

# **Penguinology with Dr. Tom Hart**

## **Ologies Podcast**

### **April 21, 2020**

Oh hey, it's your internet dad who *just* learned how to mute her mic on Zoom, Alie Ward, back with a shiny new episode of *Ologies*. This one's coming out on April 21. Do you know what week it is? Y'all, it is world penguin week. [*whispers*] That's not true. April 25th is World Penguin Day. There's no such thing as Penguin Week, but I'm declaring it a week: World Penguin Week, welcome to it.

But before we get to the fanfare and the fun facts, a few thanks to everyone on Patreon.com/Ologies for supporting the show, thank you to everyone tagging their merch photos #OlogiesMerch so we can repost them. Thank you to everyone who has rated and subscribed on Apple Podcast and all the other platforms, especially to those leaving reviews to buoy the bad days, such as Saylor Thot, who says:

*Weirdly meditative listening. I've been listening to Ologies for quite some time but quarantine has made me appreciate this beautiful podcast more than ever. I listen to old episodes every single night to help me turn my anxiety off. Thank you dad Ward.*

You're welcome, Saylor Thot. Let's get to some penguins. Let's get 'em in your ears, and brains, and hearts. Penguinology - [*excited voice*] it's a real thing, it has been for years, we'll discuss shortly. I became aware of this ology after approximately 1 million of you tweeted a photo of this ologist, maybe a year and a half ago, with the chyron - which is the graphic at the lower third of the TV screen that says who someone is - and this ologist identified on the BBC as a penguinologist. Oh! And who better to call it that than one of the world's foremost penguin experts? He's legit! Penguinology is thus legit. So we have been in touch for months and months, but I had to wait for him to be in not Antarctica and then we hopped on the phone; he from the UK, where it was evening there and he was settling in to relax and get barraged with idiot questions from me, your stupid podcast host.

He is a research fellow at Oxford University's Zoological Department, he spent well over a decade working, and studying, and very gently spying on penguins. And heads up: PenguinWatch.org, where you can go and see wonderful penguins in remote regions on planet Earth. You can join 11,000 volunteers who help scientists, including him, count penguins by looking at pictures of penguins, and just putting a dot on the penguins. It's so good.

And quick audio note: if you hear any clickety clacking, that is just the keyboard in my shared home office with Jarrett, so just consider it like an ASMR treat. Okay? Great.

We talked about what it's like working on the ends of the Earth, how cold it is, what exactly *is* a penguin, how do they stay warm, and mating habits, weird knees, and bad parents, and neck facts, and diets, and swimming and waddling and poo, and you, and how you can help out our feathered friends. So observe this World Penguin Week by slipping on a tux and sliding down the ice to join us for one of the most anticipated episodes of *Ologies*, maybe ever, with penguinologist Dr. Tom Hart.

-----

**Alie Ward:** Okay. It looks like we're off sync, but I swear it'll work in the audio. We're in business! Dr. Tom Hart. You're a penguinologist.

**Tom Hart:** Yes.

**Alie:** This is so thrilling. I'm not sure if you understand how thrilling this is. You are perhaps the best person to ask about penguins, but also you're the best person to have on *Ologies* because you are a self-titled penguinologist.

**Tom:** Absolutely!

**Alie:** What was the moment that you decided that your lower third should say penguinologist?

**Tom:** I'm a bit unnerved by you calling it my lower third, that sounds... a bit invasive. *[Alie laughs]* But um, it was a BBC interview on emperor penguins, and I think I've been calling myself that for a few years. And it's half joke, but it's half... it's informative. It just tells people what you do. So the whole point is they usually laugh and then they ask, "Why? What?" And at that point you've got people. So it's the most honest ologist in that it's not everything I do - it could be anything from modeler molecular biology, to ecologist, or behaviorist - but largely, when I'm talking about penguins and particularly when I'm trying to conserve them, it makes sense to just say I'm a penguinologist. People know exactly what it is. And it is a little bit of a joke, but at the same time when people have, kind of, fought me on it I pushed back twice as hard because it is transparent and that's what we should be doing.

**Alie:** Do you have other academics who are penguin researchers telling you that that's not protocol?

**Tom:** I've had a few turn their noses up, but largely, no. I think people are coming around. I mean, it makes the point. And actually, through both outreach and engagement, I've been able to do a lot. So I think any early cynicism is fading now.

**Alie:** Mm-hmm. I mean, you're here with us now and would you have been...

**Tom:** That is the pinnacle. That's the absolute pinnacle of my career.

**Aside:** Dr. Tom Hart is a globally celebrated expert on seabirds, having been an author on papers such as, "High-coverage genomes to elucidate the evolution of penguins" and, "Divergent trophic responses of sympatric penguin species to historic anthropogenic exploitation and recent climate change." But those things, let's be honest, pale when compared to watching me fumble through my abject penguin ignorance over Skype, I'm sure. Where did it all start?

**Alie:** When did you start liking birds and zoology and conservation?

**Tom:** Very early on. I think any time from about age 10, I probably wanted to be a marine biologist. I definitely liked biology and I liked the marine environment and so it was that or lifeboat crew or something like that. But yeah, it's no surprise to 10-year-old me, who's pretty chuffed with it. It's no surprise. And yet at the same time it could have been a lot of other things that make a difference and are conservation related.

**Alie:** Did you always want to go on remote expeditions as part of your work or did it just so happen that penguins was an area that you gravitated toward or that needed you working on it?

**Tom:** I think I definitely wanted to go remote, but again, the exact ending up in Antarctica is a mild surprise because you're not told as a kid it's possible. I mean, you're told the standard jobs and no one ever mentioned this. And actually, really, almost any job in science, or lots of them, if you're doing it right you're inventing a new job that didn't exist for the previous generation because you're trying to push boundaries. So to some degree that's fair, but at the same time, yeah, no one told me that as a kid that I should be looking to work in Antarctica, or even that it was possible.

**Alie:** How many times have you been to Antarctica for your work?

**Tom:** I haven't a clue.

**Alie:** [laughs] Okay, so, that many.

**Tom:** Genuinely don't know, but I think it's something like 13 seasons worth over about 15 years. So I've missed a couple of seasons since I started.

