

## Sawbones 157: Pellagra

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**Clint:** *Sawbones* is a show about medical history and nothing the hosts say should be taken as medical advice or opinion. It's for fun. Can't you just have fun for an hour, and not try to diagnose your mystery boil? We think you've earned it. Just sit back, relax and enjoy a moment of distraction from that weird growth. You're worth it.

[intro music plays]

**Justin:** Hello, everybody welcome to *Sawbones: A Marital Tour of Misguided Medicine*. I am your co-host, Justin McElroy.

**Sydnee:** And I'm Sydnee McElroy.

**Justin:** Well, Sydster, squid, cricket.

**Sydnee:** Yes.

**Justin:** It's happened again. The great injustice has once upon been visited on the McElroy household.

**Sydnee:** What, what is this injustice?

**Justin:** Well, it's so polite of you to act like you don't know, but the truth is... [sighs] it happened again, Syd. I got passed over once again.

**Sydnee:** For what? What were you expecting to be recognized for?

**Justin:** Uh...

**Sydnee:** For what were you expecting to be recognized? Let me correct my grammar.

**Justin:** Well, Sydnee, the Nobel prizes came out and I didn't get a one of them.

**Sydnee:** So for the Nobel Prize?

**Justin:** Once again.

**Sydnee:** Which, which one? Which one did you think you had nailed down this year?

**Justin:** [quietly] Podcast?

**Sydnee:** Aw, that's the only problem.

**Justin:** What?

**Sydnee:** There's just not a podcast prize. A Nobel podcast prize.

**Justin:** Well, and Roman Mars would win it probably. Or Ira Glass, or somebody.

**Sydnee:** Hey, hey.

**Justin:** What?

**Sydnee:** Don't cut yourself short.

**Justin:** Well, you're right, Syd.

**Sydnee:** You might, you might get it!

**Justin:** There's always next year.

**Sydnee:** Who could have thought? Who— How could Alfred P. Nobel have ever envisioned that someday there would be a podcast prize?

**Justin:** Yeah.

**Sydnee:** And that Justin McElroy would win it.

**Justin:** Yeah, I think they would probably invent it just to— so I could be recognized for my contribution. You know, listen, if they'll give a literature one to Bob Dylan, then who knows? It's all higgledy piggledy, cats and dogs out there.

**Sydnee:** I have no opinion on that. I don't know.

**Justin:** Well, that's fine.

**Sydnee:** I don't know. I mean, is everyone who writes in the running? I don't know.

**Justin:** Yeah. Anybody who's ever put pen to paper.

**Sydnee:** Bob Dylan's pretty cool, man. That's all I'll say.

**Justin:** He seems like a cool cat.

**Sydnee:** He seems like a cool dude. Music makes me happy, I think.

**Justin:** He's not as good as Elvis Costello, but hey, that's– them's the breaks.

**Sydnee:** I mean he's no Jimmy Buffet. [laughs]

**Justin:** Sorry Bob. He's no JB. Why are we talking about the Nobel Prize again? I've forgotten already.

**Sydnee:** Because I thought it was notable that among the winners of the Nobel Prize this year were six Americans who are immigrants.

**Justin:** Wow. That is notable.

**Sydnee:** I think it is, in the fields of chemistry and physics and economics. Among them there were six American immigrants, just adding to the fact that immigrants make this country great.

**Justin:** Yes. Immigrants do help make this country great.

**Sydnee:** Absolutely.

**Justin:** Oh, so we–

**Sydnee:** And I thought we should celebrate that.

**Justin:** All right. And like... let's do it. Are we talking about one of them?

**Sydnee:** We, yes. One of them, we're– Well, no, not one of those–

**Justin:** One of those winners.

**Sydnee:** Nobel Prize winners. No, no, no.

**Justin:** No, no, no, no.

**Sydnee:** No. We're gonna talk about pellagra, which is a disease. But well, I'm gonna get to– You're gonna see how this fits in trust me. Okay.

**Justin:** Okay. I love that, in media res, and then we back up and it's– like all becomes clear. I love it.

**Sydnee:** Yeah. And at the end, will you say, "And that's... the rest of the story."

**Justin:** [imitating Paul Harvey] "And now you know... the rest of the story."

**Sydnee:** Is that how it goes?

**Justin:** Yeah. That's Paul Harvey.

**Sydnee:** Right. You had to explain that reference to me 'cause I didn't understand it.

**Justin:** That's okay. I'll get you a few– He's got some books and stuff.

**Sydnee:** Okay. So let's talk about pellagra. Thank you to Ethan and Rebecca and Hannah for recommending this topic. Now, Justin, do you know what pellagra is?

