

**TIMES
EVOKE**

**CAN SWEET DREAMS BE
MADE OF THESE?**

Who among us has not enjoyed the transient pleasures of a little sugar? A bite of biscuit, a slice of cake, even the simple act of stirring sugar into a cup of something warm, all these constitute a deeply individual moment, a tiny space of solitude in the hectic race of humanity. Worldwide, people enjoy a sugar rush which, they hope, passes — the global consumption of sugar crossed 178 million metric tons in 2024 — but, in fact, the impacts of sugar, and its sibling, chocolate, stay with us forever. Sugar's planetary history is remarkable. From being a locally grown product, it has expanded to 65 million acres worldwide, with a dozen countries using more than 25% of their arable land to grow it. Alongside cattle ranching, 80% of the Amazon rainforest has been cut down for growing sugarcane. Once planted, it takes 25 gallons of water to produce one pound of cane sugar — that's a mindboggling 34 litres per teaspoon. Meanwhile, the global chocolate market has caused the deforestation of vast stretches worldwide, cocoa decimating 2.3 million hectares just between 2001 to 2015. These industries further emit greenhouse gases, warming air, and release chemicals into land and water, harming ecology and species. Alongside, sugar and chocolate have bitter social histories. Both stem from pasts of enslavement, their global boom showing colonialism gleaming in the shiny wrappers of business. These transplanted entire families — in a bittersweet twist, the ancestors of VS Naipaul, the Indian-origin writer, were taken as indentured labour from Uttar Pradesh to Trinidad to grow sugar; perhaps then sprinkled over chic French pastry. Helpless child labourers still work in cocoa, over 1.5 million in Ivory Coast and Ghana alone, spraying pesticides and carrying sacks of goodies. Ironically, commodities which harm Earth and vulnerable communities finally catch up with everybody — many of the world's deadliest diseases, diabetes to cardiovascular illness, come from these.

Yet, there are solutions — and they don't mean plain-tasting lives. As Times Evoke's global experts emphasise, to manage a commodity optimally, awareness about it is crucial. As knowledge about these goods grows, emerging movements, from sustainable cocoa to fair trade sugar, seek better deals for producers, consumers and the planet. However, these efforts can only succeed if we enthusiastically track commodity trajectories. Join Times Evoke in exploring sweet dreams in their entirety — this can help save the world further bitterness.

'Mass-produced sugar came from chemicals, corruption — and environmental destruction'

David Singerman teaches history and American studies at the University of Virginia. Speaking to Srijana Mitra Das at Times Evoke, he outlines the long ark of sugar — and why this is so bitter-sweet:

What is the core of your research?

My work looks at the role science and technology have played in the modern global sugar industry. I am interested in how these relate to our ideas of what sugar is and how it should be valued. I've been researching the ways we started thinking of sugar as a chemical substance. It comes from plants like sugarcane and sugar beet — yet, the chemical substance of sugar, sucrose, is the molecule we think of as 'pure sugar'. This carbohydrate is extracted from diverse plants but the idea of molecules, chemicals, etc., is relatively modern — before the mid-19th century, when people thought of sugar, which has a history over 8,000 years, they imagined where it came from, how it tasted, how it felt crushed between their fingers, its medicinal properties, etc. Somehow, we moved from that world — where sugar was a very rich, deep, localised thing — to today where sugar is a bulk commodity, exactly the same everywhere, valued solely on its content of a chemical.

How did sugar go from being an elite luxury to a mass product?

In historical terms, sugar is as cheap today as it's ever been — its price has consistently fallen over the last 500 years. Yet, further centuries ago, sugar extracted from sugarcane was expensive — it wasn't considered a food staple like now but a condiment or medicine, something used in small quantities. It was a status symbol — if you could afford confections, that was a demonstration of your wealth.



BITTER: Sugar grew with unfree labour



BEYOND SYRUPY: One of the most lucrative industries on Earth, sugar also causes huge deforestation, water loss and planet-heating greenhouse gas emissions

