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Audio Transcript: Tales from the Decant: "Getting into the Spirit of Things" with Zoology Curator, Dr Amy Geraghty

Video Length – 29:08

Time Stamp	Audio Transcript
00:08	Hello everyone and a big warm welcome to you all. My name is Geraldine and I work in the Education Department here at the National Museum of Ireland - Natural History and thanks very much for joining us today, as we dive deeper into the next topic of our online talk series, Tales from the Decant. Today's broadcast is a closed YouTube live event with a pre-recorded talk that will last about 15 minutes or so and we will then go live for a Q&A. The entire event will be posted online at a later stage so you can catch it again. If you would like to ask any questions, and we hope you do, or post some comments, please use the chat feature on YouTube and please be aware that to post a question you will need to have a YouTube account. Now I know I shouldn't have favorites but I think the title of today's talk may be the winner of the series so far for me. Please welcome my colleague and Zoology Curator for the Museum, Amy Geraghty, for her talk "Getting into the Spirit of Things". Hi Amy, How are you?
01:16	AMY - Hi Ger, I'm good. How are you?
01:19	GERALDINE - Brilliant, oh thank you so much for joining us today. I'm really looking forward to hearing your talk. Where are you today Amy?
01:25	AMY - I'm actually off-site in the storage building for the Museum, so I'm actually surrounded by a lot of the collection I'm going to talk about today.
01:33	GERALDINE - Brilliant. I can see some of them in the background there, they look very interesting and I'm looking forward to learning more about them, so I will hand straight over to you now Amy and you can share your presentation. I'll see you later for the live Q&A.
01:45	AMY - See you later, Ger. Hi my name is Amy Geraghty. I'm a Zoology Curator in the Natural History Division in the National Museum of Ireland. I've been in my role for about a year and in that year I've been assisting with the decant and mainly caring for the spirit collection. So I thought those were the best things to talk about. So for my talk, I'm going to be talking about getting into the spirit of things, which will mainly be concerned with aspects of caring for the spirit collection and how we safely moved it from the Museum to the storage place or building where I am today. And first off I

	think I should start with what is the spirit collection but before I answer this I should really ask why do we need a spirit collection? Why put things or preserve them? And it's to help people doing research on the past and if they identify a species they should lodge it with the Museum and in order to be able to keep that specimen or check on it and we have to slow down the rotting process, so we have to use chemicals to slow it down to almost an imperceptible level. So we can have specimens dating back to 1899 or even further and they will still look or resemble the specimen, obviously a bit paler, -the colour is lost out into the preserving liquid - than it did when it was captured, but it will still be roughly the same shape, size and look of what that biological specimen was when it was captured. Spirit collections preserve things very, very well. So what is the spirit collection? It's known by many names including the fluid collection, the wet collection, or the pickle collection. It is any biological specimen in liquid. This liquid is usually alcohol and it's kept in it to preserve it over a long period of time. There are over 31,000 containers in the wet collection. This all together is roughly over 25,000 liters of alcohol. This is about one tenth of an Olympic-sized swimming pool and the liquids usually are industrial methylated spirits, which is a type of alcohol called ethanol, with about five percent methanol on top, then pure high-strength ethanol and then a chemical mixture called formalin.
04:03	AMY - Now, over 25,000 liters of alcohol isn't all together. It's in individual containers. Now how many specimens are in the liquid collection? That is a good question and it is actually harder to answer than you would think. Sometimes containers, contain containers, as you can see here from examples I've put up, from the spiders, mites and starfish collection. Containers can contain multiple specimens taken or sampled at particular places in particular times or they contain multiple specimens taken at the same time in place of the same species.
04:43	AMY - So back in 2001, we had an inventory project where people had to go and record as much of each collection in the Museum as they could, its location, the amount. And in order for them to be able to eat, sleep and go home they had to stop at the unit of a container. So where are the spirit collections kept? They're actually divided between two locations, the Museum on Merrion street and an off-site storage building where I'm sitting in today. So in the museum there are actually over 2,000 specimens in spirit on display and just under half of these are Irish, just about 45 percent, the rest are from all over the world. And they can be a range of specimens, either demonstrating the life cycle, for example this midwife toad, it could be a historic collection, for example this flying gurnard donated by McClintock the Arctic explorer born in Dundalk and famous for his exploration into the Arctic and time in the British navy. They can also be donated, as with this tapeworm which can illustrate some of the dangers the natural world posed. Now there are over 1000 specimens in the Museum but the rest of the collection is stored off-site and where these are stored are open racking shelving, which we can see here to your right, steel tanks, which hold larger