**Justin:** I have no idea.

**Sydnee:** It's–

**Justin:** I had to have you say it, like, four times–

**Sydnee:** Right.

**Justin:** When we started, because I had never heard of it.

**Sydnee:** Now, to be fair, of diseases that you could be unaware of, that– I think that I'll cut you a break on this one, because it's not very common these days.

**Justin:** Mm-hmm (affirmative).

**Sydnee:** Especially not here where we live. It comes– The word comes from the Italian for sharp skin. And basically it boils down to, for the most part, a vitamin deficiency.

**Justin:** Okay.

**Sydnee:** Niacin, specifically, vitamin B3. Now, it's a little bit more complex and it usually has to do with some deficiencies in protein and other B vitamins and such. But the main thrust of it is that when we say pellagra, we're really talking about a niacin deficiency.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** Okay? So, it's also called– By the way, there are lots of names for it. One of my favorite is Saint Ignatius' itch, which I just, I had to share, 'cause I really enjoy.

**Justin:** That's pretty good.

**Sydnee:** I don't know why it's called Saint Ignatius' itch, I didn't read about that. I just thought it was a funny name. There are lots of other names. It's– Niacin is not hard to get in your diet now. Okay? So you probably get plenty of niacin in your diet as is.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** It is in lots of different foods.

**Justin:** I feel like it's been advertised as part of Raisin Bran, does that– does that track for you? Is it in Raisin Bran, you think, or Total? No, Total is the one that I'm remembering.

**Sydnee:** It probably does.

**Justin:** Yeah.

**Sydnee:** A lot–

**Justin:** Niacin and riboflavin are, like, tied in my head.

**Sydnee:** Mm-hmm [affirmative]. Yes. They often run together, and actually deficiencies of them often run together as well. Which is why sometimes, if you read like descriptions of pellagra, you might find features of other vitamin deficiencies in there, because they tend to kind of go together.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** If you don't get one, you probably don't get the other.

**Justin:** Okay.

**Sydnee:** Now, niacin is in lots of foods. It's in turkey, chicken, peanuts, peas, tuna, liver, mushrooms, beef, avocado, sunflower seeds, lots of things naturally, plus we fortify lots of foods with niacin. It is not hard to get niacin.

**Justin:** Yeah.

**Sydnee:** Okay? Now.

**Justin:** In today's world.

**Sydnee:** In today's world, for the most part. For the most part. It's characterized– the disease is actually characterized– We used to say it's the disease of the three Ds. Although that's somewhat misleading, 'cause there are other symptoms and some of these– You know, it's like any disease, we kind of have like the classic picture of it, but everybody's a little different.

**Justin:** Sure.

**Sydnee:** So there can be variations on a theme. But mainly you would have dermatitis, that's where the name pellagra comes from, 'cause you get a really bad dermatitis inflammation, like red, looks like a sunburn. And then peely kinda skin, often around like the neckline. And then anywhere exposed to sun– sun will make it worse. You can get really bad GI problems, so lots

of diarrhea, that's the second D. And the third D is for dementia, because it can cause a lot of neurological problems that can eventually progress to a dementia. Sometimes I see it the four Ds, because people add death in there, but I think that's kind of dramatic.

**Justin:** Wow, for a deficiency?

**Sydnee:** Well, you can die of it.

**Justin:** Yikes.

**Sydnee:** I mean, you don't necessarily, but you can. No, it is a big problem when it happens. It's pretty rare today, like I said, especially in— where we live in the US, because it is fortified in many of our foods and plus we eat a lot, you know?

**Justin:** Mm-hmm [affirmative].

**Sydnee:** But there are places where it still exists. We'll get to that. Pellagra dates back to 1763 when Don Gaspar Casal first described it among Spanish peasants. They used to call it Mal de la Rosa, and they thought it was— that it was confused a lot for leprosy, because of the skin condition.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** They didn't really understand it. They kind of described it— they saw it— they knew that it had something to do with poverty, something to do with not having enough of something.

**Justin:** Something.

**Sydnee:** But there was no understanding of, like what that would mean.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** You know, what that— that would have something to do with food. You actually can trace the spread of it, along with the spread of maize from the New World.

**Justin:** Okay. You— Why?

**Sydnee:** Because it is common in people who ate corn-based diets, because they were often deficient in niacin. And so as you see, the maize agriculture—the process, the growing maize—

**Justin:** Mm-hmm [affirmative].

**Sydnee:** Spread from the US. Or, well, the New World, you know, before it was the US, to Europe. You can see that pellagra follows.

