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Origin Foraging in Ecuador

Lifelong chocolate lover, author and scholar Simran Sethi travels to the center of origin and domestication of cacao.

What I had loved for my entire life, I could not find. Not in the colorful pods growing haphazardly out of tree trunks or the tiny orchid-like blossoms the size of my pinky fingernail; not in the pod's sweet-tart pulp or its pale, acrid seeds. Only through fermentation, drying and roasting would the fruit of the plant categorized by botanist Carolus Linnaeus as *Theobroma cacao* — “food of the gods” — begin to approximate cocoa and chocolate.

Chocolate — the foundation of the \$100 billion confectionary industry — has been my lifelong companion: my birthday cakes, my wedding cake and the comestible that got me through my divorce. Historically, cacao has been used as currency, medicine, an aphrodisiac and even, in Mesoamerican rituals of birth and death, a stand-in for human blood. “Observing an apparent similarity in the shape of cacao pods and human hearts,” anthropologist Oswaldo Chinchilla Mazariegos wrote of Maya scholar Sir Eric Thompson’s research, “[he] suggested that they were both conceived of as repositories of precious liquids — chocolate and blood.”

Today, the average American eats about three-fourths of a pound of chocolate per month. (The Swiss lead in global chocolate consumption at more than a pound and a half

per month.) But chocolate wasn’t always consumed by the masses. In fact, it was a prized possession originally served as a beverage. In the 16th century, the Spanish invaded the Yucatán Peninsula and Mexico and carried almond-shaped cocoa beans and recipes for the bitter, frothy concoction back to Europe as part of the spoils of their conquest. They stripped the drink of spiritual significance, sweetened it with sugar cane and made it the premier refreshment of the aristocracy. While initially valued for its medicinal purposes, it was soon appreciated for its taste. “Are we shocked to learn that a ... drug with supposedly curative powers was converted to recreational use?” asks Michael Coe, anthropologist and co-author of *The True History of Chocolate*. “We should not be.”

In 1828, Dutch chemist Coenraad Van Houten patented his method for extracting cocoa butter, the fat that makes up roughly half of a cacao bean, from processed cocoa, leaving a “presscake” that could be ground into fine powder. The process he created led to the creation of solid chocolate when, in 1847, Joseph Fry (an English doctor who sold cacao in his apothecary as a healthy alternative to alcohol) blended the powder with cocoa butter and sugar. Molded into small blocks, the paste — designed more for

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Simran Sethi



Cacao expert Simran Sethi suggests that, like wine, the flavors of cacao vary due to season, harvest conditions and producer inputs.

sustenance than taste — was used by the military during the French and Indian War, Revolutionary War and in World War II.

In love and war, chocolate has been our companion. This is why, in 2012, I travelled to Ecuador, part of a bean-shaped area where cacao originated. The area is also one of the centers of domestication for the crop — the place where cacao became chocolate. It is a country known for two types of cacao: a fine flavor variety called Nacional, and the high-yielding hybrid CCN-51. Together, they reveal the ways in which the crop — and its end products — have transformed since their inception.

Theobroma cacao is part of the mallow (Malvaceae) family of plants that includes cotton, okra, hibiscus and durian. Early designations were based upon only three types of cacao: Criollo (“native”), Forastero (“stranger”) and Trinitario (“native of Trinidad”). These identifications were vague because they were defined by appearance. Almost every kind of cacao — including Nacional, which is categorized as a Forastero — was slotted into these categories. More expansive classifications were published in a 2008 study by Juan Carlos Motamayor and a team of plant geneticists who clustered cacao into 10 genetic

groupings organized by geographical location or the traditional variety most represented in that particular cluster (Marañón, Curaray, Criollo, Iquitos, Nanay, Contamana, Amelonado, Purús, Nacional and Guiana). These classifications are based on the actual DNA makeup of the plants, not just their morphology.