	specimens, such as skates and rays and then we have wooden presses called spirit presses. There are over 220 of these in the collection.
06:19	AMY - Now the majority of the collection is kept in the industrial methylated spirits or IMS, however, smaller volumes of different alcohols are used to preserve some specimens and I have two nice examples of them. The first one is the Irish whale and dolphin tissue bank. It started in 2001, it's supported by the Heritage Council and Irish Whale and Dolphin Group and it is a great example of a citizen science project. Volunteers sample any whale or dolphin they come across stranded on our coast all over Ireland and then they send the sample into the Museum. These samples are kept in high strength ethanol, because it's a really good alcohol to store tissues in if you want to extract and use DNA. So it started in 2001 and now in 2021 we have processed our 1,000th sample. We have also had studies published on the pilot whale samples in the tissue bank. Now another example of a specimen that can't be kept in IMS is this deep water snail, it's called the scaly footed gastropod or, Chrysomallon squamiferum. The reason why it can't be kept in IMS is that it would rust! It incorporates iron into its tissues because of its unusual habitat. It has been recorded three times in the Indian ocean next to hydrothermal vents at depths of two to three thousand metres, so there is no light and extremely high temperatures in these environments. It has to synthesize food with bacteria in its gut, and its iron is meant to help it withstand those high, high temperatures and you can actually see the iron-y scales in the specimen here on the far right. It was donated in 2015, so we keep an eye on this specimen.
08:09	AMY - Now back to the majority of the collection. How do we look after it and what do we have to do to ensure it's well maintained? So every year we go around and check in the contents of those 202 spirit presses and we check for things like, the containers, the lids, we check up the volume of liquid in the containers and we check on the strength of the alcohol and we have to check on the strength of the alcohol because the volume could be the same but due to the fact that alcohol evaporates at lower temperatures or at a faster rate than the water, the specimen could be submerged in the volume, but still be below a certain concentration. And the concentration we want to keep it at is roughly 50 and above. ideally around 70 to 80% IMS, because below 50 the alcohol in solution doesn't inhibit the biological process, so your specimen will start to degrade, tissues will swell. And I know, I have a couple of examples up on top of what can go wrong, so from left to right, we have a plastic container that has cracked, so all the solution has gone, we have one specimen that is out of the solution and a cracked plastic lid, also on the far right we have some labels that have fallen off the container so they need to be reattached so we can keep the information with them. So although these are all examples of what can happen when things go wrong I'm happy to report our spirit collection is very healthy. As you can see below, the vast majority of our collection fall in that 70 to above 80% concentration for IMS.
09:48	AMY - Also I just want to flag, some people might have noticed that we have different coloured lids in the right picture and that's because we're marking these specimens as 'types' and what a 'type' is, means that individual in that

	container is the basis or was the original specimen that species was described as. So when a species is discovered it's fully described, there's a publication and then the specimen, which that description is based on has to be lodged with a body like a museum. So we take extra special care of types in museums. Now where did we move the collection that is in the Museum? Mainly from the upper balconies, so unfortunately it is the places that have not been opened to the public for a while. There is a 3D tour of the Museum however if you want to see what it looks like. So what did we move or how did we move the collection? Carefully, is the short answer but for the more detailed one I'll walk you through the process. We carefully removed the display specimens from the cabinets. You tie them to a black box reinforced with cable ties, with a particular type of tape called 'museum tape'. We'd secure all of them together and then we place them in a leak-proof crate on top of absorbent material and then brace it with a bit of foam called plastazote, which is really resistant to moisture and friction kind of foam. We then have to keep a record of this, so this is an example of the number that would be on that black crate, then we have the original location of the specimens written on in tape and then they'd be moved by contractors such as Morris Ward or William Traceys and then they would be unpacked on site in storage where I am now.
11:32	AMY - And below is the example of the kind document we'd be using, so you'd have the location, the number of specimens, its scientific name, the crate it was going into, and any notes. So again you'd be looking to see if its volume was okay, if the strength of alcohol was okay or if there was anything else that you needed to note of the specimen and the date you moved it and who moved it. Now what did we move? We moved a lot. We moved over 1000 objects and presses which could be research and reference material, was mainly arthropods, so things with a hard exoskeleton and we moved over 600 display specimens, including McClintock's 'Flying Gurnard', which I talked about earlier. So we moved things like fish, worms, reptiles, molluscs, birds. And over here we have an example of what was removed from the presses. So this is a caddisfly research collection. The previous entomologist, I know Aidan O'Hanlon gave a talk, but Dr Jim O'Connor was the one really interested in caddisfly, so we took a lot of care moving them back to the premises where I am now. So to start talking about the importance of some of the historic and display specimens, I really have to flag up an expedition called the HMS Challenger Expedition. And it's actually quite hard to overstate the importance of this expedition. It was an expedition that put science to the forefront. It began modern oceanography. It took four years, they sailed all over the world and they had 354 stations, which they tried to take scientific measurements of the physical characteristics of the water, the chemical characteristics and tried to sample biological specimens.
13:13	AMY - Now at the end of the voyage they distributed these biological specimens to international experts and the results of the expedition were huge. They discovered over 4070 species new to science, they produced 50 volumes of a publication or scientific publications that were each the width of a family Bible. And the Museum itself holds over a thousand specimens from this historic expedition, because we were sharing, we were invited over by

