Show and Tell: 'Volcanoes' with Hazel Rymer and 'The Reading Experience Database' with Francesca Benatti

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KAREN: Welcome back to 'The Student Hub Live'. Well, it's our show and tell session. And you've all been asking what a vulcanologist does, and saying, what a cool job. So we're going to start with Hazel Rymer, who's just been a guest on our big conversation. Haz, you brought some amazing things to show us today. What's all this then?

HAZEL RYMER: What's all this? Well, I brought these pieces of obsidian rock because they're so pretty, actually. They are bits of lava. And this is one of the more spectacular things that comes out of a volcano.

But, actually, what it is, it's a lava flow that is so thick and slow-flowing it's a bit like toothpaste or something like that erupting really slowly. And it makes these big, billowy type lava flows. And they're really very pretty when you crack them open. So I brought that just because it's pretty.

My job is about finding out whether underneath the ground you've got new magma that's coming up. And I'm interested in whether it's fizzing, and getting full of bubbles, because that's what makes it explode, go bang. So I've got this bubbly piece of rock here. This is the sort of things that you might get at the top of a column of magma inside a volcano.

And as this column of bubbly stuff gets thicker and thicker, you're getting more and more gas build-up. And that's the sort of thing that you need in order to drive an eruption. So it's very important to be able to make measurements to see whether this sort of accumulation of frothy foam type thing on the top of the magma is forming or not.

And if it's not forming, then what you've got is this much denser material. It's made of exactly the same stuff. And both of these came from inside a volcano.

This sort of thing tends to flow out quietly as a lava flow. This sort of thing tends to come out as an explosion. And, of course, we were talking about risk and hazard earlier on. The risk is a bit different. You've got a lava flow which you could walk away from, or something that's going to explode and then land on. It's more difficult to walk away from, broadly.

KAREN: So how do you get hold of these, then? Are these things that you would then find when you're on your field trips, and looking at things, and then looking at how much air, effectively, is in them?

HAZEL RYMER: Well, yes, what you do -

KAREN: How to be a volcanologist, that's what we really want to know.

HAZEL RYMER: OK, well what you want to know is what type of volcano are you on? And what type of measurements would be useful to make in order to be able to work out what's

going on underneath the ground? So the types of volcanoes I'm looking at have this structure that I'm talking about, where you've basically go to a column of magma underneath the volcano. And the thickness of the foam on top changes through time.

And so I use something called a gravity meter. Now, that's very technical stuff. And here is my very un-technical looking gravity meter. I love it. It's my little pet here.

And when we measure gravity with these things. And what we do is we have a series of points all over the volcanoes that we're monitoring. And we go back to them at least, say, once a year. But during our field trip it would be 10, 20 times we would go back to each of these stations to make our measurements. So we do it many times on a visit, but then go back every year.

And we see how the value of gravity, the acceleration due to gravity, has changed at that point. And that measurement gives you an indication of the thickness of the frothy layer at the top of the volcano, broadly. So that's what we do. And we do it with this really unimpressive looking piece of kit.

KAREN: Well, Devin wants to know where these volcanoes are. Aren't a lot of them under the sea, some of the larger ones? And how would you then go about researching them?

HAZEL RYMER: Well, people do research those volcanoes, of course. And there are measurements being made at those. And that is where most of the volcanoes are. But the ones that I'm talking about where you've got this frothy layer building up, these are typically the ones that you would find along the Pacific Ring of Fire.

So the volcanoes I'm working in are in Costa Rica, and Nicaragua, bits of Central America.

KAREN: Wow.

HAZEL RYMER: And that's where two of these rocks come from. Something else I was going to say is that it's all very well predicting - well, trying to predict when an eruption is going to happen, or even trying to better understand how volcanoes work. But in a way, who cares?

It really matters if there's going to be an impact on human life or other life, and an impact on the environment. So something that we also do - and we make these in the labs here in Milton Keynes, another very high tech piece of kit. It's a tiny Petri dish. And inside, we have this lead oxide goo.

So, obviously, I've exposed this one. So we couldn't use this one. But we make them, we seal them up. And we take them into the field. And then at a particular time, we open it up to the environment, and attach it to a tree, or somewhere that we're testing what the environmental impact of the volcano is.

And, in particular, this one will tell us about the dry deposition. That's the dry particles of, in this case, sulphur, coming out of the atmosphere. And that would be due to the volcanic pollution.

And so we have a whole bunch of these all around the volcano. And we leave them exposed for various amounts of time - couple of weeks at a time sometimes. And we can see how the amount of pollution changes through time. And we can then look at how that compares with, for example, our gravity measurements. And we can see how the thickness of the frothy layer at the top of the magma column, how changes in that relate to the downwind pollution. And so that gives us an idea about the environmental impact, which is really what's important about the volcanoes.