This diversity matters. I grew up thinking chocolate was one flavor, not many. But through years of travel to cacao origins, plus training in chocolate making and the sensory analysis of cacao, I have found a depth of aromas and tastes I didn’t realize existed. These flavors are dynamic and — just like wine — change, depending on the season, conditions of the harvest and intentions of the maker. Generally speaking, cacao from Ecuador is characterized as having floral, nutty and chocolaty notes, while beans from, say, Venezuela offer up more delicate flavors of caramel and honey. These myriad flavors are a combination of place, processing and the plant itself. In regard to the latter, diversity is revealed in the shape and color of the pods and in the thin layer of pulp surrounding the seeds. The flavors of this mucilage range from custard apple and honeydew to peanuts and lime. Each pod is different: some puckeringly tart, some sugar-sweet, some tart and sweet simultaneously.



The fruits of CCN-51 are thick and juicy, with large seeds that hold a higher percentage of fat. These pods take well to inputs near harvest, making them a more prolific (and profitable) variety. However, questions about the long-term environmental health of the cultivar and region persist.

Biodiversity not only reveals an extraordinary depth of flavor, but also provides a hedge against future challenges facing the crop. Cacao grows in an equatorial band 20 degrees north and south of the Equator, a tropical area that is highly susceptible to climate change. A 2013 assessment of West Africa (where over half of the world’s cacao is grown) found that of the 294 growing regions examined in the study, 89.5 percent were likely to become less suitable by 2050.

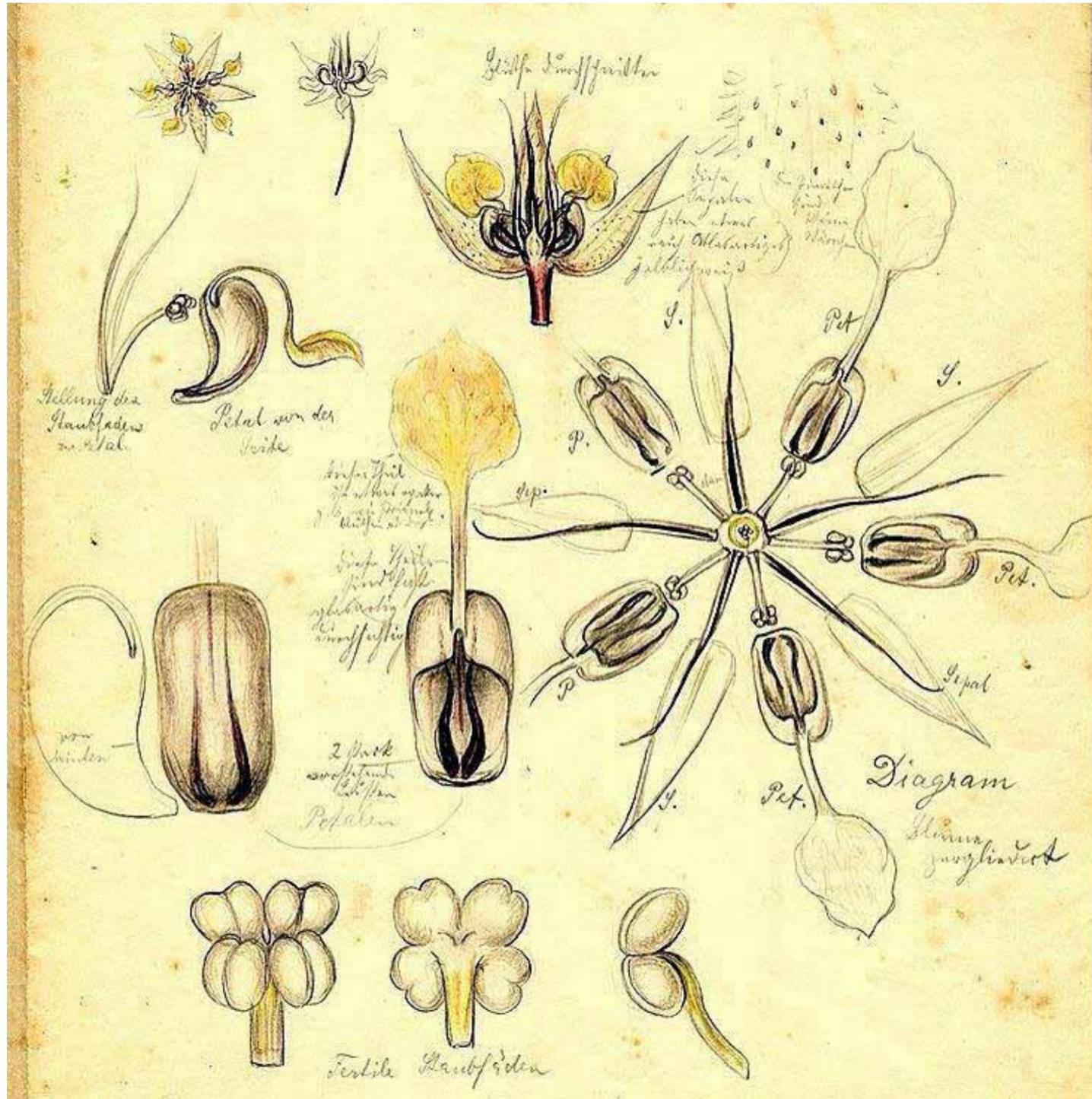
Those regions aren’t only impacted by rising temperatures. Pathogens with sinister-sounding names and devastating consequences — such as black pod rot, witches’ broom and frosty pod rot — along with mirids, moths and other insects, currently destroy between 30 and 40 percent of the world’s cacao crop each year, with losses estimated at \$2 to \$3 billion. Under hotter temperatures, this could get worse.