**Alie:** What was it like the first time you went?

**Tom:** Genuinely life-changing. It's life-changing in the sense that it's like seeing wonders of the world, knowing that it's changing. It's very eye-opening to put things in global context as well as being personally very rewarding. So yes, it's definitely... I mean, I think, awe-inspiring, awesome, they're overused. But life-changing in the sense that you know there and then your life is not going to be the same; Absolutely.

**Aside:** A few of the places he 'commutes' to for work are the Sandwich Islands and South Georgia, which are little tiny specks no bigger than 100 miles long, way off the coast of Argentina. Just above the continent of Antarctica. Now, Antarctica, the continent: who even owns it? I asked Google for us. Well, it was, "discovered" only about 100 years ago, and doesn't really belong to anyone. It's likened to a condominium, politically, with different countries having jurisdiction and putting research stations there.

There was a 1959 Antarctic Treaty that essentially said, hey: nobody owns this, okay? Parts of Antarctica: how cold can they get?  $-89^{\circ}\text{C}$  (that's  $-128^{\circ}\text{F}$ ) and it's a polar desert: it's blustery, it's cold, it's white, it's icy, it's pristine, it's *gorgeous*. In terms of critters, you got your orcas, you got some seals, some albatross, you got some shrimpy little krill munchies in the water, and of course, penguins. Now, for Tom; why penguins?

**Tom:** It wasn't really penguins. It was studying the Southern Ocean and trying to conserve it. So if anything, I was attracted to the Antarctic Treaty and the idea that no one owned an Antarctica and that if you could show what the problem was, they had to fix it. That's a little bit naive with the politics of it, but it's still somewhat true. It's a place where knowledge can make a real difference.

I'd kind of distinguish between Antarctica and the Southern Ocean. A lot of Antarctica is different from the stereotype of just cold, white, and windy. I mean that's definitely true, but

it's incredibly diverse. No one goes to Antarctica knowing what it's like because although you've seen it on the telly, it's vastly different from that. And so everyone goes to Antarctica with some kind of story about how they got there. But at the same time, no one knows what it's like until they're there.

**Aside:** What is it like going to study penguins? Does a guy with a pipe and a wiry beard drop you off of a research vessel, like "Later, suckers! See you in 3 months!"? In a word: no.

**Tom:** It would be a bad season for us if we ended up in the same place for three months. We want to hit as many sites as possible and that's how we change data and knowledge about Antarctica is by going to a lot of different sites for very little and leaving things like time-lapse cameras in there, in place for a whole year, that record a whole year with us only there maybe for three hours. Now, we do still go places and camp, but largely we're getting dropped off somewhere for a few hours or a couple of days and then we've moved on.

**Alie:** Ah! It's like a very adventurous science cruise, "See ya in a couple hours!"

**Tom:** Well, I mean, we hitchhike on tour ships all the time.

**Alie:** Do you really?

**Tom:** Yeah, that's how we do a lot of our work. I mean, it's no joke. It's the most efficient way we can work. A tour ship will drop you off, usually near penguins because they want people to see them, for a few hours, and then while they're maneuvering somewhere else, you're having lunch, then you sleep, you know, you wake up and do it again. It's an incredibly efficient way to get around an enormous number of penguin colonies. [*"Can I have a ride?"*] Hitchhiking is how we've been able to do so much. So we've got a major benefactor called Quark Expeditions. They're incredible with us. But equally, you know, we have phoned people up out of the blue saying, "I gather you're going somewhere interesting. Hello, I'm Tom."

**Aside:** Hart. DOCTOR Tom Hart. Penguinologist. [*Mission Impossible theme music*]

**Tom:** And usually they give us a space.

**Alie:** When you're talking about these colonies, how many penguins are we talking and what species? Tell me about these penguins. As someone who has never seen a penguin outside of the zoo...

**Tom:** Why not?

**Alie:** Why have I not? That's a great question. I live in LA. Not a lot of penguins here.

**Aside:** Other than zoo penguins, which Tom says just aren't the same.

**Tom:** No, wild penguins are impressive because of the numbers in a colony and seeing them in a natural habitat is totally different. So, fix that please.

**Alie:** Okay, I will. I'll hitchhike now that I know some ground rules. What is a colony like? How many will coalesce together? How many?

**Tom:** It entirely depends on the species and where you are. In Antarctica, on the mainland continent of Antarctica, the colonies are actually often quite a lot smaller. So gentoo penguins, Adélies, they're often in colonies of about 3,000-5,000 with a few exceptions. When you get into the Ross Sea they can be a lot bigger; they might be several hundred thousand. Emperor penguins on sea ice, they're very varied. But yeah, it could be anything from a couple of thousand to, again, 100,000.

**Aside:** So a colony could be as populous as the city of Boulder, Colorado. Or even Vacaville. Or West Covina. Hi, West Covina!

**Tom:** The largest colonies on earth are in the South Sandwich Islands, and those are... We haven't finished counting them recently, but there *were* 1.3 million pairs. And that's a lot of penguins.

**Alie:** And are you using drones and mathematical calculations to figure out how many are in these huge colonies?

**Tom:** Yeah, everything we do is a mixture of... I mean, we're always trying to push the tech to get something. We're basically always playing catch up. These colonies are too big, they're understudied, and we want the answer fast enough to do something about, usually, declines. So the big thing is time lapse cameras. So that records, you know, a year in the life of a colony and as many images as we can get, we want to process.

So if we can take a photo every hour, we get the timing of breeding, and success, and things like that. If we can take a photo every minute during breeding season, then we get feeding behavior, foraging and all of that stuff, which has not been possible on the scale we're talking about of hundreds of colonies simultaneously. So yeah, we need a mixture of citizen science and machine learning. We need all the kind of AI tools and crowdsourcing if we're ever going to do this. But yeah, we're always pushing. Things like drones. With collaborators, it's satellite imagery.

