

Science AMA Series: I’m David Roth Singerman, here to talk about the history of the science of sugar, AMA!

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Abstract

I’m a historian of science, technology, the environment, and American capitalism. I have a PhD from MIT’s program in History, Anthropology, and Science, Technology, and Society, where my research was supported by the National Science Foundation and the Social Science Research Council. My dissertation, “Inventing Purity in the Atlantic Sugar World, 1860-1930,” was awarded prizes in 2015 for the best dissertation in business history in both the U.S. and Britain, and his work has been published in the *Journal of the Gilded Age and Progressive Era*, the *Journal of British Studies*, and *Enterprise & Society*, while another article is forthcoming in *Radical History Review*. I’m currently a visiting scholar at UVA and working on my first book *Purity and Power in the American Sugar Empire, 1860-1940*, which narrates a new history of U.S. imperialism by tracing material struggles over knowledge about sugar’s substance and value. Drawing on research in U.S., Cuban, and Hawaiian archives, *Purity and Power* shows how the U.S.’s attempts to govern nature and human labor in its Pacific and Caribbean colonies were inseparable from contests over corruption, free trade, and corporate power at home. I’m also preparing an article about food, labor, and scientific knowledge in the 1880s and 1890s, examining scandals over the smuggling of frozen Canadian herring into Gloucester, Massachusetts. Before this, I was a postdoctoral fellow at the Rutgers Center for Historical Analysis and a research associate at Harvard Business School. Ask me anything about the history of science or technology! EDIT—thank you! This has been great fun. I hope my answers have been helpful and sorry I couldn’t get to all of your questions.

the WINNOWER

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DAVID_ROTH_SINGERMAN [R/SCIENCE](#)

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What's your take on Harvard's history of taking bribes to shift blame away from sugar to fat, given that you worked at Harvard and study the history of the science of sugar. Source: <https://nyti.ms/2cynH0S>

[DaseinHahaha](#)

I actually published an op-ed in the New York Times about that very issue later the same week! www.nytimes.com/2016/09/17/opinion/the-shady-history-of-big-sugar.html tl;dr (though it's less than 900 words): the sugar industry has been influencing science and policy for a long time.

Is there really no scientific proof that artificial sweeteners have adverse effects on health? Or do I have searching problems because of all the propaganda "studies"?

[sagittal](#)

As a historian of science I am hesitant to answer questions about what's been "proven" or not, since (as the other comments to this question indicate) you can pretty much always dispute the construction of experiments. (See the sociologist Harry Collins's idea of the "experimenter's regress.")

But instead I'll leave you with one of my favorite finds in my historical research. This is Wilfrid Skaife, a Canadian chemist who worked in sugar factories in the Caribbean around the turn of the 20th century.

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"The sugar world is used to such scares, but it got a bad one a little while ago when Prof. Remsen, of Johns Hopkins' University [sic], made from one of the derivatives of coal-tar, toluene, a substance called benzoyl sulphonic amide, or as it is now termed, saccharine. This is one of the chemical curiosities of the present day. It is a white powder, slightly soluble in water, and 280 times as sweet as sugar, that is, one pound of saccharine will sweeten as much water as a barrel of sugar. All sugar makers felt very uneasy when this came to light, but now it is known that it is harmful in its properties and valuable only as a medicine, those who own the five hundred million dollars invested in sugar in this world breathe again." ("Sugar Producing Plants," in the Canadian Record of Science, pp. 474-475, October 1889)

Hi David,

I notice that the title (and topic) of your book seems to be a play on the very famous one by Sidney Mintz [Sweetness and power: the place of sugar in modern history](#). How does your work add to Mintz's well known book and ideas? Do you disagree with him at all?

Edit to add link to a summary of Mintz's work for those who aren't historians or anthropologists

[firedrops](#)

Mintz's work (as I mentioned in a reply a few minutes ago) is wonderful and by all accounts he was a stupendously nice guy. I'm terribly sad that I never got to meet him in person. Here's a good video of him speaking at Duke just a couple years ago: https://www.youtube.com/watch?v=2O-oY_psmKk

As far as Sweetness and Power, I don't disagree with it but my work does build on his in several ways. One is that I'm much more interested in the labor history of sugar production than he is. As I read him, he takes "sugar" the food to = "sucrose" the chemical. But that can't be right historically, because the idea of "sucrose" depends on the discipline of organic chemistry and *that* didn't exist until the mid-19th century. So whenever slaves, planters, merchants, etc., spoke about the qualities of "sugar" (especially "purity") in the 17th century, for instance, they must have thought about it in other ways. So I'm interested in the ways that the question of "how to think about/value/produce sugar" was a point of contention between masters and slaves, factory owners and skilled workers, for instance.