**Justin:** Hmm.

**Sydnee:** So as it spread to Europe, and then to other maize-based areas in certain countries in Asia and Africa, you find pellagra. Now, you might be asking the question, why am I not mentioning South America, or Latin America at all?

**Justin:** Yeah, they're— I know that there are corn-based dishes in that part of the— neck of the woods.

**Sydnee:** Absolutely. They treat their maize though with lime and wood ashes, that's just a traditional practice, it's been done for as long as they've been eating corn, and that actually makes the niacin that is already in there, easier for our bodies to absorb. We say it increases the bio-availability. So that process probably saved them from pellagra, even though that— I mean, I'm certain that isn't why they were doing it.

**Justin:** It also sounds delicious, by the way. I'm like super-duper hungry for Latin-American corn right now.

**Sydnee:** We'll go eat some corn after this.

**Justin:** I would just crush some corn.

**Sydnee:** Back in the— The main thing I wanna talk about pellagra is in the US, because in the late 1800s and early 1900s, pellagra in the United States, especially the Southern United States, was a huge problem. It may have been in the US all the way back to the 1820s, but we really see good descriptions of it, and the problem that it was causing, how prevalent it was, in 1907. And from 1907 to 1940, three million Americans were diagnosed with pellagra, and 100,000 of those died.



**Justin:** Wow. So this was a huge problem.

**Sydnee:** This is a huge problem. And as I mentioned, mainly in the South, there were a lot of people there who were living in poverty, and they ate diets that consisted of various corn-based products and really not much else.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** So, as you can imagine, there were a lot of other nutritional deficiencies that they were suffering from.

**Justin:** Sure.

**Sydnee:** But pellagra was the big bad one that the US was seeking a solution for. So, like I mentioned, the symptoms. Everybody was having these horrible rashes, it was making them weak, they were unable to work. You know, it made you very tired all the time, lots of GI issues, and then these progressive neurological problems that were, again, even if it– Even if you didn't die from, it could cause a lot of damage, and a lot of morbidity. So the US government started to try to figure out, "What is going on, and how can we fix it?"

**Justin:** Mm-hmm [affirmative].

**Sydnee:** You know, we need to appoint a commission, we need to have scientists, let's get the surgeon general involved, let's go down there and let's try to figure out what's going on. Now in the past, theories on pellagra were like a lot of other diseases. Maybe we– They knew it was associated with places where you eat a lot of corn.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** So they thought maybe there was a toxin in the corn.

**Justin:** That makes sense.

**Sydnee:** Their thought maybe it was just something that some people got, because it tended to recur in the same people, and it tended to be seasonal because the sunlight made the rash worse. So you would see the same

people tending to get sicker every year in the spring and summer. So you thought, "Well, maybe it's just— like this is something poor people get."

**Justin:** Are like— are deficiencies like this, something that like— It seems weird to me that... everybody wouldn't get the— You know what I mean? Like that everybody wouldn't get this disease, if a culture didn't ingest stuff with niacin in it.

**Sydnee:** I mean, it really— I mean, you're talking about social classes, so everybody who only had— only could afford this food to eat did get it.

**Justin:** Okay. That makes sense.

**Sydnee:** More or less. I mean, you know, everybody would.

**Justin:** Yeah. Okay.

**Sydnee:** Now everybody has different thresholds, and who knows how much storage they had ahead of time. So like timeline, who gets it first, and—

**Justin:** Mm-hmm [affirmative].

**Sydnee:** How bad does it get, that has a lot more to do— And what other nutritional deficiencies ran with it? You know, what— did you just have B3 deficiency, or other things too?

**Justin:** Yeah, that makes sense.

**Sydnee:** So at the time, if you remember, at this point in history, we had just figured out the germ theory of disease.

**Justin:** So I bet they were crazy dependent on germs.

**Sydnee:** Absolutely. That was—

**Justin:** It was the hot new, hot new trend.

**Sydnee:** [laughs] It was very trendy. It was. It was very popular to say, "Well, obviously, this is caused by a germ. I don't know if you're familiar."

**Justin:** Cracked it.

**Sydnee:** "There's this new theory that everybody's talking about."

**Justin:** That's- that I- That would be amazing that, to just hear like, "Oh, I see your arm's in a cast, was it a germ? I hear that those cause a lot of issues these days, was that germ-related?"

**Sydnee:** [chuckles] That was exactly- It was very trendy. Germ theory of disease was like the Pumpkin Spice Latte of its time. [chuckles] Is that trendy?

