



## Science Magazine Podcast

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### *Promo*

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### *Music*

#### **Interviewer – Kerry Klein**

Finally today, I’m Kerry Klein and I’m here with news writer Carolyn Gramling, filling in for David Grimm, and she’s here to give us a rundown of some of the recent stories from our daily news site. So Carolyn, in our first story, we are talking about a creature that we love to make fun of.

#### **Interviewee – Carolyn Gramling**

Yes. When people think of lemmings, they probably think of a giant wave of rodents crashing off of a hillside into the ocean. But, in point of fact, they don’t actually commit mass suicide in that way. However, they do have these periodic population booms. These are Arctic rodents, by the way. And so as a result of their population booms, they tend to migrate en masse, and that sort of what gives rise to that myth. So their numbers wax and wane over a four-year cycle. And around the turn of the millennium, scientists noticed that they actually did not have their expected population boom in their habitat in northeastern Greenland, and so they were interested in why this was the case. They believe that that’s due to changes in their habitat due to global warming. But the thing is that lemmings are actually a popular prey for a lot of Arctic predators, and low lemming numbers, therefore, actually have a really significant impact on those predators also. So it spells big trouble for the predators, such as, for example, stoats and a type of seabird known as a skua.

#### **Interviewer – Kerry Klein**

Okay.

#### **Interviewee – Carolyn Gramling**

It spells big trouble for them because their prey is vanishing.

#### **Interviewer – Kerry Klein**

That’s right.

#### **Interviewee – Carolyn Gramling**

So a lot of them are potentially going – locally, at least in these regions in Greenland – maybe going locally extinct.

**Interviewer – Kerry Klein**

So what does this mean for these predators? Is there any chance of them bouncing back?

**Interviewee – Carolyn Gramling**

Well, one of the things that they're looking at now with some of the predators is, you know, whether or not they're able to prey switch. And that's also a big issue. Some of them are, some aren't. The ones that are, they might be switching their prey to more migratory birds, for example, but of course then that becomes a problem for the migratory bird populations. So it's very interesting because ultimately the point is that the plight of the lemmings is actually felt throughout the entire Arctic ecosystem.

**Interviewer – Kerry Klein**

Indeed. We can add this to the list of new patterns emerging as climate change continues.

**Interviewee – Carolyn Gramling**

Yes, indeed.

**Interviewer – Kerry Klein**

Okay, and in our next story, we're talking about a highly anticipated dengue vaccine.

**Interviewee – Carolyn Gramling**

Yes. This is something that scientists have been very eager to develop. They're looking for a new vaccine for dengue fever, which is an infectious tropical disease that affects about 100 million people – mostly children – worldwide. And this is a disease...

**Interviewer – Kerry Klein**

And that's every year.

**Interviewee – Carolyn Gramling**

And that's every year, yes. And that is a disease that is caused by a virus and is spread by mosquitoes. And the trick is with dengue that there are actually four variants to this disease – to the virus – and right now, of course, there are no approved vaccines for it. But any ideal vaccine is going to be both safe for the vaccinees, and also will protect against those four variants.

**Interviewer – Kerry Klein**

And so these were the first clinical trials for a new dengue vaccine. Clearly there's a high demand for it. How did the trials turn out?

**Interviewee – Carolyn Gramling**

Well, there are sort of mixed results. So what they did in these trials was they tested more than 4,000 children in Thailand, splitting them into control groups and into vaccination groups. And what they found was that while the vaccine was fairly effective against three of the types of virus, of dengue virus, it actually did not at all protect against the fourth type, which also happens to be the type that is responsible for the most severe illness in the world and is also currently circulating in Thailand.

**Interviewer – Kerry Klein**

So it's not quite accurate to say that the vaccine is 75% effective.

**Interviewee – Carolyn Gramling**

No, not exactly. They do really want something that is going to be able to prevent against all four, because incomplete protection could actually be very dangerous for the vaccinees. So what they're trying to do now is they're actually testing the vaccine in 10 different countries around the world among 31,000 people, and those results we won't actually see until 2014. So they're not yet able to say what's going to come next with this vaccine.

**Interviewer – Kerry Klein**

Well, alright. And our third story today sheds some light on bioluminescence.

**Interviewee – Carolyn Gramling**

Yes. Bioluminescence is something that is very common to a lot of different marine species. They use it often to find mates, or to also find food, or as a way of avoiding predators. So we've known that a lot of floating creatures exhibit bioluminescence – this light that they emit.

**Interviewer – Kerry Klein**

And so we do already know a lot about bioluminescence. What's new in this story?

**Interviewee – Carolyn Gramling**

Well so these researchers were actually interested not just in looking at the kinds of creatures floating in the ocean that show bioluminescence, but what creatures on the sea floor bioluminesce. And this is something that has been a lot less studied. So they were looking for organisms, such as sea anemones, coral, shrimp, crabs, that sort of thing that crawl around on the sea floor – so-called benthic organisms.

**Interviewer – Kerry Klein**

And so what did they find?

**Interviewee – Carolyn Gramling**

What they found was that actually about 20% of these species do show bioluminescence, and that was higher than they originally expected. But what's also really interesting was not just how many of them showed it, but how often they glowed. And what they thought was that this might have to do with what actually prompts them to bioluminesce. That has to do with how often they actually bump into other objects. Usually these creatures would start to glow when you touch them. What they hypothesize is that creatures floating in the ocean actually don't bump into other objects very often, so that doesn't prompt them to glow. But the creatures crawling around on the sea floor, they're going to hit other creatures, or bump up against corals, or be jostled by other objects, and so that causes them to glow quite often.

**Interviewer – Kerry Klein**

And so this sort of addresses the bioluminescence paradox, if you will, that there are fewer creatures that bioluminesce towards the bottom of the ocean, but that they luminesce more because of this proximity.

**Interviewee – Carolyn Gramling**

Yes, exactly.

**Interviewer – Kerry Klein**

So the title of this story actually includes vomiting shrimp. What role do these vomiting shrimp play in this story?

**Interviewee – Carolyn Gramling**

Yes, well, so one of these benthic creatures that it turns out bioluminesces quite a lot has a very unusual way of doing it. It actually vomits these bioluminescent chemicals into the water around it, and that is how it exhibits this trait.

**Interviewer – Kerry Klein**

Wow! Well I am going to have to get myself out to the tropics to see these first-hand. Alright, so what else have we had on the news site this week?

**Interviewee – Carolyn Gramling**

Well, on *ScienceNOW* this week, you can find out about how scientists have helped deaf gerbils hear again using stem cells; how a Facebook message influenced the elections in 2010; and how a cliff-dwelling plant is using ants to help it reproduce. And also on our policy blog, *ScienceInsider*, you can learn all about the Golden Goose Awards, which are for researchers who pursue oddball topics that turn out to have actual health or economic benefits. And finally, next week on *ScienceLive*, you can chat with experts about whether eating less can actually make you live longer. You can check out all of this and of course a lot more on our Web site, [news.sciencemag.org](http://news.sciencemag.org).

**Interviewer – Kerry Klein**

Great. Thanks, Carolyn.

**Interviewee – Carolyn Gramling**

Thank you.

**Interviewer – Kerry Klein**

Carolyn Gramling is a news writer for *Science*. You can check out all of our news at [news.sciencemag.org](http://news.sciencemag.org), including daily stories from *ScienceNOW* and science policy from *ScienceInsider*. While you're there, be sure to check out *ScienceLive*, a live chat on the hottest science topics every Thursday at 3 p.m. U.S. Eastern time.