

Maritime Archaeology with Chanelle Zaphiropoulos

Ologies Podcast

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Oh heeey, it's your wallet, which... if I'm so important to you, why do you lose me all the time? Alie Ward, back with a watery, historical episode of *Ologies*. I've wanted to do this episode for so long. Truth be told, I would love to revisit this ology again and again. Perhaps I will. Do you want that? I have a *sinking* feeling that you do. But first, hear the episode.

This ologist is an Ologite as well and pitched the topic to me with such zeal and such passion that I just couldn't wait to *dive* in and hear all *about* it. This Canadian got her Bachelor's in Classical Ancient Mediterranean and Near Eastern Studies from the Memorial University of Newfoundland in Canada, where she was also the president of her scuba diving club, and she's, like, moments away from her Master's in Maritime Archaeology at the University of Malta. (We'll talk about what Malta is later.)

Now, as soon as I learned that her Twitter handle was @SharksandWrecks, I was like, "I gotta know this lady. I need her in my life." She's so enthusiastic about the science and the culture, and her approach to what lost craft represent in terms of history and lives, it's really beautiful. I think you're going to *dig* this archaeologist.

Real quick, though. Thank you to the Patrons who sent in hundreds of questions for this. You can join for as little as a dollar a month. It's 25 cents an episode; cheaper than a parking meter, because my love is cheap. And for no moneys you can support the show just by telling friends and tweeting. You can leave a review for me to discover, since I have read them all and I look for one to pick out each week, such as PandaLover200515, who wrote:

I used to make fun of "Podcast Nerds" but now I identify as one. Ologies is a fascinating show and I can't stop listening.

PandaLover200515, I love you back. Deal with it. And every single person who left a review this week, I read them all, including you, Crash22Awesome. They make 5am wake-up times to finish this show a bit easier, which is what I have done today.

So Maritime Archaeology. Maritime Archaeology comes from '*mare*', which means 'sea' in Latin, and '*arkhaios*' which is 'ancient' in Greek. And there are very niche differences between marine archaeology, nautical archaeology, and maritime archaeology, but this guest is technically a maritime archaeologist, and also this gives me an excuse to do more episodes on stuff that's underwater. Works for me.

Now, she took a break from cleaning dive equipment and finishing up her master's thesis to hop on a call to chat about her love of the sea, mapping a sunken submarine, the *Titanic*, the Bermuda Triangle, pirates, booties, shipworms, the wreck of the *Edmund Fitzgerald*, transatlantic migrations, Atlantis, her favorite ship captain of all time, your new favorite ship captain, thoughts on plundering wreck treasure, and the life that blooms around tragedy. So batten down your hatches and shiver your timbers for a chat with Maritime Archaeologist Chanelle Zaphiropoulos.

Alie Ward: Yes! A shipwreck expert!

Chanelle Zaphiropoulos: My name is Chanelle Zaphiropoulos, or Zap, whatever's easier. And I'm she/her.

Alie: And I'm going to make you say it one more time slowly, just to make sure that I say it right.

Chanelle: Sure. I'll even hold the mic closer. Zaphiropoulos. And the first name's just Chanelle, like the perfume, but Zaphiropoulos.

Aside: Honestly, it's just like it's spelled. It's easy-peasy. Ships ahoy, let's go.

Alie: I've wanted to do maritime archaeology since before this podcast started.

Chanelle: Ah!

Alie: There's not a lot of maritime archaeologists out there, from what I understand.

Chanelle: There's not. Yeah, there's not a lot of us. The cool thing about that is that we all study such unique, different things, which I love.

Alie: Are there different maritime archaeologists who study, like, battleships, and wooden boats, and submarines? Or is it like, "A sunken boat is a sunken boat"?

Chanelle: No, absolutely. I had a professor who is the curator of the Maritime Archaeology Museum in Malta. His super-niche specialty is food. Like, food on boats.

Alie: Really!

Chanelle: Yes, it's wonderful. I love it. But there's absolutely people who are specialists in wood boats, traditional boat building specialists from different regions; so you've got ethnographers, you've got tradespeople who are involved in it, all these fun things. And absolutely, naval historians, like nautical archaeology.

Alie: And do you have to leave the United States to do maritime archaeology, or is there a lot of it in the Great Lakes, or... Why Malta?

Chanelle: So, I'm Canadian, so I wasn't super planning to go to the States to study it. There are a few universities in the States that do grad programs in maritime archaeology...

Aside: In the US, Chanelle says the University of Florida, East Carolina University, Texas A&M, they all have maritime archaeology programs, so... lookin' at y'all, Gators, and Pirates, and Dogs. Oh my!

Chanelle: There's definitely programs in the States, and the States has a great budget for maritime archaeology because there's this, like, military pride, and that's where a lot of funding for maritime archaeology comes from, that naval interest. For me, Malta was the choice because my family roots are from the Mediterranean, so it was a chance for me to, sort of, "go home," and I feel less like a foreigner in Malta than I would have in Texas, I feel like.

Alie: *[laughs]* And you even have done some Maltese boat restoration too? When did that start?

Chanelle: Yeah, so I did not do the restoration myself. My class documented a boat that was being restored in the maritime museum. There were seven of us in our class, and we were the biggest we'd ever had. So, our professor wanted us to document the restoration process that was going on on a pretty dilapidated traditional Maltese boat that was going to be put into the museum. So I mean, with only seven of us, we could all fit into that workshop, we could all ask our questions, we could all take our pictures, which is something you don't get in a massive program.

Alie: Could you all fit in the boat also?

Chanelle: We probably could. It's a pretty small boat.

Aside: This is a small, colorful Maltese boat, and I looked it up, and I was trying to figure out how to say this word, and it's, like, attempting to pronounce the word. I couldn't do it. It's spelled D-G... an H wearing some kind of hat, A-J-S-A. The phonetic key for it was just a bunch of upside-down letters. I couldn't find a video of anyone saying it. Chanelle later told me the name for this boat: dgħajsa. [phonetic: dəɪsə (chg-ang-sah)]

I don't know. She told me it's one of those words you just surrender to copying and pasting. Malta, I love this word. I love you. I'm sorry I failed the pronunciation.

Now, another similar boat is called a 'ferilla', and it looks kind of like a gondola wearing a colorful, flirty paint job.

Chanelle: But basically, this boat was a water taxi.

Alie: Oooh!

Chanelle: So when British boats, like naval vessels, were stationed in the harbor, you got these great, big, huge boats that people were on out in the open sea. They can't really get super up close to land, so you load people into these smaller boats and they take you to shore. Or, in modern day, like taking you across from one campus to another, as I did in Malta, which was a lot of fun.

Alie: And were you always a seafarer of some sort?

Chanelle: Oh gosh. Yes and no. So, my dad is Greek, my mom is Italian. They both immigrated to Canada. I think, as a kid, I had this idea that they immigrated... like, their families came over by boat, and then that was just something that was never discussed. I think my mom actually came over by plane.

Aside: Chanelle told me, as a child, she'd read books about folks immigrating to the United States before her family, who traveled by boat, and she just assumed her family did the same. But she notes that not asking about your family's history is very different than being robbed of that knowledge by forced migration. And her grandfather was on the open ocean a lot, though, traversing the seas to Venezuela for work six months at a time, so Chanelle feels like she has a seafaring constitution. Does she, though?

Alie: Do you get seasick? I'm going to guess no.

Chanelle: I've been seasick, like, twice. And once I'm pretty sure was food poisoning. [laughs] But yeah, I did my undergrad in Newfoundland, and I actually started off in marine biology. So, I was out on this small little boat in the North Atlantic, being tossed around by waves, trying to read instruments and whatnot. You get over seasickness very quickly doing that.

Alie: I bet! Did you start off studying marine ecology?

Chanelle: As a child, I had this romantic idea. I wanted to do everything, and I did not want to compromise. I was very into ballet, and my theory was I was going to work as a scientist during the day and perform ballets at night. [laughs]

Alie: [laughs] A lot of 5-hour Energy drinks.

Chanelle: Yep. And I didn't want to pick one type of biology. I wanted to be a cross-terra biologist, which is something my brother came up with. Basically, I wanted to study bats, I wanted

to study groundhogs, I wanted to study marine creatures. But definitely the marine environment had my heart, hands down. So when I had to pick, there was no debate.

I just always loved the sea. I loved everything about the sea, but I did not know maritime archaeology was a thing when I was younger, so I very much had this idea in my head that I wanted to study the ecosystems that grow on shipwrecks. I don't know how I got this idea as a kid, but I knew this was a thing. And I was like, "That's what I want to do!" And just, like, slowly, slowly worked towards it. Eventually, I was in, like, my final year of university, found out about this program at Malta. I was like, "I'm going to do it! I'm going to apply and see what happens."

Alie: It is such a specialized field, but... This makes me think... because before, if a vessel sinks, someone's like, "Where is it?" You're like, "[*shrug*] Uhahuh... It's in the ocean." But when did we actually start getting to study these shipwrecks? And by 'we' I mean people like you; definitely not me. Was it when we developed sonar, or radar...? How did it work?

Chanelle: Great questions. Yeah, so I actually wrote a paper that was going through for review, and it was a paper on maritime mortuary culture; death at sea. I made this comment about how, like, "Yeah, good luck finding a body at sea." Obviously not like that, but in a more academic sense.

Aside: That 2019 paper, by the by, was titled "Buried in Brine: Maritime Mortuary Practices During the Age of Sail." What even is her life?! It's enthralling, is what it is.

Now, sonar as we know it came about after 1918. It was developed around World War I, but some early uses are said to be in the 1400s, when Leonardo DaVinci, like, screamed into an underwater tube, it's said. And sometimes I'm like, "Did DaVinci really invent all this shit? Or did he just have the best publicist ever?" Good luck finding out.

But back on topic: Marine mortuary science is difficult.