**Justin:** The- I think that's like- It might be out now.

**Sydnee:** Oh no.

**Justin:** I feel like salted caramel is like the new pumpkin spice.

**Sydnee:** Is it? Skinny jeans? Are those still in?

**Justin:** I- Now, listen, I had-

**Sydnee:** Jeggings?

**Justin:** I had-

**Sydnee:** Funny mustaches? [chuckles]

**Justin:** They have a chocolate coffee with hot flavors in it, now at Starbucks, the Chile Mocha-

**Sydnee:** Oh.

**Justin:** That I think that maybe that may be the new thing. Hot, like spicy chocolate, maybe like the new salted caramel.

**Sydnee:** What about coconut milk? That's really big right now, right?

**Justin:** You can make, get it made with coconut milk, it's not bad.

**Sydnee:** Coconut milk is so hot right now.

**Justin:** Well, okay. We have to get back on track.

**Sydnee:** Okay. The surgeon general appointed Dr. Joseph Goldberger to figure this out.

**Justin:** Okay.

**Sydnee:** Now, let me give you a little back story.

**Justin:** Goldberger's on the case.

**Sydnee:** Dr. Goldberger. So he was born in 1874 and–

**Justin:** [singing to the tune of “Goldfinger” by Shirley Bassey] “Goldberger.” That's a theme song I just made up for him.

**Sydnee:** He needs a theme song, he deserves a theme song.

**Justin:** All right.

**Sydnee:** He was born in 1874 in Hungary, and his parents were initially sheep herders and their flock died, was decimated. Anyway, they didn't have sheep to herd, and so they packed up the whole family, six kids, and moved to the US.

**Justin:** Sheesh.

**Sydnee:** And they opened a small grocery store on the Lower East Side of Manhattan, ran it together, and the kids all helped as well.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** And so that was– that was Joe. Can I call him Joe? I can call him Joe. That was his first name.

**Justin:** Yeah.

**Sydnee:** That was his first job. He went to the City College of New York, and he initially pursued engineering, that was his plan. But there was a visiting lecturer who came in and gave a lecture on physiology and the human body, and he became so fascinated with the inner workings of the human body that he changed his mind and transferred to Bellevue and got a medical degree instead.

**Justin:** Wow.

**Sydnee:** And became a doctor. So I'll call him Dr. Goldberger now, he has just earned it at this point.

**Justin:** Congratulations, doc.

**Sydnee:** He's no longer Joe. He started a private practice in Pennsylvania at first, but he got really bored. He was really clever, he was very curious, and private practice was just not his thing. So he got bored. And he joined the US Marine Hospital Service, which later would transform into what we know as the US Public Health Service. Okay?

**Justin:** Right on.

**Sydnee:** Because at the time, there was this idea that we could send these smart doctors kind of out to various places in the country, or maybe even outside the country, to track down like epidemiological mysteries. Like a disease is spreading, we don't know what's going on, we don't know how to stop it. Let's send all these smart doctors out and try to figure it out.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** And that sounded very exciting, and he was very intellectually curious. And this suited him well.

**Justin:** And everybody was crazy for germs.

**Sydnee:** Everybody was crazy for germs. We had just learned about germs, we were really excited. So they're so hot right now. He was— He initially started working on actually inspecting other immigrants who came through the port for like communicable diseases. 'Cause that was—

**Justin:** What a— what a traitor. No, I guess not.

**Sydnee:** [laughs] No, no, no, he's a doctor, he's responsible for public health.

**Justin:** That's true. I guess inspecting other immigrants for germs is only bad and creepy if you're not a doctor.

**Sydnee:** Yes.

**Justin:** You just appoint yourself that, that's like not a good look.

**Sydnee:** No, no, exactly. No somebody should– I mean, he was doing it because the government wanted him to.

**Justin:** "Hold on up folks, hold up, not so fast. Gotta look you over for germs, they're very hot right now."

**Sydnee:** And you would be quarantined. I mean, that was the plan.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** Was to quarantine you until you got better.

**Justin:** Yeah.

**Sydnee:** And then let you continue. The plan was not to send anybody back.

**Justin:** No, no.

**Sydnee:** Let me make that clear.

**Justin:** Okay. Got it.

**Sydnee:** I'm not saying bad things probably didn't happen, I don't know that whole history, but that was his job.

**Justin:** Fair.

**Sydnee:** After that, he– because he was so good at being an epidemiologist and figuring out disease patterns and com– You know, where did things come from and that stuff, that he started getting assignments all over the place. He went to Mexico, and Puerto Rico, and parts of the South to study yellow fever. He actually got yellow fever–

**Justin:** Mm.

**Sydnee:** In the process, but don't worry he beat it.

**Justin:** Nice.

**Sydnee:** He worked in the Hygienic Lab in Washington for a while, which we've talked about before, later became the National Institute of Health.