	the British Museum in London, or Natural History Museum London, to take some duplicates in their collection, particularly of the deep sea fish. This was back in 1899 and you can see the entry in our register. So you can see on August the 8th a collection of specimens from the Challenger Expedition were given to us by the British Museum. Interestingly, quite important biological specimens called 'types', which is what the specimen in which a species description is based on were not marked, so our Museum actually holds a lot of scientifically valuable specimens of deep sea fish. A great example of that is the 'stargazer' from the Kai Islands. You can see a picture of it here and because the preservation has worked so well, you can still see the morphology, or shape, and size of the fish, all the way from 1872.
14:38	AMY - Now this is actually an ambush hunter. You can see the eyes on the top of its head, that's because it will burrow into sediment, wait till something swims above or by and [clap] capture it. Next year will be the 150th anniversary of the Challenger Expedition and interestingly, also, we're looking to investigate more into this, because some of the biological specimens in our collection were used for models for Blaschkas or other works of art.
15:08	AMY - Now with that in mind, I hope I've shown some of the variety and the importance of the spirit collection and I'd just like to talk very quickly about some of the uses of it, or really I'd like to encourage people to think about using the collection. Over the last couple of months the collection has been used by artists, writers and scientific researchers and because the specimens are preserved, they can sample or almost go back in time back beyond 1899. So it is a huge potential resource to use to investigate or to compare the past to the present and potentially make accurate predictions for the future. The collection is also growing. We didn't stop in the interest of the Museum with the Challenger Expedition and we continue to acquire new specimens today. One of the important acquisition made by the museum in 1999 was all the specimens from the BIOMAR survey, which looked at a lot of marine environments in Britain and Ireland and from that we have a huge number of specimens. And that's it, I hope I've covered some of the interesting topics with the spirit collection and I look forward to your questions.
16:16	GERALDINE - Welcome back everyone and thank you so much. We are now live at the Museum. And first of all, I just want to say apologies for our tech issue that we seem to be having there. The aspect of the talk was slightly off on YouTube but we will fix that in post-production before the talk is made completely public on YouTube. So sorry about that guys. And Amy, thank you so much for that wonderful talk, I really enjoyed it and I've learned a lot about the spirit collection that I just wasn't aware of before, so thanks very much.
16:51	AMY - Well thank you and thank you for letting me give the talk as well. I'm glad you enjoyed it, it was a bit harder watching yourself back and I have a list of kind of things I'd like to address later but we'll go through the questions.