Chanelle: Good luck finding where a particular body drifted in 300 kilometers of sea. So yes, in that sense, it's still very difficult to do that sort of work. Studying shipwrecks themselves, it's happened for a while. We've been doing it in some way, shape, or form for a while. Definitely the advent of scuba gear and sonar just escalated it like crazy. Because we used to have diving bells. We used to have these great big canisters we could lower down into the water with, like, piped air from the surface, and people would work, and that's how they would work on, like, bridges.

So, we did have ways to explore underwater before Self-Contained Underwater Breathing Apparatus was a thing. [*two men simultaneously, but unsure: "Ssscuba... diving?"*] But it was very limited. Definitely, sonar makes it so much easier to locate things. And communications, I would say, is the other big thing.

We know where the *Titanic* went down because we knew exactly how far into its voyage it was when it sank. We knew exactly what sort of latitude it was supposed to be traveling at. And we had communications via telegram if it had deviated. Versus before that, "Okay, a ship didn't make it to harbor;" you didn't find out about that until months later when it was supposed to have come back and it still hasn't. "So, it was supposed to go from England to New Hampshire..." What latitude did it end up with? Did bad weather force it to take a farther south trajectory? So it's like, pretty much, good luck trying to figure that out.

Aside: Okay, the *Titanic* could send texts?? Yes.

In the late 1800s, electromagnetic radiation was used to communicate Morse code wirelessly from ships and lighthouses, and it could travel about 300 miles in the daytime, but double or triple after dark. So, ships could send messages to each other, rich people could send a telegram to shore, probably composing carefully like we do our vacation 'grams to seem both humble but also luxurious. But the channels were flooded with chatter and warnings about ice didn't get picked up, which is the absolute worst possible version of "Did not see your text."

But another ship heard her calls and saved some of the 700 survivors, although 1,500 lives were lost to the sea off Newfoundland, 12,600 feet deep. And the world record for deepest dive of a human hits 330 meters, or around 1,000 feet.

Alie: How far into your studies were you when you got to dive around your first wreck?

Chanelle: Ooh, okay. I was, like, 11 when I started diving. My parents really hoped I would hate it. [laughs] They're like, "Get a nice, safe career, like a lawyer or something." But no, I loved it.

I think I was, like, 13 when I did my first wreck swim-through. I was snorkeling around... or seeing lots of wrecks; I wasn't approaching them. And then when I was 13 we went to this little wreck. Basically, all it was, the cabin didn't have any doors on it, and you could just swim from one door to the next. It was, like, two meters into the wreck. It was like, "Okay, check that off." And then eventually I did wreck certifications and got more into it.

I was in university when I got properly wreck certified. You don't need a wreck certification to dive near a wreck. But to actually go inside, it's a little bit more dangerous, so they require some more skills, and practice, and whatnot.

Alie: Can you tell me a little bit about what maritime archaeologists do? Are they collecting samples? Do they raise the ships off of the sea floor? Or is that very verboten and it's like, "Keep it there."?

Chanelle: You're going to hate me, but I'm going to say it depends. Very classic scientist response. Institutions and governments have different practicing policies in different parts of the world, and it also depends on your interests and your budget. But just the big things. There definitely have been wrecks that have been entirely surfaced: the *Mary Rose*, the *Vasa's* a big one, the *La Belle* that was found in the Gulf of Mexico near Texas. It was a Texas archaeologist who actually surfaced it.

Aside: Just a quick aside, some CliffsNotes. The *Mary Rose* was a 16th-century English Tudor warship that capsized off the Isle of Wight and was raised up in the 1970s. And the *Vasa* is a Swedish warship that sank in the Stockholm Harbor on its maiden voyage in 1628. Thousands of people had gathered to see her off, and rounded a corner, hit some wind, flooded, sank. Now, the *La Belle* sank in a bay off the Gulf Coast in the late 1600s and was excavated in the 1990s.

Hundreds of lives were lost in these wrecks. Millions of artifacts were salvaged. But there are a lot of conservation issues, even if you manage to raise the funds to raise the ship.

Chanelle: They spend, like, millions of dollars on the process of surfacing them, plus the conservation. And the conservation is for a lifetime. It will never stop. You're going to

continuously put money into it, not to mention energy and everything else. So, it's like, how big of a benefactor do you have if you want to surface something? And also, for me, there's the ethics of it. Some shipwrecks don't have a lot of marine life growth on it, they're not having a big ecological impact, so I'm like, "Okay, maybe you can surface it." Some have a negative impact, so you're like, "Yes, do surface it." And some are, like, "No, it's doing more good where it is. It serves a purpose where it is."

Everything in archaeology has an equilibrium in terms of decay, so it's going to reach a certain point where it's no longer going to decay underwater. And underwater, depending on the environment, might be better for it than anything we can do on land. So if it's not in harm by shipping lanes, if it's not in a site where there's going to be development – maybe you're going to put an offshore wind farm there – you might want to just leave it because it's going to cost a lot and it's doing some good where it is. It's definitely a mixed bag.

Alie: And you know... sunken treasure. Did one person find sunken treasure one time and then everyone's like, "Buncha ships out there with gold on it!" Or was that an actual thing, where their banks were, like, in the hull?

Chanelle: I wish I knew more about pirates and whatnot. I know a lot more about corsairs than I do about pirates.

Alie: What's a corsair?

Chanelle: Corsairs are often called "legal pirates," and that's not entirely true. That's privateers, sorry. And then corsairs. Pirates do it for themselves, right? They're the thieves of the high seas. They're looking after their own interests. Corsairs are acting in the name of a country or a religion. They do pillage other vessels, and they do attack other boats, and they do collect literal treasure. In the case of the Maltese corsairs, it was going to the Vatican, so it was funding, you know, Catholicism.

Alie: Wow.

Chanelle: Yeah, but they also did do actual trade. So it might be, like, jewels and coins that they plundered from other vessels that they came across. They might've been like, "Yeah, this load of pottery's going to fetch a pretty penny. We'll take that please." So it wasn't, like, all treasure, but they did have literal treasure chests, and they had three keys to these treasure chests. The captain, I think the priest, and then the doctor all had one key, so you couldn't open it unless you had all three keys, to make sure that the captain didn't steal from it because that was partially going to be your wages, as your crew.

Aside: There are legit piratologists out there, and one day I *will* talk to one, and it *will* be on this show, and I'm excited.

Also, did you know that Florida has a whole coast called the Treasure Coast? Because eleven Spanish galleons sank in a 1715 hurricane. There's millions of dollars' worth of incredibly shiny gold and silver coins out there, and sometimes they just wash ashore, like Vegas jackpot style, only it's Florida, and it's pirate treasure.

Alie: How often is marine archaeology employed in looking for something that was sunk on a vessel? Like, a big necklace or something... for example? [*clip from Britney Spears music video: "But I thought the old lady dropped it into the ocean in the end?" "Well baby, I went down and got it for ya." "Aww, you shouldn't have."*]

Chanelle: In terms of something like that, I don't know if it ever really would. Because like, how much does this necklace have to be worth to warrant the amount of money that you're going to spend looking for it and then excavating it? Because it's not going to just land on the seabed and then 400 years later be right on the seabed. You're going to actually have to excavate it, more than likely, and then go through the whole conservation process.

But for bigger items... Like the Parthenon Marbles that Lord Elgin stole, I think it was, like, three of the shipwrecks didn't even make it to England. They sank. So when possible vessels that were containing them were found, everybody was like, "Yeah, let's put the money in. Let's excavate them. Let's study them. Let's see." because those really did not belong there, and laws and ethics abound.

Alie: I'm sure!

Chanelle: Yes, so people were willing to throw money at that.

Aside: When she said 'Elgin Marbles', I pictured an actual bag of marbles, like in the end of *The Goonies*. But first off, by marble, they mean marble statues of naked Greek deities. And by Elgin, that was the 7th Earl of Elgin, who some say stole and just straight-up looted these statues from Greece. And then they sank in 1802 on his ship the *Mentor*. Then they were fished out later, and now they're in a museum in London. So, folks tend to call them the Parthenon marbles, because fuck this Elgin guy *and* the ship he sank in on... Well, he wasn't on it when it sank in the Mediterranean, where there do seem to be a lot of quality shipwrecks.

Alie: Okay, so Malta. It's little. It's like a little thing, hangin' off of the boot. What is it about Malta that it's just chock-a-block with shipwrecks? Or are there that many shipwrecks all over the world?

Chanelle: There are many, many shipwrecks. I don't know if we could put an actual number on it, but like, millions of shipwrecks all over the world.

Alie: Oh my god!

Chanelle: Yeah. Pretty much anywhere there's water, you're going to find, like, maritime culture. So whether that's in the form of shipwrecks or settlements that have fallen into the sea... I don't say I work with shipwrecks. I say I work with 'submerged material culture'. So that's, like, human things that have ended up underwater, which is a little bit more inclusive.

So, anywhere there's water, you're going to find that because that's something that humans have always needed to survive, be it freshwater or saltwater. Because on islands like Malta, for example, even Newfoundland and Greece, you rely on salt for preservation. So maritime culture is huge. It's super heavily prevalent. It's always a matter of what preserves. So you might not see the shipwrecks, but that doesn't mean they didn't happen, and that doesn't mean you might not find evidence of them, because there's so many factors that go into what gets preserved as a shipwreck.

Alie: Most shipwrecks, do they happen because of weather, running aground, icebergs? What is sinking most of these vessels?

Chanelle: It depends. In some parts of the world, icebergs are definitely more of a concern than they are in other parts of the world. Newfoundland, where I did my undergrad, definitely has a lot more concern with icebergs. There's this whole area called Iceberg

Alley where tourists go every year to watch icebergs actually break off. Very sad, but beautiful.