**Justin:** Hygienic Lab has gotta be the uncoolest place during germ fever.

[Sydnee chuckles]

**Justin:** Like, "Uh, gross. You work where? With no germs, ugh, poor you."

**Sydnee:** He got to work with typhoid there though.

**Justin:** Oh, I guess that's pretty good.

**Sydnee:** He just was very hygienic about it.

**Justin:** Yeah. Right.

**Sydnee:** He went–

**Justin:** So boring.

**Sydnee:** He went to Texas to study dengue fever and got dengue. [laughs] Uh, he went to Mexico to study typhus and–

**Justin:** Got it?

**Sydnee:** Got typhus.

**Justin:** Oh man, Goldberger.

**Sydnee:** But the important thing is he survived it, and I bet he was pretty tough. He actually– the way that letters indicate he viewed it was they were like battle scars. Like, he thought like it was kind of cool. Like–

**Justin:** Yeah.

**Sydnee:** "I got so into it that I got it."

**Justin:** "Man, I had the craziest diarrhea, just, like, diarrhea all the time."

**Sydnee:** But here's the thing, I used to– I understand that. I used to think, like, "If I could just get a little malaria and then get better.." I don't think that anymore.

**Justin:** That would be cool.

**Sydnee:** I don't think that anymore, I don't think that anymore.

**Justin:** You're like a disease tourist, Sydnee!

**Sydnee:** I'm older and smarter. And I understand that that's a terrible thing to want, and it was just–

**Justin:** Okay.

**Sydnee:** When I was younger, I could see myself thinking, if I was so immersed in something– Anyway, he also got married at this time period, and to add to what a tough, kind of–

**Justin:** What a lucky lady [laughs].

**Sydnee:** No, it was actually a great match because they were both fascinated with science. They both very strongly believed in the scientific method, and in science to improve the lives of people, especially medical science. But he was Jewish and she was an Episcopalian, and that was very daring at the time.

**Justin:** Ooh.

**Sydnee:** And both families were quite displeased.

**Justin:** Scandalous.

**Sydnee:** Yes. All of this work led to better understanding of all these diseases that he was studying, and how they were transmitted, and he was very celebrated. So it was not surprising in 1914, when the surgeon general appointed him to, you know, study pellagra.

**Justin:** Okay.



**Sydnee:** This all led up to this moment. He had heard of some early experiments that had been done, where they had tried to figure out– like trace the disease, and who has it, and study, and like population studies. And it was all supposedly related to either a germ– a lot of people thought a germ, or maybe just that corn that had gone bad, people were just eating corn that had gone bad.

**Justin:** Right. Right.

**Sydnee:** And that really didn't seem to make sense to him, because what he noted is that they studied pellagra in a lot of, like, institutional settings. Orphanages or psychiatric hospitals, those kinds of things. And all of the people who live there, you know, the orphans or the inmates or whatever, in a prison, or the patients in a psychiatric hospital, they all had it, but the staff didn't.

**Justin:** Hmm. So you would think if it was like– If they were eating from the same source and it was a disease, if that was the vector, then they would– the staff would have it as well.

**Sydnee:** Right, if it was a germ.

**Justin:** Right.

**Sydnee:** Yes, exactly. If it– You know, germs don't know social class, they infect the rich and the poor equally, so that didn't make sense to him. So he thought something with the diet may be what the problem is. So he set up a series of experiments, experiments in orphanages, in psych hospitals, where he basically gave everybody a better diet, fresh meat, fresh milk, vegetables, and then saw if they got better. And then he continued to give them a better diet through the next year to see if they got pellagra again the next year. And they didn't.

**Justin:** And they didn't.

**Sydnee:** So he had all– Now, I should note a couple things about this. One, he didn't have a control group, but that was basically because they just couldn't give some orphans good food and other ones bad food.

**Justin:** Yeah, 'cause, like–

**Sydnee:** 'Cause that's really–

**Justin:** "Excuse me, sir, why do we only eat Cheetos? Don't get me wrong, I love their cheesy flavor, but sir, can't I have a spot of meat?"

"No. Eat your Cheetos."