**Aside:** Let's back up a minute. Let's just waddle on backwards.

**Alie:** And now, basic, stupid questions about penguins: What exactly makes a bird a penguin?

**Tom:** Well, common ancestry. I mean, they're monophyletic, which means they evolved once and then everything else is diversified within them.

**Alie:** Oh!

**Aside:** It's thought that penguins diverged from the ancestors of albatrosses and petrels 71 million years ago! "What is a petrel?" you're asking. That's a good question. I didn't know. It's a tube-nosed, short-winged seabird. And if you squint at a picture of a petrel, you can kind of see the resemblance to a penguin. It's kind of like looking at two brothers with wildly different haircuts, and one of them can fly. But penguins, you are great swimmers. This is not a contest.

**Tom:** What makes them a penguin in terms of... if you're going to describe them, it's quite a large seabird. Seabirds tend to be larger on average than other birds, but penguins are large. They

don't have hollow bones, so by giving up the ability to fly, they've become a lot better adapted at diving and swimming.

That's also allowed their feathers to change. So, those are more about hydrodynamics and insulation, obviously. There's a lot of cold adaptations, both anatomically and behaviorally as well. But one of the big things that people forget is starvation tolerance. I mean, you think of the Emperor penguins, the males that are incubating an egg and then a chick for about three or four months. That's a lot of it. Any other species, they molt all at the same time. Flying birds, they molt several feathers at a time so that they can still fly.

**Aside:** So, a few weeks ago, in case you missed this - we covered it in Plumology - flying birds will lose a flight feather from one side and then the other, that way they can keep balance. And some species, like parrots and pelicans, it can take them up to two years to replace all those ding dang feathers. But not penguins. Penguins are your friends who cannonball into a pool instead of dipping a toe in. They are ride or die, all at once. Let's do this.

**Tom:** Penguins all have this catastrophic molt where they then go to sea for a week or so, feed up as much as they can, and then they stand in one place, looking grumpy, losing all of their feathers before the winter.

**Alie:** Ooooh!! What is the evolutionary advantage of doing it all at once?

**Tom:** I'm not sure, but I think it's so they don't lose foraging efficiency when they're breeding. And then, because they can't do it over winter, they want to go into winter with peak condition for their feathers.

**Alie:** And what are some behaviors in penguins that are so different? What are some of the behaviors that are so endearing about penguins or that are shitty and make them bad, bad people? *[laughs]*

**Tom:** I mean, do we have to call it endearing? I think they're awesome.

**Alie:** No, we don't!

**Tom:** They deserve our respect.

**Alie:** Okay. *["Don't condescend me, man!"]*

**Tom:** The one a lot of people think of is huddling in Emperors. But that really is almost only in Emperors for the breeding. King penguins that look very similar but are in the Sub Antarctic, in places like South Georgia, they also huddle over winter, but only the chicks. So, the chicks get left behind and you see these massive aggregations of chicks huddling to keep warm. So, mostly it's a thing that's found in chicks rather than the adults. And it's a mixture of trying to avoid big predators pecking at you as well as to stay warm.

**Aside:** Come on! A bunch of fuzzy ground birds in tuxedos having an icy cuddle party? Let me have this.

Also, a quick who's who of penguins. Are you ready for this? There are 17 to 20 different species, and my understanding is that there are more than 20 Penguinologists who disagree

about subspecies. But either way, on the shores of Antarctica we have Emperor penguins. These are the big guys: 3 to 4 feet tall. They have this sheen of golden yellow on their face and chest.

And then there are smaller Adélie penguins which have very simple curved lines. They're black and white. Adélie penguins look like mid-century modern of penguin design. Very simple. So elegant.

King penguins look like smaller Emperor penguins and they're in the northern reaches of Antarctica and the Falkland Islands.

Chinstrap penguins, they look like they're sporting a little black bike helmet. They live on islands in the Scotia Sea.

Gentoos are on the Antarctic Peninsula and the nearby islands, and they're the ones with the orange feet and the matching orange bill. Gentoos are like those ladies with nice shoes and handbags that go together.

Crested penguins: those are the ones with the bananas yellowish spikey things near their eyes. They have a very speak-to-the-manager haircut and they include Rockhoppers and Macaroni penguins, named not for the pasta but for the flamboyant men's fashion style of macaronism of the 1700s. So fabulous.

There are Banded penguins which have kind of a racing stripe around their bellies. Those are in South America and South Africa. They include the Jackass.

There are Yellow-eyed penguins in New Zealand and the Sub Antarctic Islands.

And finally - *finally!* - Little penguins! Those are on the Southern Australia coast and New Zealand and they have a bluish tint to their feathers and they're teeny! Just over a foot tall! Maybe 3 apples high? And blue? Motion to call them Smurf penguins? [*"Overruled!"*]

Alright.

Also, 37 million years ago, there was a Colossus penguin which stood - [*whispery voice*] Oh, my god - 6 feet 8 inches tall. The same height as LeBron James. So, if you take nothing else from *Ologies* as a podcast, just know that at one point on planet Earth, there were groups that looked like entire NBA basketball leagues consisting only of ginormous-ass penguins.

**Tom:** The movement around the colony is phenomenal. I mean, it really is a bit like a city in the respect that you've got loads of nests that are kind of really regularly spaced. And so, there's just penguins looking quite stoic, staying in one place, and then these massive highways of movement and partner exchanges so that... They can't leave the egg, so a lot of what you see minute to minute is penguins huddled over on a nest and then occasionally one relieving it and the next one going to sea. So, the behaviors you see are largely the kind of stoic ones, the ability to stay in one place and stay warm for a long time. And then, it's really visibly about the dedication to an egg and then a chick.

**Alie:** And how do they find their nests again? Do you guys know?

**Tom:** Um, no, but I think... if it's known, I don't know it. But it doesn't bother me. I mean, I think if I could roughly find... it's like in a crowd, you wouldn't say, "Oh, you're so clever that you can find a human in a crowd!" I mean, you'd go to where you last saw them, then you might call. [*I'm over here!*] It's not that hard. We are giving them undue credit in that it's... we could probably do that.