But yeah, definitely it's a concern there. In Newfoundland, you also have crazy fog, so that's definitely another weather condition, and there have been reports of vessels that just got lost in fog for days and couldn't navigate. And when you have this heavy fog, you don't have wind, so if you're relying on wind power, you can't really get anywhere. If you're relying on oil, if you happen to be going in the wrong direction, you're just going farther away from land. [*"I haven't the foggiest."*]

A lot of wrecks happen in zones of convergence, the channels... things narrow out and you have to go through a potentially more dangerous area. A lot of wrecks happen because of other wrecks. That's something too.

Alie: Whoa! Really?

Chanelle: Yeah, if you think back to when ships had masts... One ship goes down because you navigated wrong, other weather, or whatever, you now don't have five meters beneath you to the rocks, you have a few meters before the mast, the superstructure, all of that stuff. Some more modern wrecks have alcohol being a case.

Alie: Oh yes! The *Costa Concordia*?

Chanelle: Yup.

Aside: The *Costa Concordia*, sidenote, was a cruise ship that sank in shallow waters off Tuscany in 2012. It resulted in 32 deaths and 16 years in prison for the captain, who left the ship high and dry with 300 passengers still on it, and perhaps a lot of mafia cocaine on board. Rumors. They're just rumors.

But while in trial for abandoning his post, he explained that he hadn't abandoned, he'd merely "slipped off the ship when it turned over and happened to fall into a lifeboat," which is like a plot point in an Adam Sandler movie. It's the worst excuse for anything I've ever heard, which is probably why he was sentenced to 16 years in prison.

Alie: I mean, that... Do you think that that was one of the bigger modern shipwrecks of our time? And is it still just hanging out there??

Chanelle: No. They did actually move it. That's the thing, a lot of modern shipwrecks, especially if they're easily accessible, we will try to move if they're not historic. If you can imagine, they still have a lot of oil on board, especially if it happened at the beginning of a voyage. We don't want that seeping out. So that vessel, it wasn't even submerged; they just ran aground. They moved it to, like, a harbor. They moved it to somewhere they could actually extricate it. And a lot of times you can do patchwork repairs, get something floating enough to be able to just tow it ashore and decide what to do with it next.

Alie: Oof.

Chanelle: A lot of times, those turn into artificial reefs. Like, you clear it out, you get rid of the oil, get rid of any, like, seat cushions, plop it back down somewhere else where you need it.

Alie: Does it work to help break the waves as well?

Chanelle: Depending on where you put them, yeah, exactly. It's multipurpose. So, a lot of times, there's... I know of a couple of wrecks off of purposely scuttled US Coast Guard cutters from World War II... it must've been II. They were placed along the US coast so that German U-boats wouldn't go closer because they thought it was treacherous, or

whatever. So, absolutely, wave breaks are a fantastic reason to put them down and a very, very important one because that protects coastal communities that are prone to erosion.

Alie: Ah! So, might as well just toss a boat in there.

Chanelle: Yeah, exactly. If you're not using it anyway. And then, the ecosystem. You get fishermen going out on it, you get tourist dive groups going out to visit it. A lot of times people will see proposals to scuttle these old ferries or whatever, and they're like, "Ahh! It's a waste of taxpayer money!" Look at the potential benefit that it can have. It might actually gain you more money.

Alie: Now, your work in particular, you are studying the *Olympus*, this submarine... This is the site of a shipwreck and it's also technically a war grave?

Chanelle: It is, yes. And this confuses people because I'll... like, whenever I'm talking about it I'll say how there were 112, I think, people on board; 98 potentially made it off. Okay, how is it a war grave to 90-something people or a hundred people? Well, if you don't know where somebody actually died... because some of the crew did make it back to shore, but for a whole bunch of them that didn't, the 90-odd people who didn't, we don't have any one place to actually tie to as their final resting place, so we use that closest proxy, the place that had their belongings, the place that they should have been, this is what we relate to as their final resting place. So, it's a war grave.

It definitely is a war grave for the eight or so people who didn't make it out, but for everybody else who didn't make it to shore, that's what we will still consider as a point of respect for them.

Alie: What type of work, and diving, and investigation do you get to do with it? Has anyone entered it, or is it completely sealed? How does that work?

Chanelle: Great questions. I don't get to do any diving on it, unfortunately. It's 115-120 meters deep, so... You can do an aside with the conversions of that. I'm very metric.

Aside: The *HMS Olympus*, just some stats on that. World War II sub. It's 86 meters long, six meters wide, and it hit a mine and sank, killing 89, but it yielded nine survivors who swam seven miles to the shore. And its location was discovered in 2011, about 115 meters below the surface, or about 350 feet deep, which is deep.

Chanelle: So, for reference, I've been diving for, like, 15 years and I'm only really qualified to dive to 50 meters, so not even half of that. The people that do dive down to it, it's like an eight-hour trip. They have to come up so slowly for their own safety, and you only get, like, 6-12 minutes on the bottom, depending on how long your ascent's going to be. So, there's not much excavation that happens on that site, partially because of this limitation, but also because it is a war grave and there are laws in place around it, especially because it's a British war grave.

Because again, every country has its own laws. So for us, it's very much a look-don't-touch approach. So, I work entirely from videos brought up by other divers, because there are divers who can reach it, just not me. This is where it becomes a community approach, because I can't do it myself. We can go down with ROVs, remotely operated vehicles, and collect some data that way. It's, to my experience, not as good quality as what gets collected by hand.

Aside: Why is that? Well, an ROV can be a little herky-jerky, depending on who is operating it. So, imagine your dog grabbing a toy versus, like, a ghoulish Boston Dynamics canine cyborg. It's just a little uncanny.

Chanelle: I don't know, sitting and watching that video, you hear the machinery moving, there's this bigger presence in the video... And perhaps this is all in my head, but I mean, the fish react to it. Fish do not like this huge thing with lights everywhere, making all this noise, so they act very differently around the ROV than they would around divers.

"If you can, maybe try to get images of this, and try to look at the attachment structures." I get to, theoretically, direct where people can look, and then that will impact the quality of the footage we get, too, because that means I can do specific analysis, which would be so much cooler.

Alie: What exactly are you looking for? Like, you've sent a diver down, they've got 8-12 minutes with a sunken submarine. I feel like it's one of those grocery shopping games where it's like, "Grab as much as you can and get out of here!" [*"Everyone's favorite, guiltiest pleasure!"*] What are they looking for?

Chanelle: Pretty much. A lot of divers that go down, they just want to swim the length of it. They're there for the experience. They're not there working for me; I get this all secondhand, so I have to be very delicate with any requests I make. A lot of them, they're... like, this is an Everest. They just want to experience as much of it as they can. So, in terms of archaeologists, because they have tried to study it... One of my former professors actually wanted to do 3D models of it, because that is how we study underwater wrecks by proxy. We can't go back and visit a site just whenever we feel like it because it's, you know, hours away from port, it's underwater, it's so expensive, you need a whole crew. You can't just go out for a walk and visit the shipwreck. You need a crew of ten people.

So, what he wanted to do was create a 3D model, and because of the organisms that are on that specific shipwreck, the 3D model does not work. So what I do, because I have a background in marine biology, is I, ideally, would get to say, "This species has formed here, and this is what this species looks like..." so I'm creating what's called an ecomap of the wreck itself, and we have a baseline so we can see, with continued diving on it, does it cause damage? Are they benefiting from the increased oxygen? Are they moving? How is this wreck... because it's a dynamic site, how is this changing over time?

Aside: I was curious to look up exactly what grows on the *HMS Olympus*, and google return found me a paper titled, "The Deep-water Ecology of the HMS Olympus: An Analysis of the Archaeological Impact of Marine Growth on Submerged Material Culture Beneath the Photic Zone," and I was like, "Snap! Does Zap know about this?"

Turns out, its co-author is indeed Chanelle Zaphiropoulos. So, looking at photos of the sunken submarine, it's kind of bedazzled with fan corals, and growths, and surrounded by flickering pink fish that dart around it. And Chanelle deals with the difficulty of making 3D models of something so encrusted, and also looks at the ecosystems that thrive outside it. But what about inside?

Chanelle: Entering a submarine is, like, nigh on impossible in terms of safety. This one has two entrance-exit points. So you never want... because it's a war grave for one. But on top of that, this one is somewhat safe because there's the blast point where you can enter, and then the hatch is actually open. If only one was available, you wouldn't. It's too risky. But even so, because it did undergo an explosion, we have no precedent. Like, I can't say it's

safe. I have no clue how the structural integrity of that site is after all this time underwater, plus having gone through an explosion.

Alie: In terms of maritime mortuary science, is that across the board if there is someone who passed away on the vessel, or if it's considered a grave, it's hands-off?

Chanelle: So, in terms of war graves, it's hands-off. But they basically decided that war graves of all sorts have the sovereignty of the nation that they belong to, and that's... all the signatories have decided, "We're going to give them this respect," so you can desecrate the grave or anything else. That does not apply to merchant vessels. Or if a fishing vessel goes down, there's no protections in place, which sucks. Really, really sucks.

I am of the opinion that every, sort of, site of death should be respected. It's not like I don't want people to visit them, I just don't necessarily agree that you should be going down and taking things, or making funny face pictures with, I don't know, ship propellers. I don't know.

Aside: I went on Instagram and got sucked into the watery abyss that is #WreckDiving, and there are some beautiful photos of all kinds of humanity's tragedies, and foibles, and scuttled ships. But there are also a lot of people just... taking windows, and bottles, and portholes to keep as décor in their backyard, on wrecks where scores of people died. And, I don't know, it seems weird.

Chanelle says that she's met many divers who kind of shrug and say, "Ya know, if archaeology is for everyone, then why can't I take it? It should belong to me as much as anyone else." And she says that beyond drawing the distinction between humans belonging to heritage and not humans *owning* heritage, the best response she says she's been able to find is that by removing artifacts, they stop it from being accessible to as many people as possible.