KAREN: Wonderful. Well, our chat room is erupting with talk. And people are very interested. And it would be brilliant if you could give us some links, because people do want to find out more. And we'll put those on the Resources page of the website.

But I'd also like to make room for Francesca. So I just want to ask what's in that pot?

HAZEL RYMER: Well, this is Pele's hair. This is absolutely stunning stuff. Well, you tell me what you think it is.

KAREN: It looks like hair. But it looks metallic almost. It's like -

HAZEL RYMER: Well, both right, in a way. It really does look like hair, doesn't it?

KAREN: Yeah.

HAZEL RYMER: And when I first saw it, I actually thought that it looked as though a mule or something had laid down and lost some of its hair, except it was in the bottom of a volcanic crater so it seemed a bit weird.

So it's actually lava, it's magma. When you have a lava lake - so you've seen these before, sort of bubbling red lake, really exciting. When you get a massive blob up of gas coming through, it breaks. And, effectively, it's the surface of the bubble, these tiny little fragments of glassy rock. And as they get sent off by the wind, they turn into these beautiful little filaments. And it's called Pele's hair, after Pele, of course, from Hawaii.

KAREN: Wow, absolutely fantastic. Well, thank you so much, Hazel, for bringing those in - really, really interesting, and great to see some applied stuff here as well. So thank you for that.

And Francesca, you're coming to show us about the reading experience database because, of course, you came on our big conversation the other night. And we were talking about living in a digital world. And you were mentioning some of the ways that we're looking at how people have this experience reading. So I was hoping that you could show us what this is all about, and how our people can engage with this also when they're watching?

FRANCESCA: Sure, the reading experience database is a research project that has been going on for more than 10 years. It's based in the Arts faculty. And it studies an activity that definitely has an impact, a big impact, on human life. And that's reading. We've been reading for centuries, thousands of years.

We concentrate on studying how people - real people, not critics or academics - but real readers, have encountered books, lectures, playbills. We accept a wide variety of types of reading. From 1450 to 1945, we are a crowdsourced project.

KAREN: 1450?

FRANCESCA: Yeah, till 1945. Most of our evidence at the moment is for the later period - so from 1800 to 1945.

KAREN: And this is all on the computer here that we can see?

FRANCESCA: We have over 40,000 entries. And they've mostly been contributed by volunteers who have transcribed letters, diaries, documents that bear witness to a person or persons encountering a text. And you can search the reading experience database in many ways to find out more about maybe what your favourite author used to read while she was composing her books.

Here, I have in the search page, I'm going to look for what Jane Austen read. Yes, at the moment, you could probably skip the advanced search. And you'll have 90 entries.

And you can find out that Jane Austen, for example, used to listen to her father reading out books aloud. That was very common in the past. And what she though about other books, maybe what she was reading while she was composing her most famous works.

Also, you can search for what other readers over the centuries have thought about Jane Austen. So if you type Jane Austen into the 'text being read' box, you can find out what 275 different readers have thought about her. For example, Princess Charlotte, daughter of the Prince Regent, loved Jane Austen.

And she particularly identified with Marianne, the 'sensibility' character in 'Sense and Sensibility' because, like her, she was a very strong-willed young lady. Other readers had a much more big stop, I suppose, opinion. Charlotte Bronte, the author of 'Jane Eyre', was kind of lukewarm. Jane Austen wasn't passionate enough for Charlotte Bronte's tastes.

And, as I said, we have over 40,000 reading experiences. And we're always happy to accept contributions. So there is a contribute page where you can submit.

KAREN: So anyone can add to this about their experience?

FRANCESCA: It's got to be recorded reading experiences - so reading experiences that you find in documents - in printed books, letters, diaries, and so on. That's why we stop at 1945. There are projects to extend to the modern day, and consider, for example, reading experiences reported in social media. So that's one thing that we'll do in the future.

KAREN: Our chat room is saying this is dangerously interesting. And they're going to have lots of things to - in addition to all the stuff you've got to read anyway from all the shelfies we've been receiving.

FRANCESCA: So here's the Twitter page for the reading experience database, @theUKread. And next year in 2016, we're going to launch a series of live events across the UK. We'll have

days in Belfast, Birmingham, Edinburgh, Liverpool, and London. So if you want to know more about us, look out for an event near to you. We'll be announcing them through the website and Twitter.

And as a final thing, if you want to dip your toe in to study the history of reading, there is a free OpenLearn course on the history of reading with an excellent chapter on Jane Austen as reader and Jane Austen's readers.

KAREN: Wonderful, well, thank you so much for showing us that. I know that our chat room are off to go and have a look at that now. So those links are also on our Resources section of the website. But Hazel and Francesca, thank you for coming and showing us some really interesting things. We're going to have a short break now with some video clips. And then we're back for our philosophy cafe.

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