Another is that Mintz stops his book around 1850 for a number of reasons and I'm primarily interested in what happens afterward. There's a strong overlap between studying sugar production and studying slavery—for good reasons! Slavery is the crime against humanity that's worth knowing about. But slavery ends in the Caribbean around 1850, give or take a couple of decades. And around the same time, new sugar factories begin to pop up that are far more mechanized than ever before, more under "chemical control," and produce massively more sugar. And so while sugar *plantations* are understood (by Mintz and everyone else) as sites of skilled labor, historians have more or less taken contemporary 19th century industrialists at their word that these new factories were automated and not places where laborers needed to be skilled at all. And that's one of the things my work is disagreeing with. Even the most modern sugar factories workers depended enormously on the craft knowledge of workers.

Wow, cool research from a historical perspective. Thanks first for doing the AMA. My question is revolves around the difference in sugar from sugar from cane and sugar from beets? How did the divergence and why did it occur?

Just an interesting difference, it is said that you may not use beet sugar in humming bird feeders due to the metabolic difference in processing the type of sugar.

[Leena52](#)

Good question! Sugar has been produced from the cane for at least a couple thousand years, but getting sugar from the beet is much newer. It's not a story of divergence but one of convergence. In the 18th century, a Prussian chemist concluded that you could extract a substance from the beet that looked like the sugar you could get from the cane. (Original publication here: <https://books.google.com/books?id=IJDAAAAMAAJ&pg=PA79#v=onepage&q&f=false>, the title translates as "chemical experiments made with the intention of producing an authentic sugar from various plants that grow in our countries.") Then in the early 19th century, Napoleon's European empire was blockaded by the British from importing cane sugar from abroad, so he subsidized sugar beet production on an industrial scale. Partly because of the economic shock to cane-growing of the end of slavery, by the 1860s and 1870s the (subsidized) beet sugar industry was cleaning the clocks of the cane sugar producers, who had once been the richest industry in the world.

If you process it to near chemical purity, beet sugar and cane sugar are the same—both sucrose. But "raw sugar" or "brown sugar" is always cane, because the other flavors in beet are acrid and unpleasant whereas the sugar cane is tasty on its own. And of course we in the West have lots of romantic associations with Cuba, Puerto Rico, Hawai'i, and the other "exotic" places where cane is grown. So you'll see palm trees and beaches pictured on sugar packaging, but you'll never see an frigid farm in Utah or North Dakota, where beets come from.

In his new book *The Case Against Sugar*, Gary Taubes claims not just that sugar is the main cause of the epidemic of obesity and metabolic/cardiovascular disorders, but also that the sugar industry colluded with academic researchers to cover this up and shift the blame toward dietary fat instead. Can you comment on the historical accuracy of that second part?

[Epistaxis](#)

I haven't had a chance to read Taubes's book thoroughly, but in general giant cover-ups are hard to pull off. My hunch is that it's less of a conspiracy and more a question of researcher incentives being aligned in particular ways by their funding sources.

Two totally unrelated questions:

One: I remember hearing about a big molasses spill in Boston that killed a bunch of people and how that was related to alcohol production. How much of the sugar-culture around the world was based on alcohol productions compared to how much was for sugar as food?

Two: Gary Taubes likes to write about the dangers of sugar and how 1960's research that vilified saturated fats was basically flawed and that it is sugar that is the real villain in world health. Are there actual historians looking into the sugar/health aspect of Western culture spreading around the world?

[Sunfest](#)

1) That's a good question, and unfortunately I don't have the statistics on the proportion given over to alcohol production. But that flood (1919) is interesting. Molasses is the byproduct of cane sugar production; basically, you boil and cool and boil and cool the cane juice carefully until you've crystallized as much sugar out of it as you can. The molasses is the leftover sludge out of which the sugar won't crystallize. So sugar planters would ferment it instead, to make rum. Boston (Medford in particular) had dozens of rum distilleries in the 19th and early 20th centuries, all of which are now gone as far as I know.

Do you think sugar use is related to the rise in Autoimmune disorders? (other than diabetes). I have

developed Hashimoto's disease and I'm wondering if my struggles with getting it under control are related to sugar consumption.

[Silvercelt](#)

As they say, talk to your doctor—I have nowhere near the medical expertise to speak to this question! But it's hard to see how cutting refined sugar from anyone's diet could hurt. I've been trying to eat no refined sugar since New Years; one of the effects is that it's just a lot harder to eat junk of any kind. I've found myself eating a ton of fruit instead.

There are a lot of 'sugar substitutes' that are rather... chemically concerning, shall we say? If you had to pick a substitute for regular sugar, what would it be, and why?

