

Ask-a-Biologist Vol 016 (Guests: Cheryl Zook, Elizabeth Pennisi, Nancy Pelaez)

Dr. Biology Goes to Washington D.C. – Science for Everyone

Travel with Dr. Biology as he heads to Washington D.C. to interview three people who are all involved with science even though two of them are not scientists. Interviews include Cheryl Zook (independent film maker), Elizabeth Pennisi (science writer), and Nancy Pelaez (program director - NSF-NSDL).

Transcript

Dr. Biology: This is Ask-a-Biologist, a program about the living world, and I'm Dr. Biology. As you might be able to tell, we're out of the studio and off for another adventure.

[audio of aircraft pilot announcing flight info]

As you quite conveniently heard, the pilot just announced we're headed to Washington, DC, where I'm going to do some work at NSF, the National Science Foundation. While I'm there, I thought it would be fun to meet and talk with a few people that are very important to science and biology, but are not necessarily scientists. We're going to be talking with an independent filmmaker for National Geographic and the Discovery Channel; in addition, we get to meet with a science writer for the Journal of Science; and finally, we'll try to grab a moment with one of the program directors at NSF, to learn about a really cool program that is part of the National Science Foundation.

So sit back, relax, while we begin our trip by flying to Washington.

[more audio of pilot announcing departure, followed by the sound of the plane taking off]

We've arrived at Washington National Airport. We're heading to our first interview. To get to our first guest we'll be catching a subway out to Silver Spring, where the Discovery Communications headquarters are located.

[sound of a subway train in the distance - growing louder]

Well, from that loud rumbling you just heard, you probably figured out that the train has arrived, so let's get on board. Next stop, Silver Spring and the Discovery Corporation headquarters.

Well, I've been able to take the subway up to Silver Spring, and I'm standing outside of the Discovery Communications building. This is where, if you don't know it, the programs for the Discovery Channel originate, and I have been able to steal some time away from independent filmmaker Cheryl Zook and her latest project. Cheryl, thank you for joining us here today to talk about your filmmaking.

Cheryl Zook: It's a pleasure to be here.

Dr. Biology: Your work is a little different from what I'd say is the typical science and nature film. Your work deals with religious themes. How do you use science in your filmmaking?

Cheryl: Well, it's interesting. Most of the work that I do is based on, like you said, religious themes, but also cultural issues, rather than purely the science documentaries. Like, I don't do a lot of natural history filmmaking. I do more cultural- and religious-themed work. It's not quite the same kind of science-based study, like the study of biology.

In certain cases--the best example that I can give is, I did a film about the Gospel of Judas, when that was released a year or so ago. We actually had a lot of science in that, because one of the purposes behind this program was to try to authenticate whether or not we had the real thing, whether or not this was an ancient document, or if it was a forgery.

So we brought in a lot of science in that case. We had a radiocarbon dating pioneer from the University of Arizona who was helping us. We had ink analysis done on the document. We had epigraphers, or handwriting specialists, who worked with us to verify that the handwriting was authentic for that period.

So that was kind of a very unusual and exciting project for us, because there was so much science involved.

Dr. Biology: That's very interesting, and it's something I really wanted to know more about, because as we talk a little bit more in this program, there are many different kinds of people that bring different parts to the world of science. Not everybody is going to be practicing science. There are those who are going to have to communicate science, and use the things the sciences have found for the tools that they need to tell their own stories. So it sounds like that's pretty much what you're doing here.

Cheryl: You know, we're not scientists, ourselves, so we really rely on people in that field, the different specialties in the areas of science, to help us understand what it is that we're seeing, or what it is that we're looking at on TV when we're doing programs of this nature.

Dr. Biology: We have ventured beyond our usual practicing scientists today. The reason is to put a perspective that science and science communication needs many different types of people. As a filmmaker, you are one of these kinds of people. How does your role as a storyteller and documentary filmmaker fit within this realm of communication?

Cheryl: Well, like you said, our purpose in making films is to tell a story. We're not hard scientists, we're storytellers. We're not specialists in any given area, so we rely on scientists, we rely on historians, we rely on any number of people to give us the factual background of our stories, and it's a very important working relationship. We are able to present ideas in a more understandable way, but we need the specialists to help us understand the details behind the stories that we're presenting.

Dr. Biology: Were you ever going to be a scientist?

Cheryl: I can't say that that was my strong suit. I was an English major, so I dealt more with literature--fine arts rather than science itself.

Dr. Biology: Were you always going to be a filmmaker?