**Alie:** Do they have certain calls for each other?

**Tom:** Absolutely. Particularly between chicks and adults. And then, between the adults, between the partners, it's probably more tone. So, I'm sure they can recognize them by voice, but a lot of it, we think, is tone. So, it's like you come home, say to a partner, "How are you? How are you, dear?" Or someone says, "How was your day?" And you say, "Oh, fine." And they say, "Right, what's wrong?" [*Alie laughs*] So, tone is probably more important than what they're saying, because to us it seems like they're saying the same thing all the time.

**Aside:** These calls can vary wildly between species, but most that I heard (when I went down too deep a rabbit hole) sounded like lovelorn horny kazoos.

**Alie:** And, what about monogamy? I know people love to cite penguins as these pillars of monogamy, but no animal really is.

**Tom:** Definitely no bird. I mean they're pretty monogamous, to give them their due, and particularly if something works, they stick with it. If it doesn't work, or if the partner doesn't come back, they move on. Then, within a season there's also some extra-pair copulation.

**Aside:** Oh heeeeeeeey!

**Tom:** The estimates, I think, put it at roughly 10%. Penguins have been used as justification for a lot, by all on the political spectrum. And that's absolutely fair. We can infer good qualities from penguins if we also are prepared to poo where we sleep and eat more krill. Outside of that, I think we should leave them to be penguins.

**Alie:** [*laughs*] What about same-sex penguin couples? Does that only happen in captivity or is that in the wild as well?

**Tom:** I don't know if it's been conclusively shown in the wild, but I would expect it to happen. So, that's almost like giving humans too much credit, to say that we're the only ones that can do it. So no, I mean, I'm positive it's there. I'm not sure. It's an interesting research question.

**Aside:** Okay, I looked this up and there have been studies, like one published in the journal *Ethology* in 2010, which found that same-sex courtship displays were common. 28% of 53 displaying pairs in a study of King penguins. And then a fraction of those went on to learn each other's calls and bond as couples. 10/10 - would happily bake a cake for their nuptials. But Tom says there are more interesting questions to be had. What is he working on?

**Tom:** In the field, we generally get landed somewhere by a small rubber boat called a Zodiac, and we jump off, and we might be changing a camera and hoping it's working. They usually do, but you know, you're very tense trying to get the data down. Often, we fly a drone so that we can do all the counts and we can get spacings of penguins and things like that. And then



we're often sampling, which is picking up feathers and taking poo samples. [*"Oh, that's the good stuff."*]

So, the cameras are getting behavior. The drone will be looking at counts and also spatial structure of the colony. Then poo samples are everything. Biologists do love poo. It's a great record. So, that is everything from diseases, to diet, stress. We're doing more with that over time. I mean, at the moment we're looking at disease, but we also have plans on diets and stress.

**Aside:** For more on these topics, see the recent Scatology episode on poop or Plumology on feathers.

**Tom:** Oh, and then also feathers! We can often see what they've been eating over time.

**Alie:** Like we would use a hair in forensics?

**Tom:** Absolutely. I mean, it's grown at once. It's grown in one year, but over a period. That's Mike Polito's work, by the way, that I just took credit for, but I'm sure he won't mind. I picked up some of the feathers.

**Alie:** When it comes to populations for penguins - I'm afraid to ask - how are they doing?

**Tom:** Uh, largely, fairly poorly. [*"Dammit."*]

Some of them are doing well. Gentoo penguins and King penguins are doing pretty well and, largely, they're kind of the climate change winners. Also, King penguins, they were probably exploited in the past, so there's a kind of rebound from that. The ones that are within Antarctica or the Southern Ocean, the ones that are really dependent on krill and ice, are doing very poorly.

Adélies and Chinstraps are doing very poorly in the Scotia Arc. Adélies are actually doing pretty well over in East Antarctica, which is the bit south of Australia. They're doing pretty well there, where the sea ice is relatively stable. But, actually, you come outside of the Southern Ocean, come to South America, South Africa and actually, those temperate or subtemperate species, those are the ones that are doing really badly. I mean, they have crashed. And that is hard to say. But, it's likely a mixture of direct disturbance and fishing. And in some cases, it's actually guano extraction as well, where they took historic depositions of poo to use for fertilizer. And so, that's actually destroyed habitat where all the warmer weather burrowing penguins would burrow to have their nest.

**Aside:** [*deep voice*] Stealing poo, not cool. No turd thievery, please.

**Alie:** And so, it's more using it for industry rather than just sightseeing that is the disturbance?

**Tom:** Absolutely. Yeah. I mean, that's historic. Fishing is still very much going on, even in Antarctica. And tourism is an issue, but it's also sort of essential. I mean, we need people to keep an eye on other people down there. So, you actually need this kind of standoff of tourism versus national programs to actually enforce and to flag up pollution events and things like that. I mean, tourists largely are pretty well controlled, so I would say they have to be part of the solution.

**Alie:** So don't feel bad about going to visit a penguin colony?

**Tom:** No, no, if it's well run. I mean if they are telling you to stay 5-10 meters away. All of the tourism in Antarctica is pretty well regulated. I am not sure if that is true around the world where they are near human populations.

**Alie:** This is a stupid question. Do you have a favorite type of penguin?

**Tom:** No comment. *[laughs]*

**Alie:** No comment! Wow! that means yes.

**Tom:** Yes. The arsiest one. There is one species that is absolutely, um... Can I slag off New Yorkers or Londoners?

**Alie:** Yes, sure.

**Tom:** Okay, so am I gonna get hate mail?

**Alie:** Naaah.

**Aside:** Okay, were just gonna direct this towards Londoners because, New York, it has been a rough couple of months. We see you and we love you. And wow, this is going to take some needling to get Tom to shittalk a penguin species. Right?

**Tom:** Well, it's Macaroni penguins. So basically you look at the colony of macaroni penguins. They would steal your hubcaps. They're just wonderful. They're charismatic in their level of aggression that they show each other and it's a lot like... imagine if you sat at a table in some café in either London or New York, just watching all of this go down.