And one thing that's eagerly sought from wrecks is a ship's bell, which is engraved with her name. And the Titanic's bell was recovered from the seabed in the 1980s. And I don't know, for some reason it just gives me shivers to think about it above the surface again, kind of like seeing a ghost or an eerie resurrection. But those bells can mean a lot to survivors or relatives of survivors of the wreck and are rung at certain times in memorial.

Alie: That being said, how do maritime archaeologists feel about, like, the *Titanic* effect? And you know, James Cameron, and shipwrecks as entertainment or lore? What's the general feel toward that?

Chanelle: There's good and there's bad to it. If you've shown that there's a public interest in something, it's easier to get funding to study it or preserve it. But there's also the people who will see that and be very interested in it, and see that nothing's happening to it that they can see, like... You know, an archaeological site on land might have a fence up around it. Nobody's putting a fence around a shipwreck. We can't do that. We can't put guards at them. We can't put park rangers. So, a lot of people will see a shipwreck and be like, "Oh yeah, cool. This is here, it's just going to be damaged by time. I'm just going to take it with me," which is not always a good thing to do because a lot of times we see unexploded ordnance going home with people.

Alie: [warped] Unexploded ordnance?

Chanelle: Grenades, or even just bullets.

Alie: No!

Chanelle: Those are... Like, the gunpowder is inert when it's wet, but as it dries, even a bullet could... I've seen things get put on mantles. I'm just like, "Oh, I'm very, very, very worried about the heat from this fireplace." Even just the bullet exploding could cause a heart attack, I can imagine. I just cringe.

Alie: Oh my god! That is nuts. Someone's like, "I found this cool shell!" And you're like, [*nervous singsong*] "That's a grenade..."

Chanelle: Yeah, because it's all concreted, it's got organisms growing off of it. You have no clue. Most of us don't even recognize what a gunshot sounds like because they're altered... because they sound so fake that they're altered when we hear them in, like, movies and things. Same thing goes... We don't understand what a grenade looks like, especially not when it's been through this process.

Alie: I have so many questions from listeners. So many, and they're such good questions. Can I lob some Patreon questions at you in a lightning round?

Chanelle: Yes, absolutely.

Alie: [*squeal!*]

Aside: But before we do, a quick word about sponsors of the show. They let us donate to a good cause each week, and Chanelle chose Diving With a Purpose, DWP. And DWP educates and empowers traditionally disenfranchised people as community scientists. They started with members of the National Association of Black Scuba Divers, and they train young divers between the ages of 16 and 23 from diverse backgrounds as Underwater Archaeology Advocates. So to find out more, you can go to DivingWithaPurpose.org. A donation to them was made possible by some sponsors of *Ologies*.

[*Ad Break*]

Okay, back to underwater nautical inquisition.

Alie: We can skip any that you want to, but a lot of folks, Claire Meyer asked this, David Obi, first-time question-asker, Katy V, Ruby Johnstone, Mo Casey, BugsAreRad, they all wanted to know, in David Obi's words: What's the number wreck you wish you could freely explore but you can't? Ruby asked: Is there an El Dorado of shipwrecks, like a mythical ship that has yet to be discovered? Is there one out there that people are like, "WHERE IS IT"?

Chanelle: Oh my gosh, I feel like every ship is that until it becomes discovered. And the thing is, even when we discover a shipwreck, a lot of times we don't know exactly what ship it is until, like, years of study. Which is super cool.

Alie: Really??

Chanelle: Oh, yeah.

Aside: The *HMS Olympus*, for example.

Chanelle: We can tell from the sonar images that it's a submarine, but there's a few different submarines that went down, potentially, in that area. Because again, we don't have... It's not like when a flight goes missing, you've got the black box radar for the last place. We don't have that for older ships. So, you do all this detective work before you can dive

down to it because most of us don't have the budget to just be like, "Yeah, see ya later." ["*Anchors away, ladies!*"] So it's like, "Okay, it's this long, it's this wide; that's these different classes of vessels. And we can see this feature, so that gets rid of all these different categories..."

So there's all this narrowing down, and like with the Olympus, they actually dove down and they could see... It had its symbol on the actual hull, and you're like, "Yeah, this is the Olympus." It matched with the survivor records. They could see that the damage to the hull was at the spot that the survivors said it was. You don't get that most of the time if you don't have survivors. Even when we find a shipwreck, we don't know what it is.

Like, the *La Belle* is a classic case of one where this archaeologist spent most of his career looking for it, and I think the year before he retired was when he finally found it. One of my personal heroes is this Greek naval captain. She actually went on to be, like, the first female lieutenant in the Russian Navy. Her name is Laskarina Bouboulina, and she fought during the Greek War of Independence. And part of me is like, I would love to find any wreck that's associated with her. Probably not going to happen, and that's okay.

But basically, because wooden shipwrecks, when they're damaged in conflicts... There's a few ways that can happen. You either would try to damage their mast or their rudder so that they can't navigate and then you try to board a vessel. And this goes for corsairs as well. You try to board a vessel, and then you claim it because boats and the cannons on them are so expensive to make and so labor-intensive – a good ship you can use for years on end – so, you don't actually want to, like, just destroy it to smithereens, which you see in a lot of movies. Like *Pirates of the Caribbean*? No.

Alie: No, I'm sure.

Chanelle: *Master and Commander* is a pretty good, like... It's not underwater archaeology, but it's maritime history, so that's a pretty good movie. Sorry, it just came to mind.

Alie: I want to watch it now.

Aside: Since recording this, I did watch it. And I'll be honest, I was in a mood, and I was like, "I hate watching all these smelly guys yelling at each other. I'm over it."

But also, getting back to Admiral Laskarina Bouboulina for one second. This lady was born in prison. Her father was a revolutionary. She grew up, she had a seafaring husband who was killed by pirates. She took over his shipping business and had more boats built, including a giant warship called *Armageddon*, which is not a subtle name. And she died in a gun battle with her in-laws! Paintings of her look like the teacher in high school you're terrified of, who also taught you the most and you liked the most.

So what happened to her eight ginormous ships?

Chanelle: If they actually did get blown to smithereens, or damaged beyond repair, wood floats a lot more than metal would, so it would just sort of disperse before actually sinking, which is not something you see in, like, a weather catastrophe or something that runs aground. Something that runs aground and takes on water will sink, more or less, intact and have a very small debris field. Wood, in small pieces, it's going to float. It's going to spread a lot more and not sink as much. So it's going to be more scavenged by marine life, and worms, and everything else.

Alie: It's funny, because you think about all the wooden ships that have sailed for centuries, and you're like, "Yeah, where *did* they all end up?" It's not like there's a big ship

junkyard with all of them, you know what I mean? They must all be out in the sea... somewhere.

Chanelle: Yeah. That's the thing, a lot of people are like, "There's so many..." I'll tell them there's, like, an infinite number of shipwrecks, so many I can't put a number to it, "How? Haven't we sailed forever?" Yeah, but a good ship is going to last decades, and anything that's old enough, eventually is going to fail, you know? Or it gets repurposed, and wood just doesn't survive. Wood decomposes like crazy.

Alie: Mm-hmm. That makes so much sense. You know, Alia Myers had a question. They asked: What about planes? There's got to be planes in the ocean, or cars, or submarines, helicopters... Other vehicles must be down there. Is anyone looking for them?

Chanelle: Definitely. Yeah. That's one of the things, I like to use the term 'wreck' because that's more of an encompassing term, because anything is wreckage, whether a train wreck, or... In certain parts of the world, there are lots of cars underwater. I've done side-scan sonar surveys along coastal, like, roads, and wherever there's a sharp bend in the road, I can see a couple cars on the sonar.

Some of them we know because we get stories of people who don't want to pay to take it to a junkyard. Like, it's a piece of scrap and they just, sort of, run it off the road. Sometimes you know that's there's accidents. Sometimes there's been cases where they've had to be investigated by police. So yeah... And then there's also... This happens a couple times a summer in Greece, and I'm sure all over the world. Cars that fall off of ferries. Like, just missed the ramp.

Alie: Oh no!

Chanelle: I've seen it happen. So, they're right in ports. Yep.

Alie: Now, if you see a car underwater, do you mention it to anyone, or...?

Chanelle: It depends on the area. We will try to get as much detail as possible. There's areas where we know that it's a known, sort of, refuse spot, so we might mention it to environmentalists, like, "Okay, something needs to be done." If it's new or if it's a blip, or especially if we know there's somebody that did go missing in an area, we will absolutely mention it. Typically we don't like finding bodies, we don't like working with bodies, so any case where we might find one, it's not entirely our job to do that retrieval and we will definitely make sure that people get it.

But yeah, airplane wrecks, very cool. The overlap between, like, aerial archaeology and maritime archaeology is super big because a lot of the war planes that have gone down, WWII planes especially, a lot of their records of how they were built got destroyed following the wars. Like, burnt, or like, "Oh we don't need these anymore. Scrap them." So for a lot of different types of airplanes, like historically significant biplanes and things, we have no clue how they were built. So when they get preserved underwater, that's like our only chance to study how they were constructed.

Alie: Ooh! That's cool. So it's kind of like taking apart a sunken Ikea bookshelf and trying to figure out how you piece it together.

Chanelle: Yeah, pretty much.

Alie: That's one way to do it.

Aside: Just a few, for those taking notes. The 1941 Blenheim and the 1943 Bristol Beaufighter both sunk off the Malta coast, and the crew of the latter were rescued by those water taxis that look like a bad Scrabble hand I can't pronounce: dghajsa [*struggles to pronounce*]... like a ferilla, essentially.