Cheryl: That was also a big surprise to me when I moved to DC. I didn't have a clear path that, "Yes, I'm going to be a filmmaker when I grow up." I studied theater. I worked more on the tech side of theater--I did lighting, I did stage management. Eventually, film became kind of a natural progression from that, where I wanted to do something that was a bit more accessible to the public. I felt like theater was sometimes more of an elitist kind of thing, and documentary film, I thought, was more educational and more accessible to the public. So it was kind of this long journey to get to filmmaking itself.

Dr. Biology: Along the way, you must have had some different jobs before you became an independent filmmaker.

Cheryl: Sure. I mean, I definitely started on the bottom. I was an intern. I did a lot of pushing paper when I first got into the business, and learned. I never studied film, I learned it on the job, and I've been very fortunate in that sense, that people gave me a chance to learn as I was working with them.

Dr. Biology: I have to say, your name, Cheryl Zook--rhymes with "book"--is a pretty cool name. It actually sounds like you were destined to be a filmmaker.

Cheryl: Well I have my parents to thank for that. I had very little to do with it. It's a good, solid sort of German-origin name, so....

Dr. Biology: If you weren't a filmmaker, what would you be?

Cheryl: Now that is a fine question. Honestly? When I was in college I thought I was going to be working in Central America doing literacy work. So it has been a process that has evolved considerably since then. But I think, for me, the kind of educational component of filmmaking has always been important to me.

Dr. Biology: You mentioned earlier that when you came to Washington, DC, you didn't plan on getting into filmmaking, but you stayed here. So what does Washington, DC, bring to your filmmaking?

Cheryl: DC is a great place to be, particularly for documentaries. National Geographic Channel is here, the Discovery Channel is based here. There are people all over the world who make documentaries, but this is a really great place in terms of the contacts you can make here, and it's a great city for documentaries.

Dr. Biology: But you also do an awful lot of traveling. Lots of these documentaries take you around the world. Can you tell me about some of those locations?

Cheryl: I have been very fortunate in where my projects have taken me. For some odd reason, I seem to have focused on the Middle East and Central Asia in recent years. I'm a freelance producer, so when I first started at National Geographic, I was on a project

about Afghanistan, and was fortunate enough to be able to travel there in 2004. It's one of the parts that I love most about my job, is I get to travel to amazing places and really meet amazing people.

Before I started working in film, I always had the travel bug, and I traveled a lot on my own; and I'm thrilled that I now get paid to do the same, to go and see amazing places and meet amazing people and be able to tell their stories.

Dr. Biology: Well you've answered my question. I was going to ask next, "Do you like to travel," and obviously you do.

Cheryl: Travel really rocks my world. It's always a thrill to me when I meet someone who completely changes my mind about something, or makes me see a different point of view, and there is nothing like being out in different cultures and having your world view challenged, that kind of keeps you motivated.

Dr. Biology: Having a different perspective is really important, not only in what you've been doing, but also in science. It is very common for us to have a differing opinion on what is the correct thing in science. There are different theories that come along, and it is really important to be able to look and listen to all the perspectives there are.

Cheryl: Yeah, and I think people get stagnant. If you're not challenged by new ideas--and I see this in the science world as well as in religion or in culture--you have to be challenged, you have to think about, why is it that we think about certain things the way we do, in order to continue growing and challenging ourselves. I think the best way is to be exposed to new opinions and new ideas.

Dr. Biology: So, you're a communicator and you also listen. I think that's the key, there. You've got to be able to listen as well as talk, right?

Cheryl: And I'd say I'm better at listening than I am at talking. I enjoy it more.

Dr. Biology: Yes, I have turned the tables just a bit for you, putting you behind the mic so you actually have to talk. Well, I want to thank you for joining us today. This has been really great, and I know that a lot of the students and people will find this interesting.

Cheryl: Thanks so much. I've enjoyed being here.

[squeaking and groaning mechanical sounds in the background]

Dr. Biology: Now earlier, when I said we were going to be stealing some time away from Cheryl Zook, we really were stealing some time. She was on a tight editing deadline, and she took some time away just to talk with us.

Next up? Well, you're hearing these strange sounds in the background. We're on a really long escalator ride, and it's taking us out of the Metro Center subway station, up to street level. There, we can walk about two blocks to the AAAS building. One thing you soon learn when visiting Washington, DC, is almost everything is reduced to letters and

numbers. AAAS stands for the American Association for the Advancement of Science. There, we can sit down with a science writer for the Journal of Science.

I'm on the 11th floor of the AAAS building, which houses the American Association for the Advancement of Science. I'm here with Elizabeth Pennisi, one of the writers for Science Magazine. Thanks for sitting down with us, Liz--can I call you Liz?