**Sydnee:** "You're in the control group."

**Justin:** "You're in the control group. Eat up."

**Sydnee:** Now, to be fair, there's a lot you could– Ethicists would battle about it at this point. I'm sure no one signed consent for this, I'm sure no one knew they were participating in any dietary experiments. I think it's nice that they at least didn't include a control group, not so robust scientifically, but much more humane. Either way, the point is they figured out from this that improving the diet, giving people more– They really thought fresh meat was tied to this– would improve, you know, the pellagra.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** He also set up an experiment among inmates in a Mississippi prison, where they were offered freedom in return for participating in this study. Again, not great ethically. 11 men signed up for this, and they were basically given a really deficient corn-based diet for five months.

**Justin:** Yikes.

**Sydnee:** And six of them got pellagra. So they thought, "Well, there you go."

**Justin:** There you go.

**Sydnee:** It's a diet thing. You just improve the diet, they get better, they don't get pellagra. That's the end of it. And then 11, whatever they did, were set free. I don't know if they were murderers, or–

**Justin:** Quick "Justin checks the internet" sidebar. Uh [laughs] Cheetos totally have niacin in them, so–

**Sydnee:** So forget that.

**Justin:** Forget that, that you wouldn't- that wouldn't be a good control group.

**Sydnee:** Don't slander, don't slander Cheetos anymore.

**Justin:** So what, so w-

**Sydnee:** So we figured it out.

**Justin:** So that was it, right? The medical community said, "Thank God, pellagra is behind us."

**Sydnee:** Yeah. You'd think, but before I tell you what happened next, why don't you come with me to the Billing Department?

**Justin:** Let's go.

[transition music plays]

[ad break]

**Justin:** Okay. So you were about to tell me some whack stuff about how the medical community did not immediately line up behind this amazing new discovery.

**Sydnee:** That's right. The scientific community-

**Justin:** Which is okay. That's science, right? It is- You guys love to be skeptical before you accept new truths, right?

**Sydnee:** Oh, it's- yes, absolutely. I think it's fair to say that, in science, not necessarily- if something is brand new, just not assuming that it's correct, but studying it and being vigorously curious, I would say, is always important. That being said, I also think that people are predisposed to believe that if they figured something out and it makes sense to them that they're right.

And sometimes accepting new information, assimilating that into your understanding of the world can be difficult. And this was very hard for the

scientific community. They didn't think it made sense. They didn't like the idea that it wasn't a germ because—

**Justin:** They loved germs.

**Sydnee:** They were all about germs. I think it was probably also fair to say that, as I mentioned, Dr. Goldberger was an immigrant, and he was a Jewish immigrant, and there was probably a lot of prejudice and discrimination that played into a lot of people's combating this and saying that "That can't be right."

**Justin:** Yeah.

**Sydnee:** There was also a lot of association with the South and with poor people, and with— Somehow that this was like a negative. It cast a negative view of them, and that played into it as well.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** So a lot of Southerners were angry about it.

**Justin:** So how did they convince them?

**Sydnee:** So to prove his idea, in 1916, Goldberger injected his assistant, George Wheeler, with five CCs of blood from someone who had pellagra.

**Justin:** I mean, very impressive, but only slightly less so because he's like, "Uh, George? George, can you come in my office for a second? George?"

**Sydnee:** [laughs] Now, it should be noted, George volunteered for this. And in return, George injected Dr. Goldberger with six CCs of blood.

**Justin:** Ah, okay.

**Sydnee:** From someone with pellagra, and nobody got sick.

**Justin:** Right.

**Sydnee:** But they weren't done. That's not enough.

**Justin:** That's not enough.

**Sydnee:** Let's take it a- let's take it further.

**Justin:** Okay.

**Sydnee:** So they took a cotton swab-

**Justin:** I don't know how you go further than injecting someone's blood but...

**Sydnee:** Yeah, they- No, they took a cotton swab and they swabbed the inside of a patient who had pellagra's nose with a cotton swab, and they took that cotton swab and stuck it up their own noses, and swabbed the inside of their noses with it.

**Justin:** Yuck-a-rooney. And I'm assuming nobody got sick.

**Sydnee:** Nobody got sick. But that's not enough. They're not done.

**Justin:** [nervously] Okay.

**Sydnee:** Then they took a swab, swabbed the inside of a pellagra patient's throat.

**Justin:** Okay.

**Sydnee:** And-

**Justin:** Then they got sick.

**Sydnee:** Well, then they swabbed their own throats with that same-

**Justin:** Okay.

**Sydnee:** Throaty, throaty swab, that same mucusy, throaty swab.

**Justin:** [gags] Stop.

**Sydnee:** Nobody got sick, but that's still not enough!

**Justin:** I'm sure it's enough!

**Sydnee:** Wait, there's more!

**Justin:** I'm certain that's enough.

**Sydnee:** Wait, there's more!

**Justin:** I just read ahead. Oh, God.

**Sydnee:** They took scabs from the rash of a pellagra patient-

**Justin:** [muffled] The worst.

**Sydnee:** And I'm assuming, like kind of ground them up, made them a little powder, made them small, made them dusty powder. Powdery, scabby, dusty, put them inside capsules and swallowed them.