The force that made sugar such a widely available item was its price being so high — that encouraged ruthless and entrepreneurial Europeans to figure out ways to make it more cheaply. One of their innovations was the plantation system which used enslaved labour. This appeared mostly in the Caribbean, Brazil and parts of North America like Louisiana — but it started in the medieval Mediterranean, spreading first to the small Atlantic islands like Madeira, colonised by the Portuguese, and then to the New World colonies. Europeans learned how to make these plantations larger, more technological — and more brutal. As the plantation system became more effective and more inhumane, it also decimated natural environments. It takes a lot of fuel energy to boil sugarcane juice — that caused deforestation. Growing a single plant over time depleted what were once very fertile soils. This made the colonisers keep seeking new places to establish plantations, which kept expanding sugar production around the world. Its problematic legacies have con-

tinued. Recent reports, for instance, find terrible labour conditions in sugarcane fields in India — 500 years of sugar in modern global capitalism show how making as much as we now demand means subjecting someone somewhere to a horrible working existence. Where this happens has moved around due to both environmental destruction and the rise of labour rights — but the sugar industry has been very good at finding the most exploitable people and often working them to death to produce cheap sugar. There is some awareness of such

SWEET TEETH



OMNIPRESENT: Some OJ with your sugar?

exploitation — British abolitionists started the first large consumer boycott for humanitarian reasons, protesting sugar produced by slave labour. Recently, it's been found the office in New York which controls hundreds of millions of dollars in city employees' pension funds owns massive stock in addictive food substance industries. They have been trying to use that leverage to make companies correct inhumane labour practices.

You've also written about sugar-fuelled corruption in the US government during its 19th century Gilded Age — could you elaborate?

In the late 19th century, the American government made a lot of money from taxes on sugar — but these were assessed on purity and there weren't very good ways to measure this. The industry then offered new scientific techniques to the government, ostensibly to solve its tax problem. Earlier, people working in ports and custom houses doing such measurements were fairly easily bribed — the new techniques then shifted both expertise and corruption to sugar chemists who could also be bribed. This helped sugar companies make more money than their competitors, with chemists advising higher charges on rivals.

How did technology push sugar's spread?

Around the 16th century, the plantation system produced a crop which was quite distinctive — early recipe books discuss a dozen different kinds of sugar and buyers were aware of which kind they wanted, which plantation it came from in Jamaica, Haiti, etc. By the mid-19th century, modern industrial technologies allowed the production of more sugar with far greater consistency. By the 20th century, sugar factories were much larger, powered by steam or electricity, with iron and steel equipment and chemists and laboratories, producing hundreds of times of sugar. The product became far more standardised — sugar from India, South Africa, Cuba, the Philippines and Hawaii was quite interchangeable and commodities

futures markets allowing for speculation began to rise.

Alongside, so did our addiction — since 1750, our bodies have been conditioned to consume a huge amount of sugar. Consumption statistics in the United States show how towards the late 19th century, per capita sugar consumption was 80 pounds a year. As more sugar was produced, people bought it in more products, from jams and cookies to savoury sauces and processed bread. People had always liked sugar but we also became chemically hooked to it. Several illnesses are now connected to the over-consumption of sugar, diabetes being the most notorious. Children are special targets of the industry — a study shows the more sugar you eat in the first two to three years of your life, the more adverse effects this has later.

Interestingly, sugar is also linked to temperament and behaviour. It's seen as a pacifying food — it can make people very happy for a bit, then lead to a crash. In 'Cuban Counterpoint', Fernando Ortiz, an anthropologist in the 1940s, juxtaposed tobacco and sugar — he emphasised tobacco was associated with rebellion and revolution while sugar was seen as lulling



ADDICTIVE: Sugar is seen as comforting

people into complacency. Importantly, the idea that sugar is bad for you is surprisingly recent. Even in the mid-20th century, sugar companies' promotional material featured doctors saying sugar energises you and it's healthy — it feels hallucinatory to read this now. There is evidence as well of how the sugar industry followed big tobacco's model in actively disguising its role in health problems, paying scientists to deny its impacts in causing obesity, heart disease, etc.

LET THEM EAT CAKE: Once a luxury, sugar sparked revolt



BYE-BYE, SWEETIE PIE...

Humans love sugar — wildlife foots its bill. Anteaters across Central America's forests find their habitat cut-up and polluted by sugarcane. The anteater, which grows 6 feet long, digs up ants and termites — usually in short supply at plantations. The species dates back 34 million years — but there are concerns now over how long this being with amazing smelling powers that differentiate between ant species can survive sugar



Orangutans, which diverged from human beings as a species 15 million years ago, are now critically endangered, thanks to our voracious appetite — demand for cocoa beans, used in chocolate, is driving deforestation in their habitat, leaving these gentle creatures — who are mostly arboreal or can live only in trees — homeless. Orangutan habitat in Sumatra is relentlessly razed, companies starting forest fires to clear expanses — and causing orangutans to perish