**Alie:** *[laughs]*

**Tom:** That's Macaroni's.

**Alie:** So they're scoundrels.

**Tom:** Yeah.

**Alie:** But admirably so. Okay, I'll take it. Yes! I can't believe I got that out of you! I'm so excited.

**Tom:** I can't believe I caved so easily.

**Alie:** *[laughs]* It's the wine. Can I ask you questions from listeners?

**Tom:** Yeah.

**Aside:** But before your questions, each week we donate to a cause of the ologist's choosing, and this week we did two! He had two picks and I was like, "Let's do it, man!"

One is Terrestrial Restoration Action Society of Seychelles, which plants mangroves and helps with deforestation along coastal regions, which also helps to offset carbon footprints associated with global travel. So, jetsetters, that's a good one. An excellent choice.

Another donation is going to Penguin Watch, which helps fund Dr. Hart's work alongside his collaborators around the world who've researched the threats to penguins and how to

mitigate these threats using long term monitoring in the field, and using genetic analysis of penguin feathers to get a complete picture of how populations are changing.

Donations went to both organizations. That was made possible by sponsors of the show which you may hear about now.

[Ad Break]

Links to those sponsors and the charities are in the show notes. Now, your questions.

**Alie:** Stupid questions from wonderful listeners. Zoe wants to know: Do penguins smell more fishy or more birdy?

**Tom:** Fishy, but they sort of sort of smell seabirdy.

**Aside:** Seabirdy?

**Tom:** It's a mixture of raw sewage mixed in with ammonium.

**Alie:** Okay. [laughs]

**Tom:** But, it's wonderful. After a while you just... Anosmia is a great thing. Your nose has a lot of nerves that talk to each other and after a while you just don't smell it.

**Alie:** Okay. And I imagine it probably imprints as comfort, as a, "Oh I'm back with the penguins."

**Tom:** Yeah.

**Alie:** Maybe. Okay.

**Tom:** Or occasionally if someone opens a bag in the lab, or a notebook, or something, it all comes back quite quick.

**Alie:** That olfactory nostalgia, I'm sure, is pretty hard core. [*"Mmm! Smells so good."*]

Elena Clemencon-Charles, first-time question-asker, wants to know: What does a penguin feel like? What is their texture? But also if you squeeze them *just a little bit* would they be squishy or really solid?

**Tom:** They would be really solid and they would hurt you back. They're feathery. They'd feel like a strong-muscled duck or... nothing like most of your pets. That's the key. They wouldn't feel soft and squishy like a dog or a cat. They are balls of muscle.

**Alie:** And also their bones are not hollow, so are they denser than your typical bird?

**Tom:** They are definitely heavier than any equivalent size, and also they use their flippers as weapons both on each other and on passing researchers. They will flipper whack you if you get too close.

**Alie:** Have you ever been slapped by a penguin?

**Tom:** Oh yeah.

**Alie:** Does it hurt?

**Tom:** Yeah.

**Alie:** Okay. Are their flippers also feathered? Right?

**Tom:** Yes, they're very small feathers. Those are wings, they are flying underwater. But the feathers on flippers are very small. It's almost like a shark skin, where they're trying to shed small vortices so they don't get a lot of drag. It's like a one-way sandpaper kind of thing.

**Alie:** Oooh, okay.

**Aside:** I looked up photos of penguin feathers. And yes, on the flippers, they're very little, and they overlap, kinda like roof tiles. And on the body, there is some serious fluff under the shiny surface. So, that's good to keep out chill, maybe serves as padding for body tobogganing? Perhaps?

**Alie:** Sabina Ciardi wants to know: Do penguins really slide on ice as you see in *Super Mario*?

[clip of penguin from *Super Mario*: honky-squawk]

**Tom:** I don't know what happens in *Super Mario*. I'm really sorry. But they do slide on the ice.

**Alie:** They do?!

**Tom:** Yeah.

**Alie:** Are they having fun?

**Tom:** No, it's usually if they need to get away fast, or if it's really downhill. They seem to prefer to walk unless it's really hard going because the snow is actually quite coarse, and it rubs all the oil off their feathers, so that means they've got to preen later and re-oil them.

**Aside:** I was like, "Where are they getting this oil? They probably barf it up from a krill pouch in their beautiful, weird necks." So I looked it up for us. And, thankfully, - whew! - it's just from a grease spigot near their butt. No biggy. It's at the base of their tail and it looks like a little fleshy knobber-jobber. It's called a uropygial gland. But you know what? If you're close pals, please, call it a preen gland.

**Tom:** I'm waiting for some really stupid question from a friend. I'm positive.

**Alie:** [laughs] Michelle Lee wants to know: Can penguins drink seawater? Is that how they stay hydrated?

**Tom:** Absolutely. Yep, they eat snow and drink sea water. And they have a gland just beneath their eyeball at the back of the bill. A lot like our kidneys, but actually functional for drinking seawater. They can shed saline quite well without it dehydrating them. So yes, they can definitely get water from seawater, but given a choice they would rather drink fresh or snow because you are not having to expend energy.

**Alie:** ...of getting rid of the salt.

**Aside:** Okay, this next one is about a penguin with a donkey call and thus: a very unfortunate name.

**Alie:** Toni Olivier, first-time question-asker, wants to know: The African penguins, previously known as Jackass penguins, are endangered and there's a project underway to try to create

a new colony to bridge the big distance between the two existing colonies. Has this ever been attempted or achieved before and is it likely to succeed?

**Tom:** I have no idea. But it's definitely been achieved before in puffins on, I think, Eastern Egg Rock Maine. There was a colony of puffins that were reintroduced by someone. A researcher made dummy puffin models and started broadcasting breeding calls because there were puffins around, but they weren't nesting, and managed to get them to resettle. And I gather that's now quite a successful colony.

**Alie:** I did not know that. Did you know that the porgs in *Star Wars* were puffins?

**Tom:** Yes. We actually have a camera there. We actually have a camera that was just out of shot in that, so if you go on Seabird Watch you can be a part of *Star Wars*.