Also, what is your favorite sweet treat?

[TheChickenShaman](#)

I'm going to vote for maple syrup here. The dark stuff—what used to be known as grade B.

Commercial candy? Peppermint patties, obviously. Otherwise, ice cream. It's hard to pick...

Hi

Thanks for agreeing to do this AMA!

As we learn more about the effects of simple sugars on our metabolism potentially leading to obesity and diabetes, and as governments consider increasing regulation and taxation, as well as restricting advertising, do you think that sugar will one day become the new "smoking", and be ultimately relegated to something seen as unhealthy and stigmatized, that only a minority of people partake in? Or will we always enjoy our desserts and sweets?

Thanks in advance!

[mvea](#)

One difference between sugar and tobacco is that tobacco is, as far as I know, a poison; there is *no* safe level of smoking. But for sugar (as for alcohol) there definitely seems to be a level that is both enjoyable and safe. I personally hope we always enjoy some amount of dessert...

I have seen and heard a lot of people describing the studies surrounding sugar as corrupt as the old-school tobacco advertising that would describe positive impacts on health. How apt of a comparison is this?

Along the same lines, there have been allegations of corruption/heavily manipulative lobbying efforts by large food companies in Congress that many have compared to the power of large tobacco corporations during and following WWII. How influential are these lobbying efforts and what can an individual do to fight back? In particular how could people with low incomes do this, (especially since it is difficult for poor people in developed countries to eat a healthy diet)?

Your in-depth research on the subject of sugar has probably changed the ways you perceive of and eat sugar, so what does your diet look like?

[Endless_Facepalm](#)

I think there are clearly parallels to tobacco—see for instance my New York Times op-ed, linked to in an earlier answer. But it's not quite the same, as the weight of evidence that tobacco is a lethal poison was much clearer much earlier.

That said, the processed food industry lobby in general is enormously powerful, in Congress and in the executive branch (through USDA among other agencies). The work of the Union of Concerned Scientists (www.ucsusa.org) is a great place to start understanding this. And for seeing what you can do to make a difference, through state, local, and federal advocacy campaigns. Part of what's been done is to make processed food cheap, so that it's economically difficult for people to even consider moving to fresher and healthier sources.

On my own diet: I've been trying to eat no added refined sugar since new years. It's tough but it really has reset my palate so that now everything tastes sweeter and sweet desserts are almost unbearable. David Leonhardt of the NYT was even bolder than me—I haven't abandoned honey and maple syrup: <https://www.nytimes.com/2016/12/30/opinion/a-month-without-sugar.html>

Does the amount of sugar in a banana change as it gets more ripe? If so, which is better for human consumption...a green unripened banana, or a yellow/brown ripened banana?

[NokiaSnakeWorldChamp](#)

I am 100% the wrong person to ask: I'm allergic to bananas! Which is a shame, I loved fried plantains as a kid.

I thought you were David Roth, singer man. Like from Van Halen.

[beerforbreakfast91](#)

Blame my parents! (Please don't actually blame them.)

Has any questions been answered.

As I am interested in the health concerns of sugar derived from corn vs sugar cane vs simple sugars found in other foods like Maple syrup. Which is healthier and why are we so dependent on corn syrup as a sweetener in foods?

Thanks David

[ECCENTRICATTORNEY](#)

My general sense—and this is probably what Michael Pollan would tell you too—is that the closer you are to the plant, the better off you are. I think it's a good idea to avoid what Pollan et al. call "nutritionism"—the idea that we can know & manipulate the right nutrients to optimize health. In fact, human physiology and its nutritional demands are incredibly complex and have all sorts of second and third order properties, so we should maximize and optimize our consumption of food rather than "nutrients." All that is a long way of saying that the more non-sugar stuff from the plant is in your sweetener, the better. That's my layperson's take, anyway: maple syrup, honey (especially raw honey), the brownest granulated sugar you can find, instead of corn syrup that's essentially an industrial product at this point.

What do you think would happen if a major sugar tax was put in place? Also, do you think the body

reacts differently to corn syrup vs. raw honey? Or any other "healthy" sweetener?

[SailingPatrickSwayze](#)

It may be less a question of corn syrup vs. maple syrup or honey and more a reflection of the MASSIVE quantities of corn syrup that we shovel into our bodies in soda, snacks, etc.

As far as the sugar tax, there is evidence from Mexico that a soda tax is having an effect:

https://www.nytimes.com/2017/02/22/upshot/soda-sales-fall-further-in-mexicos-second-year-of-taxing-them.html?_r=0

A previous question asked about sugar as the new smoking; certainly high excise taxes on cigarettes do seem to dissuade people, especially kids, from smoking.