The Southern Cassowary is a flightless bird — with much to fly from. Found in Indonesia, Papua New Guinea and northern Australia, this relative of the kiwi dates back 40 million years. Now, sugarcane farms are cutting its tropical forests and releasing chemicals into ecosystems the cassowary needs — it consumes fruit and fungi and as we demand more sugar, these birds have less to eat



Research: National Geographic, BBC, Smithsonian Magazine, IUCN

'Chocolate has an incredible history of wealth, slavery, great ecological richness — and deep loss'

Katie Sampeck is British Academy Global Professor of Historical Archaeology at the University of Reading. She tells Srijana Mitra Das at TE about sustainability, sin — and chocolate:

Katie Sampeck's office is packed with books, files, papers in piles — and little yellow boxes. TE longs to ask what those are but Sampeck is describing her work. 'The core of my research is to understand the cultural history of chocolate.' Sampeck is not a confectioner or chef though — she is a historian who researches sites, documents and local archives, focusing on indigenous evidence and experience. 'These show us the everyday feelings of people consuming chocolate in their lives.' Sampeck also studies chocolate in phases of human transition. As she remarks, 'I'm interested in globalisation, environmental change, social inequalities and shifting technologies over time.'

Eras play a mighty role in Sampeck's work. Growing chocolate takes time. 'Cacao is the tropical tree whose seeds are used to make chocolate,' she explains. 'Northern Amazonians started tinkering with it, despite it being quite slow to produce fruit. This wasn't an instant payoff — but people were patient. Its story shows us an enduring love affair with this tree. It reflects how people managed climate alterations and agricultural productivity — and how they related to each other.'

The world of chocolate has deep roots, stretching 7,000 years. 'Its beginnings were in Venezuela and Ecuador. We see archaeological evidence of cacao being domesticated from plant residues and chemical traces on artefacts — people were using different parts of the cacao plant, combining it and creating recipes. The earliest items used for it are tall-neck bottles that look like they're for wine — but they stored a chocolate drink.' So wondrous was its taste that the product began to move. 'Within a thousand years,' Sampeck explains, 'Cocoa moved into Mexico



AGES AGO: A temple and monkey figurine excavated in Rio Ceniza Valley, El Salvador



GROWN WITH LOVE: Chocolate from cacao started in Mesoamerica, the complex of indigenous cultures in Mexico and Central America, way back in 600 BC — although it took time to grow, communities cultivated this patiently

and Central America. A whole set of technologies grew specifically for making cocoa drinks and foods, like special grinding stones, a method of heating and cooling to create solid chocolate, etc.'

It tasted amazing enough to take on spiritual meanings. 'We see archaeologically how cocoa seeds were used in ceremonies, weddings or dedication rituals for temples or deities. There are depictions in murals and paintings on pottery. All this,' Sampeck waves her hands in excitement now, 'Gives us a window into this really rich life, where cocoa was associated with fertility, beauty and wealth.'

Chocolate's association with richness was literal — Sampeck's research shows cacao actually became money. 'Cacao had grown cultural and ritualistic values — but it also became something that could be used in making transactions, pricing and trading.' This economy intrigued new arrivals. Sampeck states, 'Cocoa isn't easy to grow and only a few places were really big producers. By the 1530s, the first Europeans arrived in Mesoamerica and noticed this one region, in what is El Salvador today, was the most spectacular cocoa producer. They said money grew on trees there and Spaniards could make their fortune. Grown in discrete areas and circulated, cocoa was practically like an export product from its origins but Europeans stepped into that system now. Initially, they didn't like the drink itself — but they liked its earning potential.'

Eventually, chocolate conquered even the iffiest European palate. 'By the 1560s, there was more awareness of cocoa's culinary uses. By the 1580s in Spain, chocolate became the centrepiece of breakfast which had been a fairly neglected meal in Europe until then. Indeed, chocolate was the first caffeinated beverage to reach Europe — coffee, from the Middle East, came soon after and then came tea,' Sampeck stresses. 'We think of tea as dominating everything — but it's really the other chronology, where chocolate is the gateway drink.'

