**Catherine Walker:** This is Catherine Walker, museum manager at the Royal Pharmaceutical Society Museum for our annual Christmas special. Today we'll be taking a look at pharmacy past, but with a festive twist. I'm joined by Parastou Donyai, who is our chief scientist.

**Parastou Donyai:** Hi Catherine, thank you so much for inviting me to join you.

**CW:** And we're going to be delving into the topic of all things sweet. The weather is getting a little cooler and we're seeing the nights draw in. And it really is the time of year to indulge a little bit. Parastou, do you have a sweet tooth?

**PD:** I do not. Please don't hate me, but I generally love my fruit and veg.

**CW:** I also like my fruit and veg, but mainly in the form of the orange cream quality stream or a bounty. They're technically healthy, aren't they? I'm not really one to turn down a chocolate, I have to say.

**PD:** Um, should I leave now? Maybe we should get together for Christmas dinner, like the perfect sweet savoury dining partners.

**CW:** Perfect. You do the main course, I'll do dessert. How about that? We're going to explore pharmacy's long connection with sweets, but don't worry, this won't get too saccharine as we'll be exploring the sweet and the sour, as the history of pharmacy and confection isn't always appetising. So, who doesn't like a slice of cake? But Christmas cakes and Christmas pudding can be a bit of an acquired taste. Do you like a fruit cake, Parastou?

**PD:** I'd better say yes, regardless of what the actual answer is.

**CW:** I have to say I'm not a massive fan of Christmas pudding, but that's a really kind of Victorian style cake, you know, there's really heavy sponge cakes. So if you've ever had custard, you've probably heard of Alfred Bird because he's the inventor of Bird's custard. Alfred Bird was a chemist and drugist. He's one of the earlier members of the. Royal Pharmaceutical Society, and he opened a shop in Birmingham in 1837. And not only did he invent eggless custard for his wife, Elizabeth, who was allergic to egg, but he also invented self-raising flour because Elizabeth was also allergic to yeast-raised bread. So it sounds like he was a pretty good husband inventing all these different products for his long-suffering wife. He never actually patented self-raising flour. And we're not sure why because he really understood the power of advertising and he made sure to get a contract with things like the Royal Navy. So he made sure to get big contracts. He's obviously quite an astute businessman, but never got around to patenting the recipe. Maybe he thought he didn't need to. It became quite a popular product, the self-raising flour.

**PD:** Wonderful. Sounds like a fantastic early member of the Royal Pharmaceutical Society.

**CW:** Definitely. And given our current awareness of things like food intolerances and allergies, I guess both Alfred and Elizabeth were ahead of their time.

**PD:** Definitely, they sound like a perfect couple, one's the patient and the other one's trying to cure them. There is this kind of misunderstanding though about what constitutes an intolerance versus what's an allergic reaction. I guess when we look at free from products, If someone has an intolerance, it's maybe because they've got difficulty digesting certain ingredients, and then that might make them feel uncomfortable. So they bloat, and they have headaches, that sort of thing. Whereas an allergy is actually something quite different. It's where the body reacts unusually to certain ingredients. And of course, in the case of a severe allergy, this can be life threatening.

**CW:** I don't know if we've got any evidence on whether it was an allergy or an intolerance that Elizabeth got?

**PD:** I think that's a really good question. And I think that does come down to the modern terminology. I think probably allergy was used as more of a capsule term for what we would now separate out into intolerance and allergy. In terms of the pharmacist's work, I guess nowadays, there are some common medication excipients that could cause an allergic reaction or an intolerance in some people. There's a whole plethora of... different kind of categories of these products, by lactose, for example. It's a sugar that's derived from milk and used as a filler or bind it in tablets. That can cause problems for some patients. Or we've got like dyes and colorants, so tartrazine, sunset yellow. And these are known as the Azo dyes. They contain a specific chemical structure known as the Azo group. They can be problematic. The list goes on. I mean, it's not very Christmassy conversation, but let me just finish off, you know, on that list, we've got preservatives, so sulphites or benzoates, gluten itself, which we're aware of a lot more in kind of general life, and that's used as a binder or filler. And again, that won't be suitable for anyone with coeliac disease or gluten sensitivity. And I kind of feel duty bound to also mention peanut and soy oil, and obviously peanut oil is also known as arachis oil. I guess it's interesting because we're talking about intolerances or allergies within pharmacy and really nowadays medicines that have got these excipients that people might be allergic to are obliged to carry an additional warning if they're present.

I want to bring this back, I guess, to some ingredients which either originate or are reminiscent of sweets. And these are put into formulations to improve the final product in some ways. So we've got sucrose, we've got lactose, mannitol, sorbitol, anzylitol, and so on.

**CW:** It shows you how far we've come from the idea of allergies and intolerances and what that looked like 150 years ago and what that looks like now and how thorough pharmacists have to be.

+++BREAK+++

**CW:** So we're going to take a slight turn now. We're going to stay in the Victorian era. But like any good Christmas tale, we are going to take a dark turn. look at an incident that happened in 1858 known as the Bradford Suite poisoning incident. How do you heard of this before Parastou?