**Aside:** I looked this up. And these scenes from *The Last Jedi* were filmed on Skellig Michael, an Irish island which is absolutely lousy with puffins. Just infested with these squat, colorfully beaked, just stomach-churningly pretty, Atlantic puffins. They are so repulsive you just want to [*cute-aggression grunting*] cuddle them! So yes, Disney and *The Last Jedi* director couldn't paint them out of the background so they made a new icon. And a bunch of cash on porg merch. It was easier than cheating them out of the scenes.

Speaking of cheating, many of you Patrons had questions about penguin monogamy, such as Julia, Ruby Johnstone, Emm, Flying Squid with Goggles, Catalina Ibarburu, Elisa Figueroa, Jess Lin, Zoe Jane, Natalie Bradt and first-time question-askers Silvia Triverio, Sam Cohen, Andrea Devlin, Julia Hayman and Emily Dix, plus two folks, Sid Gopujkar and Enrique I. C. Sarmiento who saw the same Nat Geo video titled *Homewrecking Penguin*.

[*clip from Homewrecking Penguin: "But this husband has come home to find his wife with another penguin."*]

**Alie:** They saw this video in which two penguins nearly beat each other to death because one's partner cheated on them with the other. Is that a common occurrence?

**Tom:** It's not common but I've definitely seen it.

**Alie:** Really?

**Tom:** Yeah, absolutely. I mean that's classic social punishment to deter them, but yeah that definitely happens.

**Alie:** Wow, that is draaamaaa! A lot of people had questions about, flight in wings and flippers.

**Aside:** They were Stephanie Broertjes, Emm, Anna Vallery, Mikayla Goings, Vanessa Frey, Kourtney Ryan, Corrie Navis and Ashlin who wrote: Do penguins have flippers? Or are they technically wings? Oh boy I'm so excited for this! And then there was a heart-eyed emoji.

**Alie:** Troy Clarkston as well as others want to know: Have penguins always been flightless birds or were they at one point able to fly and then they just got better and better at swimming?

**Tom:** So, flightlessness has evolved several times in seabirds. Actually, fun fact, the word penguin means great auk, which is now an extinct seabird in the Northern hemisphere. It means

white cap, whitehead. So, it's probably sailors that first came south and saw something that they thought was a great auk.

**Aside:** A great auk is a now-extinct, flightless bird whose numbers dwindled partly because its fluffy down plumage was prized in Europe. And now there are no more great auks. They stood nearly a meter tall. They were great. They had a grooved, black beak and they looked like a penguin, but they were not closely related.

**Tom:** Flightlessness has evolved in seabirds several times, in cormorants, in the Auks, and also in penguins. I think the nearest, modern relative is something like a pelican, and the ancestral penguin was quite big and gradually... you got better at, probably, diving and then gave up flight. I mean there are examples of bad fliers like... cormorants are a great one. Cormorants and shanks aren't good flyers, but they're quite good divers. For a penguin to evolve, you probably have to have no predators on land, and you probably have to be quite close to your food source so that you get better at diving and it matters less and less that you have to either be able to fly to escape predators or that you have to be good at flying to get there. Then you probably just get better and better at diving.

**Alie:** Any flimflam that you would want to debunk? Any myths about penguins that you are so sick of?

**Tom:** Uh, I'm really glad you defined flimflam. Uh, that they fall over when aircraft go overhead.

**Alie:** That does not happen?

**Tom:** No, there used to be... I don't know where it started, but yes, they don't fall over backwards and can't get up.

**Aside:** This flimflam, by the way, started as stories of Royal Airforce pilots swooping over the Falkland Islands and our penguin friends would stare up at them and crane their necks until they plopped backwards. So it was said. Now, this has been bird lore for so long that one penguinologist, Dr. Richard Stone, finally flew a bunch of aircraft over some King penguins in South Georgia at various altitudes for 5 weeks; and nary a penguin toppled. Not one! They did run away and they seemed irked, understandably. Like, "Can you not? Urgh, no. Enough."

**Alie:** What about movies with penguins? Do you have a favorite or any that are on your shit list?

**Tom:** Oh, yeah.

**Alie:** Really?

**Tom:** I want to say no comment, but I also really want to say it. So, Morgan Freeman is one of my favorite humans. And yet, *March of the Penguins* is wonderful with the sound off, and it's slightly exaggerated throughout. It's really disappointing when Morgan Freeman is exaggerating about penguins and I'm like, "Oh, Morgan." So, *March of the Penguins* is absolutely one of the best. But yeah, it's just... it's all kind of, you know, it's very dramatized. With the sound on, it would be *Happy Feet*. It gets the behaviors so well.

**Alie:** Really? So *Happy Feet* gets the behavior really well?

**Tom:** Yeah. Just every now and then when they're walking with attitude, it's stunning. I mean, it captures something. It's like seeing, you know... it's like someone doing an impression of someone famous or your best friend. It's a lot like that. So yeah, *Happy Feet* is really good.

**Aside:** So enjoy *March of the Penguins*, but know that it's kinda like David Attenborough with a dash of *Real Housewives*.

**Tom:** You absolutely don't need to exaggerate about penguins. They are badass and they are really stoic, and strong, and amazing. [clip from *The Office*: Michael Scott, "My respect!"]

**Alie:** A lot of people, Sarah Nichelle, Josh Duncan, Megan Johnson, Elena Clemencop-Charles, Madelyn Dunkle, Taylie Kawakami, Dianne P, all want to know: What's happening with pebbles? What makes one pebble better than another? How do penguins decide on the best pebbles to give their mates?

**Tom:** Um, lots is the simple answer.

**Aside:** Some species of penguins, like Gentoos for example, are like, "If you wanna bone, you better bring me a bunch of small rocks." It's like a rose ceremony, but with a bunch of small rocks.