**Justin:** Oh no [laughs].

**Sydnee:** And nobody got sick!

**Justin:** Yeah. Somebody did, his name's Justin McElroy, and they somehow got him, in 2016. Oh, yuck-a-rooney.

**Sydnee:** He began to- And this was- he was publicizing this as well, of course, to try to combat-

**Justin:** Oh sure, in like the grossest, dirtiest magazines possible.

**Sydnee:** He called them "filth parties". Well, I don't know if he called them, or if the- I should say, this was probably something from the media, but they were called filth parties. And he had other volunteers, including his wife. Like I said, she was a big fan of the scientific method as well.

She believed in this and it made sense scientifically. Not just 'cause she probably also loved her husband, I'd say that's probably part of it. But together they swallowed scab pills and injected each other with blood and swabbed each other's noses. And-

**Justin:** I can't, I can't with this.

**Sydnee:** Other people joined in and they– no one got pellagra, and that should have been enough.

**Justin:** But?

**Sydnee:** But yet it was not. And while all this is happening, let me say, 'cause this all sounds like fun and games, like we're having these filth parties and–

**Justin:** Right.

**Sydnee:** Doctors are writing in JAMA that, in the Journal of the American Medical Association, that this is wrong. But people in the South are still getting pellagra, and some of them are dying. This was being made worse by the land tenure system, sort of, like the share cropping system of the time.

**Justin:** Sure, yeah, yeah.

**Sydnee:** Was very unjust, so a lot of people were living in poverty already. And then the price of cotton was dropping at this point in history, about around 1920. And so many, many farmers were– and their families were starving as a result. And the government wasn't doing anything about it at that point.

Goldberger kept warning, "Listen, if we don't change this land tenure system and use more diversification of crops and allow– get– have these people– You know, allow these people access to more foods, like this is going to keep getting worse. More people are gonna get sick and more people are gonna die." But nothing was changing.

President Harding, in the Public Health Service, tried to direct funds to stop the crisis, they actually tried to send more money and more doctors, and send relief to the South. But a lot of the Southern lawmakers and congressmen did not want this.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** They didn't want help. They didn't want this narrative. They wanted it to kind of be silenced because they were worried about people not wanting to do business with the South, because all their workers are sick.

**Justin:** Right.

**Sydnee:** They can't- You know, you don't wanna do business with a Southern company because everybody's too weak and sick to work. And they didn't wanna hurt tourism.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** So they wanted this kind of squashed, and they didn't want Washington sending them money and assistance. So without putting any of this into practice, the South continued to suffer, and all of his predictions about more people being sick, and more people to being dying or dying, were coming true. Do you know what changed things?

**Justin:** What?

**Sydnee:** Not Dr. Goldberger, unfortunately, the boll weevil.

**Justin:** How did the boll weevil change things?

**Sydnee:** The boll weevil, in the 1920s, came to the South and decimated cotton crops, so they had to start growing other things.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** And what they grew, they also were eating, and niacin and became part of their diet again. And we start to see pellagra cases dropping.

**Justin:** So because the boll weevil ate the cotton, they had to grow other stuff, and the other stuff-

**Sydnee:** Had niacin in it, and they ate that, and there you go.

**Justin:** That's amazing.



**Sydnee:** Throughout the '20s, Goldberger continued to try to understand– 'Cause he knew that it was a diet-based thing, but I mean, let me make it clear, he did not know it was niacin at this point.

**Justin:** Right. Which probably made it– probably would've been a much easier sell because–

**Sydnee:** Exactly.

**Justin:** Then you can point to a culprit, rather than something amorphous, like bad diet or..

**Sydnee:** And then you can fix it too. And the problem was, the ways that he had fixed it so far were not cheap.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** Giving people meat and vegetables and milk and all the different, like– The good diet that he was giving people, while they needed that anyway, was not feasible. You couldn't just hand that to everyone in the American South at that point.

**Justin:** Mm-hmm [affirmative].

**Sydnee:** So to– If he could isolate what it was and it was something cheaper, that would've been better. So he kept trying to find, like the pellagra factor, what was it that people were missing? He found that whatever it was, it was in brewer's yeast, which was really easy to add to food, but still people resisted. He also figured out that black tongue disease, which was a disease that dogs got, it was the same thing. It was just pellagra in dogs.

