plantation.

Stronger than Zuckerman on economics and history and the sheer thinginess of this 'oily stuff', the way it has lathered in soap or flaked in pastry, all without consumers knowing it's there. Robins, whose research is so exciting that for a few weeks after reading his book I could hardly talk about anything else, documents the 'remarkable reversal' by which a crop native to Africa became one mainly produced in South-East Asia, so that Africa now 'imports ten times more palm oil than it exports'. Zuckerman's account is more emotive and tells you what it is actually like on an oil palm plantation in Malaysia: the child labour, the pesticide poisoning, the expectation that workers should do 14-hour days picking up loose palm fruits with no boots or gloves for almost no money, under the constant threat of harassment and violence.

Zuckerman documents the ways the palm oil lobby has spread misinformation about its product and fought any attempt to regulate the industry by branding its critics as 'eco-colonialists'. She quotes one South African public health expert who says that the tactics of the palm oil industry are 'substantially worse than anything I ever faced from the tobacco sector'. When Richard Walker, the managing director of the Iceland supermarket chain, announced his plans to eliminate palm oil from in-house products by the end of 2018, a series of ads put out by the industry smeared him as a rich man punishing the poor farmers of Malaysia, ignoring the fact that the men who run the palm oil industry 'rank among the wealthiest in all of South-East Asia'. Robert Kuok, the major investor in the palm oil company Wilmar International, has a net worth of \$11 billion, making him the richest man in Malaysia. Zuckerman tried to get an interview with the Malaysian minister for health but was warned by his press secretary: 'He can't talk about palm oil. He can talk about anything but that.'

The arrival of palm oil companies in Indonesia has created a hell of many circles, as recounted to Zuckerman by a British primatologist called Ian Singleton:

You've got a peat swamp area, it's primary forest, loads of biodiversity. It's full of fish and it's full of water. And you've got a few local communities that traditionally catch those fish, and it provides most of their protein. All the water supply for the local community is from that water table. And then you've got some people who actually consider they own bits of the land, because it was cleared by their great-grandparents, but they don't have any paperwork. So you get a company then from Jakarta or somewhere who comes in and just evicts everybody. 'Fuck off.' 'Hey, that's my land.' 'Paperwork? Sorry, mate.' So they're kicked off. And then the company offers such shitty wages that none of these people want to work for it. They don't like the company anyway; they've just been evicted. So then they get labour cheaper from offshore islands. And they come and live in shitty conditions. Then the company chops all the forest down. So you annihilate everything that lives there, including ants and termites and funguses. Incinerate the whole fucking thing. Then you dig canals, because in order to grow oil palm you need at least a metre of dry peat to plant the thing. And then the river levels go down, the fisheries disappear, so you've got all these people who used to make their living and water supplies, and protein source, all of a sudden have got fuck all. And they're surrounded by plantations. So even if they did have any money, they can't grow any vegetables or fruits ... And then some company – or some guy in Jakarta who's probably never been there – his bank account is going up and up and up, for 25 or thirty years.

In Indonesia alone, fifteen million acres of rainforest were destroyed for palm oil cultivation between 2000 and 2012, and this is only the start. Conservative projections suggest that demand for palm oil will at least double by 2050 (some estimates say it will quadruple). The Sumatran orangutan is critically endangered because its habitat has been destroyed for new plantations.

The rise of diabetes and obesity in India and Mexico, among other places, correlates with the huge increase of saturated palm oil in the diet, in the form of processed foods as well as in the cheapest cooking oils bought by people who can't afford any other fat. In countries like the US and the UK, where there is an increasing awareness of the environmental and health impacts of palm oil, multinational food companies are removing it from many of their products, but they're using more of it in Asia and South America. Crunchy Cheetos are a savoury fried snack manufactured by PepsiCo. The Cheetos sold in the US are fried in sunflower, corn and canola oils, but the ones sold in India are fried in palm oil and contain more than five grams of saturated fat per serving.

For the first time since the 19th century, the flow of palm oil around the world has slowed down. On 22 April, the Indonesian president, Joko Widodo, announced an export ban on palm oil. The policy was designed to bring down soaring domestic food prices in Indonesia in the wake of war in Ukraine, but the result will be a rise in food prices everywhere else. Palm oil is a staple commodity like wheat, whose price has a knock-on effect on the price of many other foods. In the wake of shortages of sunflower oil – Ukraine is the biggest exporter – the edible oil market had been relying on Indonesian palm oil even more than usual. In March, some European countries began to limit the amount of cooking oil customers could buy. The price of vegetable oil had already risen steeply over the past year because of droughts in South America, where much of the world's soybean oil is produced. One palm oil trader quoted on the Argus business information website said that 'Malaysia is the only winner' – it's the second biggest exporter of palm oil, accounting for around 31 per cent of global supply, as against 56 per cent from Indonesia. However, it isn't clear that Malaysia will be able to capitalise, given that palm oil yields there were down 3 per cent in 2020-21 because of an acute labour shortage caused by the pandemic.