Yet, despite the growing ardour around it, chocolate was also seen by colonialists

as having a 'dark' side. TE asks Sampeck about her research on race in chocolate. She explains, 'Cocoa grew originally within sustainable agroforestry systems — here, it had other companion trees and vines. Indigenous texts describe exquisite drinks and foods made from this diverse set of plants, fruits and flowers that went all the way from the sunny edges of a thicket to a cloud forest. Early Spanish accounts, in describing cocoa, also talk about vanilla and achiote, other shrubby trees growing in the same environment. Until then, vanilla and chocolate were seen like twins. But European assessments were a little doubtful about chocolate — there was a growing association with 'sinfulness', with many feeling chocolate was just too pleasurable and alluring. Alongside, there were shifts in cocoa's production — the Spanish wanted to appropriate it. Indigenous people had managed how it was grown, which meant they retained rights over their land and could resist Spanish policies. But new cocoa-growing areas were set up in thinned forests in Ecuador, etc. Spaniards started plantations — with enslaved African labour.'

From being a source of pure pleasure, chocolate suddenly grew linked with pain. Sampeck recounts,



STACKED: Cocoa production in a 1929 advertisement, showing native labour under a colonial supervisor

'Cocoa turned from being a product of indigenous skill and craft to a system of extractive and oppressive labour, geared towards extremely high-volume production, cultivated as a monocrop, its ecological diversity now lost. By the 19th century, major production moved to West Africa, with the king of Portugal wanting to maintain direct control. Alongside the race to own it, there was this imagination of chocolate as 'dark', 'sinful' and born of enslavement.'

Meanwhile, vanilla moved to an exalted imaginary. 'Vanilla production grew restricted to areas like the Gulf Coast of Mexico because these were the only places with the right insects for pollination. A tremendous ecological shift — and devastation — occurred with monocropping and vanilla became select, prized and associated with a 'purity' which made it seem suitable for, say, children or 'good' women. Both chocolate and vanilla thus began as twins — but became polar opposites in connotation.'



WAKING UP: Consuming chocolate became part of European breakfasts

Chocolate continues its troubling legacies. Sampeck explains its environmental history — and present. 'It faces the same challenges now as in the 16th century, the early colonial era — there were climatic shifts then, a cooling which created unstable rainfall, drought, etc. We see the same instability affecting cocoa producers today, particularly in Africa. Monocropping has also lowered plant diversity and has a large deforestation footprint — these are all ongoing legacies.'

Finally, we ask if chocolate, with its bitter-sweet history, also touched the lives of non-humans. Sampeck chuckles and moves her swivel chair backwards, saying, 'Let me show you something.' She rummages about and then holds up a picture (see left), explaining, 'The original cacao agroforests weren't just home for plants, trees and soil but also for birds, insects and animals — and some of the oldest depictions show their deep bond with cocoa. Monkeys were simply enchanted by cocoa and ancient murals show primates consuming it. This is a pot we excavated in El Salvador which was part of a ceremonial deposit in a temple, showing a monkey with a lordly headdress and earrings. You can imagine he had his fill of cocoa.' TE concluded but didn't get to ask Sampeck about the little yellow boxes. Let's just imagine they hold stashes of chocolate — it's such a rich and delicious thought.

READERS WRITE

Dear Times Evoke, It was fascinating to read John Chiang's TE interview (15th February) on Earth's axis and orbital eccentricity! It was wonderful to think the seasons are caused by the regular way a planet changes its orientation with respect to the sun as it follows its orbital path. These long-term orbital changes also affect the amount of sunlight received. These effects are called 'Milankovitch cycles', taking place over tens of thousands of years, a driving factor in Earth's ice ages. Thank you for such a thought-provoking article, TE!

— Aditya Kamble, Kalaburagi

TE's stunning articles are simply fabulous! John Chiang explaining the orbital movement of Earth and the phenomenon of the Pacific Cold Tongue was brilliant. I also didn't know other planets have seasons as well. We often think our lives dominate the planet but in fact, there is a much greater science at work which rules every facet of our existence, down to the sunlight we see, and this is the case across the solar system! Thank you for such a well-presented piece, TE!

— Namita Joshi, Delhi

I'm extremely grateful to TE for providing such a superb article featuring John Chiang of Berkeley on how Earth's axis and orbit shape its seasons. I found this extremely absorbing. TE's drive to provide readers strong research from global experts is deeply appreciated.

— Partha Sarathi Biswas, Kolkata

TE highlighted a truly unique article featuring John Chiang's research about Earth's climate. Chiang's lucid explanations answered many of my long-standing queries about climatic occurrences. Kudos to TE for consistently presenting such knowledge-enhancing articles by eminent thinkers and scientists!

— George Mampilli, Fort Kochi

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