**PD:** I can see Catherine, we're keeping in the mood of Christmas here.

**CW:** We are gonna talk about the dark side of sweets now, unfortunately, as the kind of title of this incident kind of implies the Bradford sweet poisoning. So the story revolves around peppermint humbugs, which were sold at Bradford Market by a man called William Hardacre, also known as Humbug Billy. But he didn't actually make these sweets. They were made by a wholesaler called Joseph Neal. And Joseph Neal was guilty of cutting corners slightly in his humbug recipe, because he would pad out the sugar. Sugar was expensive because it was highly taxed. And so he didn't want to spend too much money on the sugar. So he... padded it out with this mix called daft, which was basically Plaster of Paris. And interestingly, that was sold by the pharmacist. He sent an assistant off to the pharmacist to buy some of this daft, but instead of being given daft, the assistant was given arsenic.

**PD:** I mean, if you don't mind me saying that sounds like quite a daft thing to do.

**CW:** Well, what was daft about it was storing both in... different ingredients in very similar containers. You'd think you'd have arsenic in a big red box saying arsenic all over it, but I guess that's why you need regulation, isn't it? To enforce people to make those decisions. And it really was pretty horrific. One lozenge alone had 16 grains of arsenic, which is about one gram. And I've done some conversion and 140 milligrams was enough to kill somebody. at a significantly high dose of arsenic, just one lozenge. And that was one lozenge, and a thousand sweets were sold at the market. 20 people died, 200 people fell ill, but it could be more because those were the numbers that were recorded in Bradford and those sweets could have travelled all over the country.

**PD:** Oh gosh, maybe this is what Alfred Bird was doing. why he didn't have the chance to pattern this product, maybe he was just inventing his own peppermint humbug.

**CW:** Well, it really did pave the way for pharmacy regulation and the Pharmaceutical Society of Great Britain, as the RPS was known at the time, was able to push for legislation like the Pharmacy Act of 1868, which gave them responsibility for regulating the sale of poisons. And so that's when you had things like the importance of labelling your poisons and keeping them in those kind of ribbed bottles so that you'd immediately know when you put your hands on it that it was a poison.

**PD:** Yeah quite right too.

**CW:** And if you ever want to see what a well labelled poison bottle looks like you can come into the RPS museum and see our fabulous display of poison bottles. I do have my favourites without getting too Agatha Christie about it all.

**PD:** Do you have several cameras pointing to the poison bottle to make sure that none go missing?

**CW:** We do. And for the pharmacists out there, we do have the poison register next to them, so you can always write your name in the poison register if you do decide to take some of our poisons away with you.

**PD:** Of course.

**CW:** But next time you hear somebody complaining about health and safety, you can tell them about this story and the importance of this safety regulation. But it does raise some questions. So, Parastou, do you have any insight on why pharmacists would be selling poisons in the first place?

**PD:** I suppose pharmacists have been entrusted to sell poisons versus any other kind of category of practitioner, maybe because of the way that they practice, their accessibility. Obviously pharmacists have been and continue to be well-educated on both the therapeutic and the toxic properties of compounds. They have also expertise in terms of treating poison cases, such as using antidotes, could exert a level of control over people's access to these clearly quite harmful substances to prevent accidental poisoning, as we've been discussing, or even misuse. And obviously you've already alluded to this, pharmacists are very good at maintaining records. So in this instance, it would be in relation to the salem supply of poisons, and yet it limits the sale of poisons to pharmacies, so that... people who need them could still access them for legitimate reasons.

**CW:** But what about peppermints? Is there a medicinal benefit to the peppermint humbug?

**PD:** Oh, where do I start? Peppermint oil, of course, is used in medicines. I guess it's thought of as a direct acting intestinal smooth muscle relaxant, so it can help calm and relax the smooth muscles and therefore help with tummy pain, any spasm, bloating, etc. in people with irritable bowel syndrome. I don't want to carry on the thread about poisoning. But there is also a really famous case used in teaching of pharmacy students, which involves the dispensing error relating to peppermint water. Probably don't want to go into the grim detail of that. This is going back a few decades now. Peppermint oil, it's used as a flavouring agent. So... Antacids, tuber tablets, for example, or liquids like Gaviscon.

**CW:** We'll be breaking out the Gaviscon this holiday season, I think many of us.

**PD:** All that fruit and veg I'm going to have for sure, I'm going to need it too. But you're absolutely right. I think Christmas is a time where people might, you know, over-indulge. But peppermint, I guess when you look at it, it does sound like a miracle cure because you actually, you can have menthol products, which are extracted from peppermint. You can have menthol being applied to the skin for different reasons. And you can also have the sort of menthol in products for nasal congestion and so on and so forth.

**CW:** I'm going to move us away from the dark side of sweets now, because I'm going to give you an 18th century recipe for hot chocolate. This recipe comes from a book that we have in our Scottish collection. has a recipe to treat the plague which involves taking an onion, taking out the middle of it, and pouring treacle inside and a dash of lemon juice. Again, it could be all right. I don't know, I'm not sure about that onion in that. You then roast that onion and add some of the hot ash from the fire into it and mix that all together. And then you squeeze the roasted onion treacle onto the patients. So I'm not sure whether that works very much for the plague except make the poor plague' patient a little bit sticky on top of everything else that they're dealing with. And I think they're dealing with enough.