**Tom:** So, how do they decide on it? If they can carry it. They tend to be of a certain size. Partly I think that's what's available, but they're definitely choosing. I mean, it can't be a stack of grain. It can't just fall down. They're for insulation, basically. It's to keep the eggs and the chicks out of meltwater when it starts getting a bit sloppy. So they're like a raised stone donut and the higher the better. It's not just giving them to their mate, because they both do it. They both maintain the nest, but the male is usually building... well the male is building it and then the female is usually helping. There's a lot of maintenance in between foraging trips. But yeah, pile them high. That's the secret. Pile them high and then keep your egg out of any meltwater.

**Alie:** Oh, so they're functional. They're not just like, "I thought you might like this."

**Tom:** It's a bit of both. It's good real estate - it's showing that you can provide. So that's more in the choice, and then it's maintaining a nest.

**Alie:** Some people had questions about necks and knees. Taiya McInnes wants to know: Why does a penguin's neck account for so much of its body? And Madison Nobrega. And Hadley literally just wrote: Penguin knees???

What's happening?

**Tom:** Well, penguins do have knees; they're just tucked inside their body. So, they look like a swan sat upright, basically, if you could take the flesh off - let's not do that...

**Aside:** If you can, picture a penguin: no neck, tiny stubby legs, right? Hah! That's what you think - that's what we all think! Their knees are way the hell up there. They're tucked up almost near their ribcage. Then their seemingly bodybuilder lack-of-a-neck is actually longboy! Their neck goes *all the way down* to where their flippers start (pretty much)!

Do they look like a fluffy potato? Yes, but they're like the Billie Eilish of birds - what's under there is none of our damn business!

**Tom:** I'm not sure why their necks are so long. I have no idea why they've maintained that, because it really is tucked inside the body most of the time. It's used in courtship, so anything that's kind of a sexual signal is often maintained. But in the water it's tucked right in and they look a lot more like a torpedo.

They still have a lot of dexterity in their feet and legs, both walking and also in the water as rudders.

**Alie:** Oh - as rudders! So that's kind of how they maneuver so fast. How deep can they dive?

**Tom:** The record is an Emperor penguin that's just over 500 meters. The smallest ones, Little penguins in Australia, might be 20-30 meters. Most of them Antarctica are diving where the prey is, so that's often anywhere in between 40 and 60 meters. Emperors, half a kilometer. That's pretty bonkers.

**Alie:** Wow! How do they not get the bends?

**Tom:** Most breath-holding means you don't have a build-up of nitrogen. Also most diving animals store a lot in their muscle and they have myoglobin that releases a bit more slowly.

I don't know about birds, but a lot of diving mammals do get decompression sickness over time.

**Alie:** Kyle Wilkinson wants to know: Are they black with white feathers or white with black feathers?

**Tom:** I think developmentally they are white with black feathers because you can occasionally see mutations where you see a line but the black is gray.

I'm not sure. But, it's amazing how many species are both black and white and that countershading ... That's one of the coolest things about penguins, is that in general everyone thinks of them as upright, and they're not. That is when they come ashore to breed, and if they could breed in water, they would.

When they're in water, that's their natural element, like cormorants, and so many sea birds, and also a lot of killer whales, and things like that - this countershading is camouflage. If you look at them in the water from above they're dark against a dark background, and if you look at them from underneath they're light against a light background. So, you just see black and white animals everywhere because that seems to be just a natural way to camouflage yourself in the ocean.

**Alie:** I never even thought about that!

**Aside:** Orcas and penguins: they're wearing the same fabulous outfit and just slaying! And getting slayed, but I don't want to think about that.

**Alie:** The most common question I got by far ... Megan Younce, Nicholas Couzelis, Megan Johnson, Nikki DeMarco, Kelli Brockington, Sarah Peck, Joey Tab, Amanda Lotz, Loretta Neal,



Elizabeth Kapustka, Diana Silver, and Jess Swann all have the same question, and it is [*long drumroll*]: Why are they so cute?

Why are 'penkins' so dang cute?

**Tom:** [*laughs*] Genuinely no comment.

**Alie:** [*laughs*] Do you find them cute? I know you work with them, but do you...

**Tom:** No.

**Alie:** No? You respect them more.

**Tom:** I don't find them cute. I find them absolutely awesome. [*slow-mo Alie: "Okay"*] No they're not cute, they're wonderful.

**Alie:** I love that distinction, that you would not patronize them to the point of calling them cute!

Are you aware, as one listener Julia Tolbert said: Is it true that the Chinese word for penguin translates to "business goose"?

**Tom:** [*laughs*] I have no idea!

**Alie:** Maybe that's why we think they're cute, because we see them in a tuxedo but really they're just, like, an Orca, counter-shaded for maximum bad-assery. Wow. We need to have a completely different view of penguins - they're not cute, they're badasses. They're a business goose!

**Tom:** Or maybe we should think of us when we have to be smart as more 'business goose.'

**Alie:** I think we should!

**Aside:** Okay y'all, I checked this out, and 'ding, ding, ding, ding, ding!' - it's real. Oh lord, oh my word! If there is nothing to be happy about and you're feeling glum, just remember: 'business goose' is a thing! To be fair, the Mandarin translation could also technically mean 'tip-toe goose' - that's also great! Either/or. 'Tip-toe/business goose'? All in. My life is changed!

Another thing that's real, and I didn't know what aside to put it in, was: some species of penguins try to steal each other's chicks if theirs dies. Penguin abduction - not very business-like!

**Alie:** The last questions I always ask: What do you hate the most about penguins or your work? There's gotta be something that sucks about being a Penguinologist.

**Tom:** Email. It's always email. I crave the destruction of email so I can get on with what is important. [*Alie laughs*]

And in science, short-term contracts. Otherwise, there is very little that is bad about my job. So it's a tiny bit of insecurity, and it's a lot about trying to do 12 months'-worth of admin and emails in eight months.

Otherwise, no - I literally have the best job in the world! It's incredible and there are a lot of times where you pinch yourself. It's nuts! What me and my team, collaborators - it's

absolutely insane what we get to do *and* in the knowledge that we're making a difference. That is crazy.

I wish someone had told me that as a kid because that is so important. I genuinely cannot believe... I still expect someone to tap me on the shoulder and say, "No you can't do that. The gig's up."