There's also the Micronesian Chuuk Lagoon, which is a formal Japanese naval base that Jacques Cousteau explored, calling it "The Lagoon of Lost Ships." And for some vintage documentary vibes, look for his 1969 film. [*clip from film: "Further exploration suddenly yields an unexpected find in the northwest anchorage of the lagoon."*]

Now, speaking of yore:

Alie: A ton of people asked about age of shipwrecks, like first-time question-asker Sammy Baker, Mardee Goodwin, Cheyenne Spencer, Kayla Gunning, Gavin, Hilary Larson, Ned Lansing, Earl of Greymalkin, Chris Alfonso, literally all these people, Diana Burgess, Laura Stacey, and first-time question-asker Lauren Cooper who asked: What's the oldest shipwreck you've ever found and how pants-shittingly cool was it? But in general, how far back can we date them?

Chanelle: Yeah, so it depends on the wreck, definitely. That annoying, typical science answer: It depends. We've got a lot of different materials that are at our disposal, resources at our disposal to age them, and one that everybody knows is carbon dating. We *can* carbon date shipwrecks, some of them. Depending on the age, we'll decide how accurate that carbon date is, which is still super cool.

Water typically doesn't affect our ability to carbon date unless only part of the wood has been decomposed, like the organic matter. Sometimes you have conditions that the inorganic component of wood stays intact and you're like, "This is awesome. I've got great wood." And it turns out all the organic matter is gone, so you can't actually carbon date it very well.

Aside: Quick aside, chemistry fun fact. Organic matter has carbon, and C14 dating is only applicable to organic and some inorganic materials, but not applicable to metals. WHAT! I didn't even realize that. But you *can* use it on things like wood, and bones, and leather, and pottery and such.

Chanelle: Typically we can carbon date, but that's only one source that we'll use because carbon dating has a pretty big error factor, like plus or minus so many years. And then plus, you add on to that the fact that the carbon date is not the date the ship sank. It's the date that the tree was cut down. [*"WHAAAAT!"*]

So, depending on where in the world the timber is from, they have different methodologies for building ships and for harvesting timber. You might have trees going into building a ship from 15 different seasons, 15 different years. And then on top of that, you might have wood that, sort of, sits in a shipyard or gets seasoned for X-number of years before it actually gets built. And then the ship gets used for so many years before it actually sinks. So, the date that you get might be 100 years before the date that it actually sank anyway.

So then there's all these other methods that we use. One of the big things would be looking at what's actually on the shipwreck, whatever was in the hull, the materials it was carrying. Things like amphoras, and bottles, and coins all have very stylistic changes that are very unique to different places and time periods, and that's one way that we can track the age of a shipwreck.

And then you get what I'm doing. Sea creatures, especially hard-shelled sea creatures, grow at set rates. They've got growth rings in their own shells. This is called sclerochronology, and this isn't exactly what I'm doing, but it feeds into that. So, there's this idea that the coral reef, or the ecosystem that's growing on the shipwreck, can help indicate how long it's been there. We can, sort of, back date it. So my site, I know it's only been there for 75 years. I know that... I have a rough estimate of the growth rate factors for all those organisms, divided by 75 years.

Aside: So maybe the wreck is 200 years old, but the coral is a spry 50, so she can find a shipwreck at a similar depth and compare notes on the living critters to get a rough estimate. Kind of like a Wreck Detective. A Wrecktective.

Chanelle: So you'll typically look at all these different factors, as many as you can, and crunch them together to figure out, like, where as much overlap as possible within all your different dates is, and then that gives you a more narrow time period for the ship's actual sinking.

Alie: Ooh! That's some detective work! Sclero... chronologists, or...

Chanelle: Yeah. You should absolutely do an episode on that.

Alie: I know! Don't think that didn't lodge itself in my li'l brain. I was like, [*slyly*] "Never heard of that one..."

Chanelle: Because everybody knows what dendrochronology is, which is super cool, but this is like dendrochronology on living organisms, which is also super cool.

Alie: Ah! Amazing. Annual growth rings: who knew? Who knew!

Okay, a lot of people had a question about: What is the most interesting find on a shipwreck, in your opinion? Amanda Kriss says: First-time question-asker, long-time listener. What is the most fascinating discovery or item on a shipwreck and why is it the [*struggles to pronounce*] Antikathighrrra... mechanism.

Chanelle: [*laughs*] Okay, chef's kiss to you. I knew somebody was going to ask this.

Alie: [*laughs delightedly*]

Chanelle: So, in Greece, you have a lot of bigger islands, and then you have a smaller island opposite of it, and because they're part of the same municipality, you don't give the smaller island its own name. It's 'the island opposite that island'. That's where Antikythera gets its name because it's 'opposite Kythira'. A smaller island just off the coast of Kythira, which is another island. And that's where I mentioned the Parthenon marbles had sunk.

So, the Antikythera mechanism is often called the world's first computer. [*Alie gasps*] It's basically, like, four clocks. I think there was one that they think was every four years instead of every 12 hours, so they speculated that it tracked the Olympics. I don't know the validity of that, but it also has evidence that it may be linked to astrological... astronomical – I'm dyslexic so I get them confused. But it was theoretically something that helped navigation, because in order to track where you are at sea, you need to know the time and where you are.

If you're looking at the night sky, if you're navigating via the sky, you need to know the time because that's going to decide where in the night sky certain things are. And so, depending on the angles they're at compared to the horizon, and if you know the time,

you know how far you've traveled from your origin. So, you get into, like, the quantum physics of, like, knowing spacetime and everything else, how they figured this.

Aside: Picture a box with brassy cogs and wheels, and astrological symbols, but corroded and fused into one rocky blob.

After its discovery by some sponge divers in 1901, it sat around for a few years because no one really knew or cared that this was possibly the first analog computer to predict eclipses and such.

Alie: This was sunken on a vessel?

Chanelle: Yes. There's a whole bunch of rumors behind it. I don't know how much of it we actually know for sure, but I know some theorize that it was... because it was a Roman vessel, we know this. And it was traveling through the Greek islands. Some people think that it was on its way to Julius Caesar. Don't know the validity of that. Some people speculate that it was designed by, like, the father of trigonometry, the guy that came up with the first trigonometric tables, which sort of tracks if he's figuring out all this navigational stuff.

Aside: I looked this up. It was a dude named Hiparcus, from about 150BCE. But yes, no one cared at first, and *then* they were like, "Oh, this is bananas. What is time? What is life? Would anyone like to buy a sponge?"

Chanelle: But yeah, so that's a very cool mechanism. That's cool because it's the only one that we've found like it, and it's, sort of, standalone in space and time.

The coolest things, I think, are always the things that show us about their daily lives. It's always going to be the things you don't expect, but anything that tells you about the daily life. Because as an archaeologist, we are interested in people's culture and how they spend their time. So absolutely, whatever the captain has, whatever fine china he might have in his cabinet is neat, but when you find gambling dice on a shipwreck from a period and a time that you know that gambling was prohibited, that's pretty neat too. Or like finding clay pipes, like... Oh my god, you find clay pipes everywhere. Like, we now also understand why tobacco is still such a big thing today, because it was omnipresent in the past.

Alie: You know, a lot of people had questions in that realm. Like first-time question-asker Dilettante Cosplay, and Robbo Chamblay, and Emily Okerlund, Natalie Rhoades, Rachel Casha, Zoe Jane. I love these questions. Sarah Crowder... They all wanted to know about eating things that have been jarred in a shipwreck, like shipwreck wine, and can you snack on stuff after bringing it up from the ocean floor?

Chanelle: I don't know if you would want to with some of them. The really cool thing is... I would love to be able to try some Roman wines. You see about these Roman wines that they pull out of places in Pompei and extract the formula from the inside of the vessel, like the amphoras and stuff. We can do a lot of that with shipwreck materials. Because clay amphoras collect... they absorb whatever's stored within them, we can do, like, thin section analysis of the inside of these amphoras and figure out, were they holding olive oil? And potentially even where that olive oil was actually from. Was it this famous fish sauce that was, like, a major trade item in the Roman empire? Or was it wine?

The thing is, we can't actually try the actual wine because one of the biggest mysteries we still have is how amphoras were actually corked, or sealed, because these big clay jars are very heavy and they sink to the bottom. So, shipwrecks that had clay jars rather

than barrels... That's the thing, we think clay jars, they're very old, and barrels are much more modern, but there was overlap between the two in terms of production and use. But shipwrecks with barrels don't preserve as well because they don't have the weight that pushes them into the sediment to protect them from organisms. And the barrels themselves then decompose.

So it's like, we have no clue what these shipwrecks were carrying if we do find them because the barrels are gone. But these amphoras, we can actually figure out if they were carrying, like, wine, or oil, or whatever. I don't think we have enough evidence from that to be able to recreate it because they get uncorked and everything washes out. So, literally all we have... We don't even have remains. All we have is, like, whatever tiny little amount was absorbed by the clay.

Alie: Wow. That's so interesting. I wasn't sure if they would just stay sealed.

Chanelle: And that's the thing, we don't know. Because the theory is that they were somehow corked, there was some sort of piece of wood put on top and they were sealed with wax. And if that's the case, the wood would theoretically decompose or maybe even get dislodged. Lots of them crack, you get the necks cracked off. But yeah, some people even theorize that it was just, like, waxed oilcloth just tied around the neck. Not super secure in the turbulence of the sinking. That's one of the biggest mysteries that we still have about the ancient world. "How the heck did you seal these amphoras?" A super mundane question.

Alie: Oh, I never knew they were the mason jars of yore! They were everywhere. Hipsters used them in seafaring bars.

Chanelle: Oh my gosh. The funniest thing is that... Because amphoras and the stamps, the designs they had were unique to different regions, and you actually had people stealing the used ones to make, like, counterfeit. So like olive oil from Greece was super expensive, so maybe you get Spanish olive oil producers stealing the Greek olive oil amphoras, putting their olive oil in it, and then selling it for twice as much. Shit like that went down a lot. It's super cool.