This is why so many in the cacao value chain advocate for disease-resistant varieties like CCN-51, a hybrid developed in the same country as Nacional. Nacional, also called Arriba, is one of the finest diverse cacaos in the world. Arriba (meaning “up”) is a reference to cacao that comes from the upper basin of the Guayas River, as well as all the rivers and streams that feed into it. “[It] is a cluster of varieties from low

altitudes that have been selected over time,” explains Michel Boccara, a visiting scientist at the University of West Indies’ Cocoa Research Centre. The tapestry of flavors is what makes the country one of the top global producers of specialty cacao. “Chocolate is a part of us; it is a part of Ecuador,” agricultural analyst Maria De Lourdes Alvear says. “Yes, we are a small country, but we have something no other country has: the flavor.”

Yet with each passing year, this treasured gene pool is eroded by a cacao that, Boccara explains, has little diversity. CCN-51 was developed by Homero Castro, an agronomist who spent years crossbreeding various cacao plants he’d collected from his travels. Working alone on his Naranjal farm he aptly called Theobroma, Castro cultivated a high-yielding variety resistant to frosty pod rot and witches’ broom — two diseases that had decimated nearly 70 percent of Ecuador’s cacao in the early 20th century and continues to harm the crop today.

In 1965, on his 51st attempt, Castro crossbred plant material from the eastern jungles of Ecuador with two clones: one that originated in Trinidad (ICS-95) and one that had originally been collected in the Peruvian Amazon (IMC-67). It was a winning combination. He



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named the variety CCN after the farm in Naranjal where he had conducted his work — Colección Castro Naranjal — and 51 for the number of times it took him to get it right.

Sadly, Castro never experienced the transformative impact of his work. He and his daughter were killed in a car accident in 1988 after leaving Theobroma. As a result, CCN-51 was never patented and ended up being released into the wild and planted on farms without much oversight. “In less than 30 years,” cocoa scholar Cristian Melo explains, “CCN-51 became the pride of the Ecuadorian cocoa industry. In terms of yield, [it] was like a sports car compared to a minivan. It produced four times as much as Nacional, but the price for both varieties was the same.”

The promise of high yields, disease resistance and a lack of oversight resulted in the hybrid’s rapid spread. Farmers systematically replaced traditional varieties with CCN-51. “Anything old was destroyed in favor of these big pods,” Melo says. “Outside of the research institution there was no place to get traditional varieties.”