**Alie:** [*giggles*] What's your favorite thing about it?

**Tom:** The year-to-year is the ability to make a difference. Then the minute-to-minute, the highs are... some cases we've been to places that no one's *ever* been. A lot of places where very few people have been or seen what we do.

I just got back from the South Sandwich Islands, and we always have this argument... and the fact that you say "always have this argument in the South Sandwich Islands" is a little bit like saying, "I was on the moon the other day." No one gets it. But since we don't have Google, we were arguing, trying to calculate where the next nearest human was, and was it on the space station or was it on South Georgia?

So, there are some truly bonkers moments like that, and there's quite a few nutty moments where you pinch yourself and genuinely cannot believe you get to do this.

**Alie:** Is there anything that you feel like people can do for penguins? The Average Joe?

**Tom:** Absolutely! Eat less krill. Krill supplements are taken from Antarctica. It's actually hard to know the degree to which that's damaging Antarctica, but I do not think we should be exploiting Antarctica. Omega-3 supplements from krill, they're a placebo anyway. There was a meta-analysis recently that showed they had either no or they had a negative impact on humans.

So please don't eat krill. Eat less krill unless you're a penguin, in which case, eat more krill. Otherwise no. They can go to Penguin Watch, and every time they go to Penguin Watch and click on something they're helping us with data and protecting the penguins. That's pretty wonderful.

**Alie:** Thank you so much for doing this. You are the world's most famous Penguinologist!

**Tom:** [*laughs*]

-----

So ask smart penguins stupid questions because they deserve our respect. They are *not* cute - even though they are very adorable. So, to watch more penguins and to follow Dr. Tom Hart's work you can check out [Twitter.com/Penguin\\_Watch](https://twitter.com/Penguin_Watch); they're also [@penguin\\_watch](https://www.instagram.com/penguin_watch) on Instagram.

[PenguinWatch.org](https://PenguinWatch.org) will take you to the best video game ever! You can help scientists count 'business geese'! They're using community science to get their counts right! I did it last night and it was like *Animal Crossing*, but real animals. So there you go. You just get to look at pictures of penguins and clickity-clickity-click, and help 'em count. It's the best. A link to that will be in the show notes.

We are @Ologies on [Twitter](https://twitter.com/Ologies) and [Instagram](https://www.instagram.com/Ologies), I'm [@AlieWard](https://www.instagram.com/AlieWard) on [both](https://www.instagram.com/Ologies). Thank you to everyone, again, for supporting on [Patreon.com/Ologies](https://Patreon.com/Ologies), if you want to ask questions and get some behind-the-

scenes stuff. Ologies merch is available at [OlogiesMerch.com](http://OlogiesMerch.com), that's managed by Shannon Feltus and Boni Dutch - two sisters who host a comedy podcast called *You Are That*. You can check that out if you're looking for a new one.

[Bleeped episodes](#) and transcripts are at the link in the show notes, and thank you to all the Ologies transcribers and Emily White for heading that project. Thank you to Caleb Patton for bleeping episodes.

Assistant editing was done by Jarrett Sleeper of the mental health podcast *My Good Bad Brain*. He hosts weekly livestreams on Sundays at 10 am PST with Traumatologist Dr. Nick Barr, and those are so great, especially these days.

Thanks as always to lead editor and just the nicest 'business goose' you can ask for: Steven Ray Morris who hosts the kitty themed *Purrrrcast* and the dino-themed *See Jurassic Right* podcasts.

Nick Thorburn wrote and performed the theme music, he's in a great band called *Islands*, so do check them out.

If you stick around to the end of the episode, you know I tell you a secret. This week's secret is that I'm down to my last roll of toilet paper. We've got two boxes of Kleenex on standby but at this rate it was gonna take a very long time to get any ordered, and there's none on shelves. So I did it. I got a bidet. I ordered a bidet; it came in the mail yesterday. I spent an extra \$29 for a warm water option 'cause I'm not about to shoot an icicle at my butt. Yet to be installed, stay tuned. We're getting through this together.

All right - stay home, stay in, stay safe, rest up. Talk to you next week. Berbye!

***Transcribed by:***

*Your pal Aska Djikia.*

*Mara Spensieri*

*Madison Hughes*

*Mickey McG.*

***Some links which may be of use:***

[\*Here is what penguins look like!\*](#)

*Dr. Hart's papers:*

[\*High-coverage genomes to elucidate the evolution of penguins\*](#)

[\*Divergent trophic responses of sympatric penguin species to historic anthropogenic exploitation and recent climate change\*](#)

[\*Flim-flam: toppling penguins\*](#)

[\*More on airplane flimflam\*](#)

[\*Here's what penguins look like!\*](#)

[\*Vintage penguin poster\*](#)

[\*"Homewrecking Penguin"\*](#)

[\*Penguin catfight\*](#)

[\*Porg backstory\*](#)

[How penguins molt](#)

[Same-sex penguin pairs](#)

[Macaroni penguins](#)

[Penguin feathers](#)

[Penguin preening](#)

[Grease spigot on bird butts](#)

[Huge-ass prehistoric penguins](#)

[Business goose](#)

Transcripts & bleeped episodes at: [alieward.com/ologies-extras](http://alieward.com/ologies-extras)

Become a patron of Ologies for as little as a buck a month: [www.Patreon.com/ologies](http://www.Patreon.com/ologies)

[OlogiesMerch.com](http://OlogiesMerch.com) has hats, shirts, pins, totes and STIIICKERS!

Follow [twitter.com/ologies](https://twitter.com/ologies) or [instagram.com/ologies](https://www.instagram.com/ologies)

Follow [twitter.com/AlieWard](https://twitter.com/AlieWard) or [instagram.com/AlieWard](https://www.instagram.com/AlieWard)

Sound editing by [Jarrett Sleeper](#) of MindJam Media & [Steven Ray Morris](#)

Theme song by Nick Thorburn

For comments and enquiries on this or other transcripts, please contact [OlogiteEmily@gmail.com](mailto:OlogiteEmily@gmail.com)