Alie: Oh my gosh! You got ripped off! Oh, man!

Aside: So we didn't know how these huge amphoras were sealed, and also, confession... I need to get this off my chest. I used to waitress at this bar-restaurant, and the owner would refill the Tanqueray with Gilbey's Gin, which is not good gin. And we had one customer who could always tell and would make me crack open a fresh bottle for her. And I always wondered if she was, like, a bloodhound in a human costume, or a secret spy. But then again, if you put Pepsi in a Coke bottle and you tried to pull that shit on me, I would call the FBI. And I've never told anyone until now about that Tanqueray switch out, because you know what they say: Loose lips sink ships.

Alie: We got a lot of questions about my dad's favorite song. Megan Stingle, Gwen Zimmer, Vanessa Fry, BolognaShoes, and Emily Stanislawski, and also I'm going to guess my dad, Mr. Larry Ward, want to know: Does everyone ask you about the *Edmund Fitzgerald* after finding that you study shipwrecks because the song is already stuck in my head. Gwen wants to know: Is it your favorite song?

[clip from Gordon Lightfoot's "Edmund Fitzgerald"]

*When supertime came, the old cook came on deck sayin'
"Fellas, it's too rough to feed ya"
At seven PM, a main hatchway caved in, he said
"Fellas, it's been good to know ya"*

So yes, how many times have you heard it?

Chanelle: Many times. I love Gordon Lightfoot. He was fantastic. One of the greats. Yes, it's a fantastic song. I'm terrible with lyrics, so I had to actually sit down one day and actually look at what was being said because I used to play music and I... between playing instruments and being a dancer, I was like, "I don't listen to lyrics. I have all this other stuff going on in my head."

It's a fantastic song, and I think it's a great example of how broad maritime culture is, because music is a huge part of it. When you look at sea shanties and whatnot, it's basically a sea shanty. It's, like, a love song to a ship.

Aside: So Gordon Lightfoot is a Canadian folk song hero, and he wrote this in 1975 after seeing just a little blurb in the back of a *Newsweek* magazine about the *Edmund Fitzgerald*, which sank in a November storm. And Lightfoot recalled that they spelled 'Edmund' wrong in the article, and he was just so sad that 29 lives – all crew members were lost – could amount to just a little afterthought in the news. So he wrote that ditty the next week and the world has remembered her ever since.

And the ship's victims remain with the were in the cold, cold, cold waters of Lake Superior, who they say never gives up her dead. It's cold enough that they stay pretty well preserved and wouldn't float up by decomposition. But the bell of the *Edmund Fitzgerald* has been retrieved at the behest of family members and has been rung in memorials, some of which Gordon Lightfoot has attended.

And he also set up a scholarship fund at Northwestern Michigan College where two crewmen were cadets. So yes, GrandPod Ward: He has good sea song taste.

Chanelle: And it's like... it's not even a ship from antiquity. It's, you know, a freighter from the Great Lakes from, what was it, 1975 or something like that? It's recent! And I love that. I love that it inspired somebody so much to create this, like, absolute jam.

Alie: It is! What a bop. It's a bop of maritime antiquity.

Chanelle: [laughs] Yes. It's fantastic. I love any sort of sea shanty, so... or any song about the sea is fantastic.

Alie: It really makes me want to raise a mug of rum or something.

Chanelle: Yes.

Alie: We got a lot of questions... Murray Moss, LungOx, Rachel Selby, first-time question-asker Lisa Baik, Aspen, Felix Lasselle, Jacklyn Watson, Julie Nguyen, Kelsey Story, Katie Kelly-Hankin, Shelley Carr, All Agog, Laura Stacey, Ira Gray, Benjamin, a lot of folks... I might even be missing some. I'll list them in an aside.

Aside: Amesia Doles, Sam Kilgour, Adam Palik, Sarah Feip, first-time askers Luke, Samantha Norris, Paul Cirillo, and Alena Litin. These folks all asked about ship critters, and some more specifically.

Alie: ... want to know, Murray asks: What's the deal with shipworms? What are they? LungOx: Not directly related to shipwrecks, but I'm very curious about shipworms. And Lisa Baik wants to know: Do any wildlife and animals take advantage of a shipwreck?

So yes, tell us about what's livin' in 'em!

Chanelle: So many animals and wildlife take advantage of them. Depending on where in the water column a ship has settled, and depending on what material it is, different organisms are going to be attracted to it. So, obviously, shipworms are more attracted to wooden shipwrecks. They're virtually going to leave metal ones alone because there's nothing for them to eat. Shipworms, what's the deal with them? They're not even frickin'-frackin' worms.

Alie: WHAT!

Chanelle: Let's start with that. They are the bane of most maritime archaeologists' existence. So yes, basically these mollusks; misnomer to the extreme. I hate it; I love it, whatever. Not worms. They originally lived in what's called the littoral zone, close to shore. Basically, they would've feasted on, not just ships, obviously. They're not this organism that evolved just because of ships. They have more recently in the sense that their distribution has broadened because of ships because they were picked up from one area and deposited elsewhere. But they didn't come into being just because of ships. They just capitalized off of them.

So I mean, piers, anywhere you've got... You're in California, you've got those beautiful piers into the sunset with, like, Ferris wheels: Shipworms all over them. People have to replace those timbers, anything that's underwater, because of shipworms.

Aside: What do they look like? Kind of a pale, flabby hose, to be honest, with a pair of bony castanets on one end that they use to rasp their way through things. And they also have some feathery, gill-like fancies at the other end. And they might be a meter long, just a three-foot-long, wood-boring dick bag.

Alie: Wow...

Chanelle: So, they are virtually everywhere throughout the world. The only waters that are immune to them, I would say, are at very high latitudes, so where it's too cold. And that is something that is changing with climate change, unfortunately. So, ships that used to be beautifully well-preserved, wooded shipwrecks that used to be like... we're like, "Yes! You guys are doing it! You're surviving the test of time!" In the North Atlantic, where I am, or the far south, we now need to actually monitor them and be careful about shipworms. It's this whole thing, like, "What do we do if they do make it here?"

There's a few different things that you would do. Like, shipworms don't... they need oxygen, and that's why the Black Sea is actually one of the few places that's not super, super cold that's immune to them, because you've got a very thin layer of oxygenated water near the surface, and then below that it's super anoxic.

Aside: Anoxic: Not a lot of dissolved oxygen in the water.

Chanelle: So the worms just can't survive. So if a ship sinks quickly enough in the Black Sea, it won't be affected by shipworms, or it shouldn't unless that also changes with climate change, which is possible. I'm not an expert. But yes, so if we cover shipwrecks with at least a few inches of sediment, they can't get accessed by these organisms.

Aside: But slathering wrecks in sediment isn't a best-case scenario, and Chanelle says that if something is still fairly intact with tall, pokey masts sticking up, you'd need meters and meters of mud to cover that. But what types of other critters and plants see a shipwreck and are just like, "Lunch!!"?

Chanelle: Lots of organisms. There are entire ecosystems. Anything that needs a hard substrate to settle off of loves a shipwreck, because you've got what's sort of an ecological desert. You have whole swaths of the sea floor that's just silt and sand, which has its own ecosystem, but none of these invertebrates that need this hard substrate, that need, like... It's like putting down the foundation of a house. It's not really great in muddy water, or like, marshes. You need concrete sometimes.

And then once these, sort of, reef ecosystems grow, bigger fish, reef fish, sharks, everything comes to it. Everything loves it. It's great. I love it. I'm like, "Come, come! Enjoy!" And that goes back to humans, because a lot of times humans won't know why there's so many fish there, but local fishermen take advantage of that as well.

Alie: Oh, that's interesting, that you'll kind of know, "There's something sunk around here, which means there's got to be critters."

Chanelle: And that's sometimes how we find out that there's a shipwreck. If you talk to local fishermen and you're like, "So, where do you fish?" And they're like, "Yeah, over here, there's always something hanging out." Yeah, okay, wreck. If you know the topography there is supposed to be 200 meters deep, there's got to be something attracting all those fish. It's a wreck, probably.

Alie: Oh my gosh. That's so fascinating.

Aside: So the shipwrecks bring all the sharks to the yard.

Now, what about the Bermuda Triangle? I feel like it's not fair to Bermuda to be mostly associated with all this drama, and Patrons Monica, Elizabeth, Tyler Duggan, RJ Doidge, Earl of Greymalkin, Ethan Bottone, Starr, Kinsey Wheatley, Nicole Kuha, Shelise du Cille Gagne (happy anniversary to you and Marcy; you kids grow up so fast!) first-time question-askers Stacy Graves, Courtney Andrews, Madi Reeves, and Hannah Lee all want to know, in Hannah's words: What do you think about the Bermuda Triangle and all the ships that have disappeared there? Is it a magnetic force, or is it aliens? Lol

Alie: A bunch of people want to know what's up with the Bermuda Triangle. Is it really dangerous?

Chanelle: I don't know. I have theories. Bermuda, you know... I want to say that most of the people that got lost there probably didn't know their way around and were relying on equipment that was not built for the area, versus if you had, like, a local who knows how to navigate atolls, and you know, rocky changes in topography and everything else, they probably wouldn't get lost.

Aside: I like to entertain the idea of spookiness, so I read into it, and this terrifying theory that the area between Miami, Bermuda, and Puerto Rico is a wreck magnet originated from a 1951 paranormal magazine. But experts say: Nope. It's just a heavily trafficked shipping lane with sometimes crappy weather. It would be like saying a freeway interchange in a snowy city is haunted by space goblins. It's a fun way to live, but it's flimflam.

Alie: Bruce has a great question. They ask: Treasure. Is it finder's keepers?