17:05	GERALDINE - Oh listen don't worry, I know the feeling! But listen now, I just want to say that it is time for some questions, so please if anybody does have a question, please pop them into the YouTube chat. Questions, comments, shout-outs please, all are welcome. I suppose, Amy, the HMS Challenger story and connection is really interesting and fascinating and I'm not surprised we have a question here about it in the comments. So Emma is wondering, 'are there any particular examples of how the HMS Challenger Expedition's marine samples have contributed to science today?'
17:46	AMY - There are, there is one in particular that came out really recently, just last year in fact and it was published in nature's scientific reports and it looked at samples that the scientists took of a really, really small, single-celled animal with a hard chalky skeleton.
18:05	AMY - And they're interested in, they also took samples from the Tara Oceans Expedition that happened also more recently than 1899 but because they have those two points in time they can start looking at how the, foraminifera they're called, form their skeletons, so they can start investigating factors like ocean acidification because they have a lot of data for those two really clear points in time and make kind of really nice comparisons between the two.
18:35	GERALDINE - Brilliant, fantastic, so that's good for kind of like climate change, showing the differences, yeah so, it just goes to show how important museum collections are then.
18:47	AMY - Absolutely.
18:48	GERALDINE - Yeah, that's fantastic and it was really interesting to hear that it's the 150th anniversary next year of the Challenger Expedition, so no doubt there will be events and talks, workshops all around the world to mark the occasion, so I'm looking forward to that. And there's a few people.
19:05	AMY - Just on the topic of the HMS Challenger, I have my first mistake I'd like to pick myself up on. I think I said there was the expedition discovered over 4070 species, it was actually even larger: 4700 species.
19:19	GERALDINE - Wow that's fantastic. Thank you for that. There's a few people who are doing some shout outs here, so Patrick says, 'thank you for the talk, are there any standout specimens in the collection and what are some of your favourites?'
19:35	AMY - Well I do like that deep sea scaly footed gastropod, it is just bizarre looking and when I was going around for my, not that I have favourites, but that was incredibly interesting even to just go around when I was doing my annual check on it. And that really jumped out as a very unusual snail.
19:56	GERALDINE - I love the fact that we have a giant squid but you were saying earlier so it will be going into the spirit collection but right now it's...?

20:05	AMY - It might go into the spirit collection, it might go somewhere else. It has been donated to us but at the moment it is a bit of an ice cube. This is what we do before things go into, say for example, the dry collections or the spirit collections. So it can be donated by a member of the public, a researcher or a whole collection actually can be donated to the Museum. If it is going to go into the spirit collection, what we do usually is, we defrost it first and then it goes through a chemical process, which kind of stops that rotting, or degradation, called fixation. It's a way of chemically kind of changing the proteins or the tissues of it and then it goes into some alcohol, or IMS, and it gets stepped up to that 70 or 80% concentration.
20:49	GERALDINE - Great and here's a comment from Beverly, she says, 'that was fascinating and I don't think I had any idea at all of what was meant by the topic of this talk but it sounded interesting enough to have a go.' Well good on you, Beverly, and that's great that you found it fascinating. It is, it's such an unusual collection, it is kind of the more elusive of the collections, I always think, you know because yeah, the stuffed animals in the Museum kind of stand out the most. The spirit kind of hides in the background and like that its more of a behind the scenes collection, there's so much more behind the scenes. And let me see and there's some more questions here. Oh, 'do you know what is the oldest sample in the collection?', somebody's asked.
21:31	AMY - So that is a really good question, much like how many specimens are in the collection? It's one of those things that initially seems like quite a simple answer to have to hand, but I'm looking into it, is the short answer, and the longer answer is, most likely specimens preserved in spirits or alcohol actually predate the Museum, back when it was the Royal Dublin Society collection. However, we really like numbers and identifying features; we give them a two part or three part number now and that only began in 1877. So I have one of the older specimens on display, if people would like to keep an eye out for it when we are open again and it is an 'Arctic char', it was donated in 1877 or 1875 and it was donated from an Arctic expedition on the HMS Alert but you'll see it with a really unique number, but you'll see the 1877 as the first part of those three series and that will be your hint that it is one of the oldest specimens in the spirit collection on display.
22:38	GERALDINE - Wow great, that's good to know. Anne asks, 'would the collection be shared with other countries today or are you still accepting other items for your collection?' Or into the collection. Are we still adding to the collection?
22:52	AMY - We absolutely are, as with all the other collections in the Museum it's an ongoing process. The collections are always growing and one really interesting thing I should have mentioned, which I'm kicking myself for not doing because we exchange specimens, we loan them all the time to experts in the field. Like going back to the HMS Challenger, how they distributed to experts all over the world, experts are located all over the world. So say for example, you have an expert in a deep water crustacean and we have a specimen, they write into us, they have a loan application that will have to be assessed and approved by the Keeper of the Museum, Nigel Monaghan, and