This has resulted in such a proliferation of the hybrid in Ecuador that the International Cocoa Organization — a global organization that oversees the designation of countries producing commodity and specialized cacao — downgraded the percentage of fine cacao grown in the country from 100 to 75 percent.

CCN-51 grows well in many places, but it lacks the flavors unique to Ecuador; it’s ubiquitous and offers a fairly flat cocoa flavor, akin to the bulk cacao grown in West Africa. As such, it leaves the country competing with Ivory Coast and Ghana, countries that grow the majority of commodity cacao. This mass cultivation erodes Ecuador’s capacity to offer something special that commodity-growing regions will never have. Specialness is being lost, pod by pod.

But, to be fair, CCN-51 was never intended to have the floral notes or flavor complexity found in Nacional. Homero Castro wasn’t thinking about taste when he bred it. At the time, no one was. Now farmers, conservationists, makers and manufacturers are deeply invested in supporting biodiversity in cacao because they know the potential it holds. The challenge is, despite this recent focus, the majority of smallholder farmers — a group who grows 90 percent of the world’s cacao — earn less than \$2 dollars per day.

The fruits of CCN-51 are thick and juicy, with large seeds that hold a higher percentage of fat. This fat, once processed, becomes lucrative cocoa butter. When you see these pods, typically grown in full sun as a monoculture (which makes it easier to add inputs and harvest, but adds the host of challenges endemic to this type of cultivation), it is easy to understand why farmers have made the transition to a more prolific — and profitable — variety.

It takes about four years to grow cacao from seed and two years from grafts. The plants bear fruit for about 35 to 40 years, and then yields start to taper off. Every time yields diminish or plants die, farmers are faced with the choice of growing traditional varieties, such as Na-

cional, or replacing them with high-yielding hybrids or clones. Although Ecuador’s National Institute of Agricultural Research (INIAP) has developed nearly a dozen clones that offer improved yield and taste, Melo says they have come too late: “Farmers know CCN-51 is a productive variety; they trust that. So now they have to also overcome the fear of trying something new. The rewards take years to manifest, and farmers wonder if they should risk their money on something that may or may not work.”

Unfortunately, there are no easy answers to these complex questions. All the farmers I met in Ecuador are supplementing the Nacional they grow with crops such as bananas and/or CCN-51. This is not because they do not have a deep love for Nacional — farmer Alberto Bautista calls it “the cacao of [his] people” and “the blood of the earth” — but because the numbers do not yet add up.

“On one side, you have a high-yielding variety that gives you lots of cocoa with good chocolate flavor,” Melo explains. “On the other, you have a lower-yielding traditional crop — one that gives a cocoa with an incredible taste, the kind of thing craft chocolate makers dream about. The problem is, most times, farmers get the same price for both. In the end, we are asking Nacional farmers to forfeit the profits they would have made if they had switched varieties.”

The specialty market — of makers committed to producing high-quality chocolate that accentuates diverse cacao, along with consumers willing to pay a premium closer to the value of the crop and the labor behind it — is, perhaps, our greatest hope for transforming the industry. But there is not yet any data that confirms specialty chocolate or mechanisms such as Fair Trade have lifted significant numbers of producers out of poverty. The reasons are complex, but they start with demand. “How much money are people willing to pay for flavor?” Melo asks. “Twice as much? Three times? And how much of that goes back to the farmer?”

What we pay is not enough. Prices don’t reflect the real value of the crop. “Farmers want to satisfy our need, but they also have to be able to earn a living. So the tension remains.”

To support these farmers — and the makers that support *them* — we consumers have to be willing to pay more and to value chocolate not as candy, but something far more precious. The food of the gods, there for us in times of love and war. 

Portions of this story were adapted from “Bread, Wine, Chocolate: The Slow Loss of Foods We Love,” named one of the best food books of 2016 by Smithsonian Magazine.