Chanelle: No. [laughs] Absolutely not, and that is a great question. Ownership of the past... So, treasure, finders' keepers, absolutely not, because you really do have to ask, "Who owns the past?" A lot of shipwrecks from the 1600s onwards, depending on where they're coming from, we have really good records of who actually owned those ships. If we can determine what the wreck is, we go back to the insurance company. Whoever put up the money to support that journey technically owns it. If they don't, then more than likely it's the property of the crown, like whoever's nation it was that sent it out. If not them, then it's the nation whose territory it falls within. If not them, then the nation of whoever's goods were on board.

Alie: Oh, wow.

Chanelle: So that becomes... Like, when you've got these Spanish doubloon cases found off the coast of Florida...

Aside: A doubloon, sidenote, is a Spanish coin, like what you might picture a treasure chest just filled with. They're shiny. They're typically around seven grams of gold and ornately stamped, and they can be worth thousands of dollars each. And it's speculated that the Treasure Coast of Florida is hiding \$400 million of these doubloons. And I just realized that if someone made a video game that was just called "Florida," it would rip in every way. So much excitement! But yes, who owns this booty?

Chanelle: That becomes this huge international thing because the US wants title to it, and Spain wants title to it. So yeah, a lot of people in line to get any potentially sunk treasure before the divers that stumble across it.

Alie: I imagine there's got to be people who are like, [sidemouth talking] "Let's... not tell anyone about this."

Chanelle: Yeah, sadly. And I sort of hate social media for this because I see it a lot.

Alie: REALLY?? Who's posting about it?

Chanelle: Oh my gosh, and I try to be good about it. I try to be educational and not snobbish. So, this is one thing I will say: If you are diving, if you want to be a wreck diver, something that they will not teach you in the courses but which is *your* responsibility, in my opinion, is to know the laws around the areas where you're going.

Most wreck divers are super awesome, and they're very interested in history. I hate that there's this subset of wreck divers who are so desensitized to it that they don't even think of wrecks as a piece of history. And that could be because a lot of times you train on scuttled wrecks, purposely placed wrecks that you know are safe. So then they go to WWII wrecks in fantastic places in, like, Hawaii and whatnot, and they don't realize, like, that's a war grave. Even though the US doesn't have the same laws as Britain, that's still someone's resting site!

I've seen even, like, random fountain pen groups where somebody picked up a fountain pen off of a WWII wreck site, and they're like, "My two passions combined!" I'm like, "Leave it, please! Take pictures, but leave it!" And they're like, "Oh, I kept it."

That's the big thing, too... Um, super nerd, here. Fountain pens have a lot of different materials incorporated into them, lots of different types of metals, plastics. All of those components need specific conditions for conservation, so you can't just put the whole thing in sterile water and just let it do its thing. Each of those needs to be treated separately. So, taking it out of that environment and putting it, like, on your office desk?

It's going to fall apart pretty soon, so you're not helping anybody by taking it. It's tempting for sure, I know, because everybody sees something and is like, "Oh, this is so cool. I want a souvenir," but it's like, please just take pictures.

Alie: Not to mention, no one needs an extra ghost. You know what I mean?

Chanelle: Yeah, absolutely not.

Alie: I don't need a sailor ghost being like, "Why'd you take my pen? Why didn't you leave my pen?" I don't need a curse.

Chanelle: I mean... I think sometimes that'd be super awesome because I would love somebody to chat with. I'd love to hear all their stories. But absolutely not, don't need a curse.

Alie: Don't need it! 2020 was enough. I'm good.

Stacy Graves, first-time question-asker, wants to know if there's anything unique about shipwrecks in the Great Lakes versus ones in the ocean. They're from Michigan, and she says she knows there are a ton of shipwrecks here. She said she's also heard about a Michigan Triangle. What's up with the Great Lakes?

Chanelle: Great Lakes, represent! I'm from southern Ontario, so Great Lakes is my closest big body of water. So, the big thing is that it is pretty much its own sea. People that are not from the Great Lakes region hear about the Great Lakes and how many shipwrecks there are there, and they're like, "What the heck, dude? It's like a pond." And I'm like, "No..." You can get massive swells; you can get horrible weather conditions. It's cold. I've dove on the east coast of Canada and I've dove in the Great Lakes, and the Great Lakes can be colder at times because it's fresh water and thermodynamics is a thing.

Aside: Fun fact: Fresh water freezes at 32°F but seawater freezes at about 28.4° because of the salt in it. Also, because of the westerly wind in the Great Lakes and the displacement of lower, colder water at the bottom of the lake, the west coasts of the Great Lakes tend to be colder than the east coasts, so you're not imagining it. And yes, as we learned from the wreck of the *Edmund Fitzgerald*, those Great Lake waters are not smooth sailing. They can have swells up to 40 feet high.

Chanelle: It's rough conditions. It's a great place to learn to sail if you want to be a good sailor, versus sailing in Greece where it's sunny and wonderful weather. I don't know about a Michigan Triangle, but there's absolutely tons of shipwrecks there.

Another really cool thing about Great Lakes exploration and why there are so many shipwrecks there is because a lot of those shipwrecks are from a period of transition. We were switching from sail to steam. We didn't just go straight to metal ships. We put steam engines... like, we retrofitted sailboats with engines, and boiler furnaces, and everything else. So when these shipwrecks sink, they're so heavy that they sink very quickly, and this improves their preservation, so that's part of why we see them longer and we think there's so many more. It is a smaller area so the density of shipwrecks is smaller compared to, like, all the seas and oceans of the world.

Alie: It didn't even occur to me until, probably, ten years ago that there were shipwrecks in the Great Lakes. Like, I only considered them in the sea, which is absolutely bananas. And then realizing that there were a lot of them... I think I came across one of those pictures, "In clear water, you can see this sunken wreck," and it's like, "[gasp!] Why is that so fascinating!"

Chanelle: Yeah, and then on top of that, shipworms can't survive there, so any wood shipwrecks that we do have a super well preserved, because it is cold, it doesn't have the same sort of currents, and even metal shipwrecks can survive very well in the Great Lakes because it's not salty. Salt is worse for metal because it helps it corrode more quickly, so it's really good preservation conditions. So it's just like, shipwreck on top of shipwreck, and we just hear so many tales about it. So it seems like there's a heck of a lot, and there are. But yes, a very cool area.

Alie: Ooh! Olivia Meyer, first-time question-asker, goes by Liv, asked: What does a typical day look like, and just in general, for a maritime archaeologist? Do you have any advice for people who want to get into this field?

Chanelle: Okay, so you do not need to dive to be a maritime archaeologist. If you do dive, and you want to be involved, and even if you don't but you want to learn about it, a great organization to look up is the Nautical Archaeology Society. It's based out of Portsmouth in England, but they run programs and they have, sort of, I guess, offices all over the world. And they have a tiered education system, so you can do, like... The level one, it's literally called Level One, Level Two, and Level Three. Their premise is to teach recreational divers how to be helpful to archaeologists. So, A) how to be good divers around archaeology, and how to be potentially useful to be able to volunteer. It teaches you the basic excavation and mapping skills.

The other thing I would say to divers who want to dive near shipwrecks of any sort, if you don't want an archaeologist to hate you, basically, have good buoyancy control, and have... There's something called 'trim' in archaeology, so you basically want to be very streamlined. You don't want to have your arms hanging out from you, dragging on the floor; you don't want your fins to be dragging on the seafloor. You typically want to be two or three feet above whatever you're looking at, and you don't want something to be hanging two feet off and just, like, bashing into everything.

Aside: So what is a typical day like for a maritime archaeologist?

Chanelle: It can be spending a day in the archives looking at records from the 1500s of what ships went into quarantine when, and who contracted the plague and whatnot. It can be a lot of grunt work, it can be a lot of carrying around tanks, a lot of sitting at a computer, definitely. But yeah, every day can be different, which is fantastic, which is why I like it.

Alie: Meghan McLean had one other question: After getting scuba certified this year, they say, I wanted to donate money to an organization that helps people of color have access to the sport and I found Diving With a Purpose.

Chanelle: Yes! Love Diving With a Purpose.

Alie: ... whose goal is to provide education and training in submerged heritage preservation and conservation projects worldwide with a focus on the African diaspora. Do you know anything more about how shipwrecks are connecting marginalized folks to their heritage, Meghan asks? Are there any ways that recreational scuba divers can help with preservation and science? But it sounds like that organization...

Chanelle: Yeah, NAS is a great learning body, and then working with Diving With a Purpose or any other, sort of, other organizations is a great way. A lot of maritime... especially something that's close to shore, they'd be happy to – depending on the site, depending on how sensitive the site is; if it's a military grave, maybe not – they'd be happy to have volunteers. Just talk to people.

Diving With a Purpose is amazing. Another fantastic organization is Black Girls Dive, and that's a double whammy because Black people and people of color in primarily white places are stigmatized against these fields, and women have this added difficulty because it's a very physical field a lot of the time. The men that we might be around might say that we don't deserve, or shouldn't, or can't be in those realms. So fantastic double whammy of an organization.

Definitely, shipwrecks are a huge way to reconnect with our heritage. It is a great tool that we have because Indigenous cultures typically, around the world, have a fantastic oral history. Their knowledge of locations of potential wrecks, even those that aren't of their culture, is so much better than, sometimes, what our written records might be in certain areas, especially in colonial regions.

Indigenous cultures seem to have a lot less shipwrecks, and I'm going to chock this up to being smaller ships and also having better knowledge of the areas that they're navigating. So that says something about colonial practices in terms of knowledge of navigation and putting themselves where they don't necessarily belong.

I won't say anything more about Indigenous populations because I don't know it and it's not my place. But absolutely, I think a lot of people who... I have somehow ended up working primarily with World War items and onwards, and there's so many people that lost their lives on them that, you know, their grandkids never met them, for example, and being able to work with those groups and reconnect them to a final resting place, or just... Can you imagine never being able to have seen your parents' grave? It's something. So that is super meaningful.