**Justin:** Hmm.

**Sydnee:** So, you know, still trying to isolate, what are we not eating? What are dogs not eating? In 1927, the Mississippi river flooded.

**Justin:** Okay.

**Sydnee:** Famously, there was a huge flood in the Mississippi river, and he traveled up and down the river because he knew people then would be, you know, displaced and not getting the proper diet, not getting proper food. And he traveled up and down the river trying to help, like people, like "Get this brewer's yeast in your food. Listen, you're gonna need this, or you're gonna get pellagra." Nobody really believed him. Nobody appreciated it.

**Justin:** Hmm.

**Sydnee:** He was not able to finish his work on his own. In 1929, he got renal cell carcinoma and passed away. But his work did continue. He had inspired scientists who believed that there was something there to keep working, and it was within the next decade that they figured out that niacin was the missing factor. They figured it out first.

A scientist, Elvehjem, gave it to dogs and fixed black tongue disease. They figured out that tryptophan is an amino acid that's a precursor to niacin, so you can just give people tryptophan, and that often fixes the problem.

**Justin:** Huh? That's the turkey one, right?

**Sydnee:** Yes, absolutely.

**Justin:** And milk?

**Sydnee:** Yeah, there you go. And it is very easy to add to foods, so they started fortifying. Lots of breads were the first thing, but lots of foods with tryptophan, and then pellagra was gone. He was nominated five times for a Nobel Prize.

**Justin:** But didn't win?

**Sydnee:** He did not win.

**Justin:** Ah, I feel you. I'm right there with him.

**Sydnee:** I would say a lot of this discrimination was probably, a lot of the things I've mentioned already, because people were resistant to believing him. His wife though did receive \$125 a month in pension, in perpetuity, in

recognition of his service. So, I mean, that was the government's way of recognizing his contributions.

**Justin:** Hmm.

**Sydnee:** His work does continue today, even though pellagra is not something that, as a physician practicing in the US in the modern world, that I see. It is still a problem in developing nations where there are still issues with dietary deficiencies. It's mainly a problem in impoverished areas. And then in refugee populations, this is always some– this is always a huge concern.

And like I've mentioned, there are lots of foods that are rich and niacin, and there are lots of ways to supplement a diet with niacin, it's just, we've gotta get it to people.

**Justin:** Got to get it to the people. Do I start every day with a big slice of niacin? Do you– you ever try that? A little apple butter on there?

**Sydnee:** Nah. I'll take that. Yeah.

**Justin:** Delicious.

**Sydnee:** Now this– I figure this will be our first in a series I'd like to call, like, *Immigrants: They Get The Job Done*.

**Justin:** [laughs] I love it, love it.

**Sydnee:** Thank you, Lin.

**Justin:** And thank you immigrants, for all the medicine and the highlighting the importance of niacin.

**Sydnee:** Yes.

**Justin:** I'm going to, today, lift my self-imposed ban on niacin. I don't know why I've been clinging to it for so long.

**Sydnee:** Honey.

**Justin:** I don't what I was afraid of.

**Sydnee:** You don't have pellagra, so you have not been banning niacin.

**Justin:** All right, doc.

**Sydnee:** You eat a bowl cereal every night [laughs].

**Justin:** That's true. Oh yeah, that's loaded with niacin. I'm fine.

**Sydnee:** Yeah, no. And so everything's fortified now.

**Justin:** Yeah.

**Sydnee:** It's fine. You're fine.

**Justin:** It's fine. That's why you don't need multivitamins. You heard it from me first. That's gonna do it for us here this week, thank you so much for joining us. Thank you to our sponsors. Thank you to the maximumfun.org family of podcasts. You are all excellent.

I wanna recommend one. *Dead Pilot Society* is one I wanna recommend. That is a show where they resurrect pilot scripts that never got turned into TV shows, and do like a stage reading of them. This week is John Hodgman's script, called "Only Child", starring John Hodgman as a 14 year old John Hodgman, and it is hysterical.

So go track that down, and all of the other maximumfun.org podcasts. And thanks Taxpayers for letting us use the song "Medicines" as the intro and outro of our program. Anything else, Sydster?

**Sydnee:** I think that's it.

**Justin:** Well, that's gonna do it for us then. Until next week, my name is Justin McElroy.

**Sydnee:** I'm Sydnee McElroy.

**Justin:** And as always, don't drill a hole in your head.

[outro music plays]

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