**PD:** Are they putting these on the sores? I'm imagining that it's obviously the antioxidant properties of the onion or the lemon juice and so on that they're relying on. But I don't advise it. Please don't do it. It's got to come with a warning.

**CW:** If I had plague, I think I'd be going straight to the nearest hospital personally. But in this recipe book we also have a recipe for hot chocolate. The recipe is as follows: you take two ounces of chocolate well rasped, three ounces of sugar in powder, and as much cinnamon, finely sifted, as will lay upon a sixpence. Mix this with a fresh egg, both yolk and white, a little water, either hot or cold. And then when mixed, You put it in your chocolate pot and pour in by degrees, milling at the same time, a pint of boiling water. You then put it on the fire and give it two or three boils, milling it from time to time. That's the 18th century recipe. I do have a little bit of modern day translation for you. So rasping means to grate it and milling means to stir. So you've got to keep stirring. I think if you don't stir, your egg turns into scrambled egg and you get a gross kind of scrambled egg chocolate mix. And if you do want to make this at home, I do have some conversions. For those of you that are not good at converting off the top of your head, two ounces is about 56.7 grams and three ounces is about 85 grams. And from my measuring spoons I have at home, a six pence will probably give you about a half a teaspoon amount of cinnamon.

**PD:** Wow, do we want listeners to make this up? I mean, surely we're not daring them to drink it, are we?

**CW:** I wasn't brave enough to try this myself. There's no milk in it. You have egg instead of milk. And that, I'm not sure, sounds super appetizing, I have to say. I didn't ever kind of work up the courage to try this at home myself, I have to say.

**PD:** It is incredible. And cinnamon powder, sugar, chocolate. egg and like you say, not even milk, it's just yuck. This is not a cure for the plague, but it's in a book for the treatment of plague, is that right?

**CW:** Well, it's in a recipe book. They were known as commonplace books. So it's basically any recipe that the pharmacist or the apothecary really at that time, any recipe they come across, they'd write it in their book. And so you have cures for the plague, also a recipe for hot chocolate. I can't tell whether... there's a sort of medicinal element to this hot chocolate recipe. Can you shed any light on whether it would be medicinal?

**PD:** I was kind of bracing myself for you saying they've put it on the source. I shouldn't laugh because the plague hasn't quite been eradicated, but people who do contract the plague, they do need to get themselves to a hospital. ASAP. Antibiotics, that's the cure that you need. It's not the lemon tree core onion concoction, the hot chocolate would treat a craving for chocolate, but chocolate doesn't have its own positive attributes. I guess there might be some antioxidants in there, but I hate the smell of egg anyway, so I'm not drinking that.

**CW:** Yeah, it could make you feel better to have a hot chocolate, maybe again, maybe not this specific hot chocolate recipe, but I always feel a bit better after a stressful day after a nice hot chocolate. So does chocolate have medicinal properties at all?

**PD:** Seeing that I've let my kind of Grinch-persona dominate this conversation, I want to inform listeners about a warning about fake chocolate. At the time of recording this, this warning was put out by the Food Standards Agency and it seems that fake Wonka bars and prime chocolate bars have raised safety concerns this Christmas. People need to look out for these fake chocolates because really no one knows what might have gone into producing these.

**CW:** But Parastou, do you have any home remedies, any recipes, home remedies you've come across that you still use today?

**PD:** Obviously, anything I say has got to be science-based and evidence-based, but I'm pretty sure I won't get struck off the pharmaceutical register if I share quite a common home remedy with you. And it's actually no other than rock candy, which we call nabot in Persian. There is no scientific evidence for this, but plenty of anecdotal opinion that... If you take nabot and you dissolve it in warm water, then it soothes an upset stomach or even a sore throat. And actually, I'm sorry, I'm going to circle back again to peppermint, but another home remedy is using nabot in mint tea. So you kind of take mint tea and you add that rock candy and maybe you guessed it, but again, that's for helping an upset stomach.

**CW:** It sounds pretty tasty, actually tastier than this hot chocolate recipe, that's for sure.

**PD:** Yeah, no eggs will be harmed in the making of it.

**CW:** Well, thank you very much, Parastou, for joining me exploring the sweet side of pharmacy just in time for maybe a slightly indulgent festive season. Thank you.

**PD:** I'll be really honest with you after my performance last year, I thought I'd be facing a lifetime ban. So thanks a lot.

**CW:** Not at all. Thanks for joining again. I just have to ask, are you going to make any of these recipes at home? Maybe the hot chocolate or a Victoria sponge cake?

**PD:** Without any hesitation, I'm going to say no.

**CW:**I hope our listeners get a chance to enjoy some festive treats this holiday season. And wishing everybody a Merry Christmas and Happy New Year and thanks for listening.