The Indonesian export ban was reversed in May, but the world's dependence on palm oil was evident in the panic caused even by this brief disruption. It is the great substitute commodity and it isn't at all obvious what could replace it. The other cheap vegetable oils are all problematic in one way or another. Soybean oil production has resulted in deforestation in Brazil and the oil takes nearly ten times more land to produce, gram for gram. But then, as Robins writes, 'land is not a uniform thing. Ten hectares of rapeseed oil on the Canadian prairie presents a very different case – in terms of biodiversity as well as carbon emissions and social impacts – from one hectare of oil palm on a Borneo peat swamp.'

AN PALM OIL be produced in less destructive ways? It can, but boasts about 'sustainable palm oil' have until now mostly been greenwashing. In 2004, the Roundtable on Sustainable Palm Oil (RSPO) was set up. Representatives include the WWF, but as Zuckerman writes, 'twelve of its sixteen members represent palm oil processors, manufacturers, retailers, banks, investors and food-processing companies – which may explain why the organisation's progress has been so limited.' The group's annual meetings are 'splashy affairs' held in hotels in places like Bangkok and Kuala Lumpur, with 'breakout sessions, buffet lunches, cocktail hours', yet after seventeen years, it has certified only 19 per cent of global supply as sustainable – including oil used by Unilever, Nestlé, Colgate-Palmolive and others – and the criteria are very weak. The RSPO says it bans forest clearance, but a farm that has cleared land just before joining can still be classed as sustainable. It's almost impossible for a consumer to know whether the oil they are buying is sustainable or unsustainable. In 2019, Nestlé could only fully trace 62 per cent of its palm oil back to a specific producer. As Robins writes, 'unlike a product like coffee where variety and terroir serve as selling points, this industrial palm oil is a featureless commodity.'

Zuckerman and Robins both offer a few ideas for lessening the damage done by the oil. Zuckerman describes a synthetic palm oil made by a fermentation process similar to brewing beer, which apparently looks like 'an assemblage of golden-hued blobs', waxy and odourless. It is made by an American tech company called Xylome, which has also created a sustainable alternative to biofuels using corn stover (the waste husks left in the field after the corn is harvested). Nicole Kelleher, a 'beauty entrepreneur' and the daughter of the company's CEO, Tom, has calculated that replacing all the palm oil used in hair and skincare products with the synthetic alternative would save the equivalent in carbon of four million round-the-world flights a year. It would also move wealth back to the US and do nothing to address the fact that millions of Asian smallholders now rely on palm oil for their livelihoods.

Robins sees Thailand as a model for a more 'equitable' development of palm oil. Thailand is the world's third-largest producer, but in contrast to Indonesia and Malaysia, around three-quarters of the oil is produced by smallholders and the plantations are on average much smaller, less than a thousand hectares. Importantly, most of them weren't made by clearing rainforest and peatland but are on former rubber plantations. Dr Bronner's Magic Soaps, an organic soap company, has set up palm oil production in Ghana in order to control every aspect of the process. The company pays far above the market average for the oil and decided to leave some of the mill unmechanised to maximise paid human work (much of it done by women). Whether this model can be scaled up remains to be seen. As Robins writes, 'paying more for palm oil runs against the reason palm oil is in so many products: its cheapness.'

Cheap palm oil is part of an interlocking late capitalist system. When we say there is a demand for RBD palm oil, we mean there is a demand for instant noodles and foamy shampoo in plastic bottles and cheap ice cream all year round. Robins notes that campaigners tend to be more hostile towards palm oil than towards other tropical products such as cocoa and soy which also pose threats to ecosystems. He suggests that this hostility comes down to the fact that 'palm oil is perceived as being in things, rather than a thing in its own right.' Zuckerman's subtitle makes the same point: 'How Palm Oil Ended Up in Everything'. The suggestion is that 'everything' has been contaminated, but we might be OK if we replace the palm oil with something else, something better. That wouldn't be enough: it's the ultra-processed 'everything' that needs to change.





Listen to Bee Wilson discuss this piece with Thomas Jones on the LRB Podcast.

Letters

Vol. 44 No. 14 · 21 July 2022

Bee Wilson's illuminating piece on palm oil omits one major side effect of plantation development in Indonesia: the dense smog blown across the Strait of Malacca caused by the use of slash-and-burn methods to clear the land (LRB, 23 June). When I was in Singapore and Malaysia in September 2015, the air quality was so bad that people were instructed to wear masks and the schools were closed. Legislation is hampered, allegedly, because palm oil producers are quoted on the Singapore Stock Exchange.

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