	from there, if it is approved and if the research, sorry excuse me, well it is research and if it gets approved we'll send it out to them and they'll exchange. So we have people donating things, members of the general public, maybe academics are retiring so they leave us their personally curated collection, which is a really nice thing and then also taxonomists, which are experts in biology at identifying a particular animal group, we exchange a lot with taxonomists or they would be the ones either or an academic institution would be the one sending in the application.
23:59	GERALDINE - Great and you mentioned, so obviously yeah, lots of researchers, scientists use the collection, but you mentioned in the talk as well, artists or writers can also use that as inspiration, which is fantastic.
24:11	AMY - I never knew either before.
24:14	GERALDINE - Yeah I know me included. Somebody asks here, 'the majority of specimens we saw seem to be marine, does the collection include a significant number of terrestrial specimens and how do they differ from the marine specimens?' I presume they mean like is there a different kind of application to them?
24:32	AMY - That's a really good question and then there's two parts to that. I think I've just revealed that I'm biased, I have a background in marine biology, so the examples that jump to my head tend to be from the marine but no you're absolutely right there are loads of terrestrial and freshwater examples. And they're stored the same by and large, 99% of them, however, when you're putting them through that chemical process, before they go into the alcohol say for example if it's marine and rather than have the tissue swell you might have a bit of something in there like salt in the fixative or in the chemicals to help the tissues just change before they're put into the alcohol but if it's fresh water you would check that there was no salt, you try to keep it around the same concentration or as similar as it would be to their actual habitat or environment, so you don't shock the tissues. So they still look representative or they still look like the species that they're in there as, yeah.
25:25	GERALDINE - That's important. Yeah that's good and Karen just added, 'how often do you need to swap out the alcohol to keep the specimens in good shape?'
25:33	AMY - So that again is a really good question. Generally we don't try to swap, we top up and I recently was on a course, which said even if you top up the specimens or you replace it say for example it might get discoloured, you can't see the specimen, there might be something strange going on and they tend to go a bit orangey, for example, fats tend to migrate out of the specimens. So they can almost like, if anyone remembers the tests in primary school, you get your brown bag and you rub it and it becomes translucent? So the fats then can start to affect, say for example, labels in there or form a layer on top and we remove those and then we would check the strength of the alcohol but unless the specimen is completely dehydrated we don't tend to take out all the alcohol we just tend to top it up and check the concentration.

26:27	GERALDINE - Great well time is flying by, we only have time for one more question, so sorry everybody if we didn't get to your question, and this one is from Aidan and it is, 'what is the largest specimen in the Museum spirit collection?' Do you know Amy?
26:42	AMY - So again, I'd have to look, it might be in those steel tanks, but off the top of my head and this gives me an opportunity to correct one of the second mistakes I made, I referred to the tissue bank as the Irish Whale and Dolphin Tissue Bank, they contribute to it greatly and they run the volunteer stranding network but it's called the Irish Cetacean Genetic Tissue Bank, but also I know within that there is a sample from a fin whale which, I know it's another marine example, but it is one of the largest animals, particularly in our waters and in the world, so that would be the largest specimen but it's a sub sample of a tiny bit of its skin, so it's not as impressive.
27:24	GERALDINE - I was just going to say, is it like a giant whale? Brilliant, yeah well fantastic. Thank you so much Amy and yeah, just to say thank you so much for your brilliant talk and we very much look forward to future talks and events with you.
27:42	AMY - Thank you so much for giving me the opportunity and I look forward to the future talks and questions as well.
27:46	GERALDINE - Great, yeah the questions were fantastic. Thank you so much everybody for participating today and participating in the YouTube chat, it's fantastic to hear all your comments and and questions. And this talk, like I said, will be made public in due course. You can of course, once you have the link, re-watch it again and again, but maybe please wait till it goes public, so we can have the correct aspect up and again apologies about that tech issue. I do have a favour to ask, which is please take two minutes to fill out the online feedback form that is being sent to you via Eventbrite. Your feedback really helps to improve and inform our future events. I also have just one last juicy nugget of information before I go, which is would you like to learn more about museum collections and the ongoing renovation work of the Museum? And if so then you might like to sign up to our next talk 'Conversations about the Dead Zoo', which is part of the Open House Festival and is on lunchtime Friday the 15th of October and it will feature a chat with Zoology Curator, Paolo Viscardi, and also Aoife Hurley who is an Architect and Head of Operations at the National Museum of Ireland. Booking is required so please sign up via Eventbrite. That's all for now folks. Thank you so much and we'll see you again. Goodbye. Thank you.
29:05	AMY - Bye guys.