In particular about minorities, I would say watch the *Enslaved* docuseries. It's touching, it will make you cry, and that is very much about the black diaspora and looking at the slave ships that didn't make it to shore.

Aside: [*clip from Enslaved, Samuel L. Jackson narrates:*]

More than 12 million Africans were enslaved and trafficked. More than 2 million of our ancestors died at sea. The ocean holds stories that haven't been told.

So, definitely watch that film instead of an *Ancient Aliens* episode about, like, the lost mythical city of Atlantis.

Chanelle: I'm honestly impressed there hasn't been an Atlantis question yet, because that's normally my biggest rant.

Alie: Wait, hold on. Let me see if I missed it. Let me see... Okay, three people asked about Atlantis.

Chanelle: Okay, thank you. You have restored some faith in humanity that it's not on everybody's mind.

Alie: Ashley E wants to know: What's the deal with Doggerland? Is it the real Atlantis? Sara Hunt says: How realistic are the science, and history, and engineering shipwrecks of the animated *Atlantis* film? And Bella Trezza, first-time question-asker: Do you entertain theories of the Bermuda Triangle, or Atlantis, or other fun nautical conspiracies?

So yeah. Atlantis. Let's talk about it.

Chanelle: Um, I hate it.

Alie: [*laughs*] Hate it!

Chanelle: I love the animated movie. I have to admit I have not seen it in, like, 15 years, and I really should. So I can't say how accurate any of the engineering is, but if I remember correctly it was, like, super sci-fi, super steampunk, so I don't feel like it's super accurate.

[clip from Atlantis:]

Milo Thatch: We've all heard of a legend of Atlantis. Pure fantasy! Well, that is where you... would be wrong.

Mr. Harcourt: That young Thatch gets crazier every year!

Milo Thatch: I can prove Atlantis exists! I'm sure of it this time!

But yeah, Atlantis is probably my biggest pet peeve as a young person that's on social media. This isn't a thing that only I get, but you know when people slide into your DMs-type thing? They see 'Maritime Archaeologist' and they go, "So tell me about Atlantis," and they think that's going to intrigue me. I'm like, "No." Or they ask me if I'm just a treasure hunter. I'm like, "No. Block"

Alie: Aw geez.

Chanelle: Yeah, Atlantis probably doesn't exist. And people like to say, like, "Oh, but every myth has some truth." So I have to stress: Atlantis, there's no actual record of Atlantis existing, and it was from a Plato fable; something that he openly admitted was, like, fiction. It's not a recount of some lore. His fables were very well known to be fiction. They were supposed to be narratives that people could learn from. So the whole theory was that this Poseidon-worshipping city angered Poseidon somehow and was dashed... destroyed and sent into the abyss.

There's no mention in Plato's story of people actually living underwater. It's just not there. So to me, people still get fascinated about these big topics like Atlantis and *Titanic*, and it's painful to me that there's so much money going into it. Just go to Discovery Channel or History Channel and look at how many "Finding Atlantis!" "Atlantis Resurfaced!" so many... Like, how many times can we find this place? And I'm like, "Just invest that money somewhere else."

There's Indigenous cultures, there's vanishing seaside communities, there's traditional boat-building techniques that one person in an entire country still practices. *That's* where we can invest that money. It's so damaging to other cultures to be fixated on these super charismatic, possibly fake, or overstudied sites.

I'm sorry to anybody whose dreams are dashed.

Alie: No, I think it's good. I think this is necessary flimflam that needed debunked. *[sigh of relief]*

Chanelle: Yes. Please stop sending me messages about it, random people I don't know.

Alie: Okay, so if that is one of the most difficult things about your job, what's another thing that is difficult, or petty... anything. Anything that sucks?

Chanelle: The smells. Can I say that? People are going to hear this and think, "Wow, what a girl." But no, it's such a pungent profession. *[laughs]* Sometimes it's wonderful, like old books smell amazing. But okay, I've been on research vessels with guys, like, predominately male crews who are just working for eight hours a day... I was on a site that was over

100 meters deep, and the guys were excavating, and then they were coming back up. So, they dive in these dry suits, so you're sweating inside of it. It's quite warm.

And in a wetsuit, you know, your water flushes you out. And in a dry suit, it doesn't do that. So your sweat musk just lingers. Then you open up the suit and it's like, "Whooh. Wow..." And the thermal stuff that you wear underneath takes ages to dry. So if you're diving every day you're not washing your thermals until you're done diving.

One site I was on was, like, really close to a landfill. So if you surfaced and you've just been breathing out of a bottle for four hours, and now you surface and the wind hits you just right, you're like, "Yum..."

Alie: Oh, yikes!

Chanelle: Probably the worst. This deep wreck where I was working with the people that were diving in dry suits. I was working on the material that was surfaced from the year before. Because it's so deep, you don't excavate the way that you would on land. You don't look for artifacts as you go. They basically were just shoving everything in the hose, vacuuming it into this ginormous vacuum bag that holds, like, tons of sand. And then on land, we sift it out later.

And because we don't know how small the stuff we were going to find is... I actually found this tiny little piece of wood, which was the first piece of wood we'd found on that shipwreck – super exciting. Because we found this pretty small piece of wood, they're like, "Okay, start looking for, like, olive pits, or grape seeds, and all this other stuff." So we're, like, literally taking sand between our hands and rubbing it to make sure we don't miss anything.

And I came across this sand-covered bundle of slime. I have no clue what it was. I would guess, like, anaerobically decomposed because of the smell. My supervisor's like, "Just smush it. You can't just throw it aside. You need to make sure there's nothing in there." Because it was this, like, heft of some sort of slime. And it smelled so bad!! I washed my hands so many times and it still smelled bad. I went home and covered my hands in toothpaste and they still smelled. That's probably the worst.

Alie: Oh! What did it smell like?

Chanelle: I can't even... Like really, really, really bad sulfur farts, because there was methane. That's why I think it was anaerobic because I could definitely smell, like, the methaney, sulfury part. But plus an overtone of fishy, plus something that had been sitting out in the sun for months, because this had been in the sun for so long.

That's the thing. It was in this big pile of sand, in the sun, for like months, and it hadn't dried out. There was no, like, skeleton. There were no scales. It wasn't a dead fish. It was just slime. So, I have no clue what it was. I don't know, a dead squid maybe? I don't know.

Alie: Maybe. Sea snot. It was just a ball of free-floating ocean mucus.

Chanelle: There's no hagfish there, so... I don't know. It was so gross.

Alie: So what is your favorite thing about maritime archaeology?

Chanelle: Two things, I guess. Because I definitely love being around the sea, even just getting to look at videos of marine life. I pretty much am doing my dream that I had as a kid. That is the best thing ever. But then the other thing is getting to work with communities and

giving back to them, because I did get to sit with someone while they saw the shipwreck that their grandfather had died on, which was a submarine wreck, like, for the first time of it being seen in 75 years. That is amazing.

And getting to do Skype a Scientist, getting to actually make something accessible to people where most people aren't divers. Most people can't travel to fancy locations and dive on history, and actually work on a project to make sites accessible to people who don't have the typical abilities to see it. So, like, the visually impaired is my primary focus.

Everybody's response is like, "Okay, we've got 3D models." Then it's like, "Okay, covid. We can't go to museums. We can't hold these 3D models." So everybody's putting things online. But if you can't see these shipwreck images, that doesn't help you. So, getting to work with those communities and fill in those gaps is probably the best.

Alie: I think that's so amazing. I just... I know that you have a very long career ahead of you.

Chanelle: Fingers crossed.

So ask maritime scholars doofy questions, because chances are, they dedicated their life to this stuff because they actually like talking about it, so you have nothing to lose.

Also, follow Chanelle Zaphiropoulos [@SharksandWrecks](#) on Twitter. She's also [@SharksandWrecks](#) on Instagram. [Her website](#) is linked in the show notes too, and she sells beautiful postcards of her photography there. I'm just going to plug it because she didn't and I think her photography is beautiful. There's links to all those in the show notes.

We are @Ologies on [Twitter](#) and [Instagram](#). I'm [@AlieWard](#) on [both](#). If you want to join our Patreon, it's [Patreon.com/Ologies](#). Thank you, Erin Talbert, for managing the [Ologies Podcast Facebook Group](#). Shannon Feltus and Boni Dutch handle [merch](#). Emily White of The Wordary does transcripts. Caleb Patton bleeps them to make them kid-safe. Those are up at a link in the show notes as well. Susan Hale has been making those awesome quizzes you're seeing on Instagram. Noel Dilworth helps with scheduling my whole life and more. Jarrett Sleeper is handsome and also assistant edits alongside the myth, and the legend, Steven Ray Morris. Nick Thorburn wrote and performed the theme music.

And if you stick around 'til the end of the episode, you know I tell you a secret. And this week's secret is that I have started to do science consultation on a new kid's show for HBO. And I was on a Zoom that was pretty intense, discussing curriculum for children and the intersection of entertainment and learning. And the people on the call were psychologists who worked on *Sesame Street* and all kinds of shows. And I was in my office that I share with my fiancé Jarrett, and Jarrett farted so loud, like a cartoon, or like a whoopie cushion that was a human being.

And I don't know if my facial expression gave away that that was my audio, but he was off camera, so there's a good chance they didn't even know it *wasn't* me. And 15 minutes later I got off the call. I laughed *sooo* hard, and Jarrett said that he "just didn't know what was gonna happen." And the most shocking thing about it is that it took over a year to have a truly mortifying Zoom moment. But I think it was worth it. I'm sure we've all had them at some point, right? You're not alone!

Okay, smooth sailin'. Happy travels. Get the vaccine if you can. We are not out of this storm yet. Chin up. Masks on. We got this.

Berbye.

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