Elizabeth Pennisi: Sure.

Dr. Biology: Liz, as a science journalist you are very important to the scientific process, and what we're doing with this trip to Washington, DC, is talking about communicating science outside of the realm of the scientists themselves, because not everybody is going to be doing science, but a lot of us are going to be interested in what is being done.

What kind of role do you think you play in that realm?

Elizabeth: My job is to communicate science to everybody. I work for a magazine that is partly a journal, which means that part of the magazine is devoted to original research, written by the scientists, peer-reviewed by their peers.

The other half of the magazine is the part I'm involved in. We do a news section which has important events that have happened about science, for scientists, to scientists, in the course of the week, and then we write feature stories.

Our goal is to communicate science, new research, to the broadest audience possible. Of course, a lot of our readers are scientists themselves, but we also provide material for policy makers, for students, for teachers. My dentist gets it.

Dr. Biology: Were you always going to be a writer, or in that case, were you always going to be a science writer?

Elizabeth: I think, like a lot of people in my generation, I was going to be the new Jacques Cousteau. I wanted to be a marine biologist. I learned very early on that research wasn't my thing. I like to learn a little about a lot of things. I'm not so good at just focusing on one topic and getting a more and more detailed look at it. But being a science writer, I get to stay in science, I get to talk to scientists who are really excited about their work because they have just discovered something important enough for me to write about. So I get to experience all the thrills of research without having to do any of the work.

Dr. Biology: Do you get to travel when you're doing this?

Elizabeth: I travel to meetings. I sometimes travel to labs. So yeah, I do get to travel. I just came back from a meeting in France, and am headed out, hopefully, to Sweden at the end of the summer for another meeting.

Dr. Biology: Now, Science Magazine, you mentioned one part of it is a journal, which means that scientists write an article and it's actually published. Those are probably more

standard science, kind of in a techie realm. What role do you think your writing for Science Magazine fills in the overall scheme of science as a body of work?

Elizabeth: I think my role is to sort of help people keep up with fields that they don't really follow normally. So, for example, someone who is a developmental biologist might not be following the scientific literature on evolution, but they might be able to read a story that I have written on evolution to sort of catch up on the latest thinking about speciation, as an example. So that's my job, is to sort of help people keep in touch.

Dr. Biology: When you go out and you're doing an interview, how do you prepare for it? If you're going to do a story is there some process you go through?

Elizabeth: It depends on how much time I have before I do the interview. Ideally, what I like to do is read the home page of the person that I'm talking to, so I have an idea of what he or she has done recently. If I have a lot of time, I'll pull up some of their scientific publications and take a look at them. There have been moments, usually not on-the-scene interviews but for telephone interviews, where I barely know what the person is studying, and because of the time crunch I have to call up and say, "Tell me what you do."

Dr. Biology: Now you like to write, and one of the things I do with my scientists, I usually take their science away from them and ask them, what would they do if they couldn't be a scientist? In your case, you're a writer, and not just a science writer, you also do fiction. So I have to really take all the writing away from you, and now you have to let me know, what would you do if you couldn't write at all?

Elizabeth: I think I would be a kayak instructor. I spend almost all my free time canoeing.

Dr. Biology: Any particular kind of canoeing, because I have learned there are a lot of different kinds of canoes out there.

Elizabeth: I do a whole bunch of different kinds. So I do kayaking, whitewater kayaking, I do regular canoeing. I also do something called marathon canoeing, which is racing long distances--I did a 70-mile race, twice. I also do Hawaiian outrigger canoe racing.

Dr. Biology: That's fabulous. That's actually rather cool, and whitewater canoeing, that looks, actually, a bit scary sometimes to me.

Elizabeth: It can be very scary. I try not to do difficult rivers.

Dr. Biology: For young students out there, or even someone that has a career and they want to shift, they've always wanted to be a writer, what advice would you have for them?

Elizabeth: Read. I think it's really, really important for anybody who wants to be a writer of any type to read as much as they can, particularly in the kind of writing that they want to do. I think that's the first and foremost thing. You can take classes, that's always helpful.

A lot of scientists, especially young scientists, will ask me how I got into science writing, or what they can do, and what I suggest is, at the university, take a journalism course, try to get involved in the student newspaper or the alumni magazine, and write articles about science. Start off with the stuff you know and then move on from there.

Dr. Biology: Is it hard to break in? I mean, you didn't get here all at once. Was the path a little torturous or was it pretty easy?

Elizabeth: I would say it was torturous but not in the sense of hard, it was just twisty. I started out working at a university in a public relations office, writing for a science magazine put out by the university. I worked for United Press International for a little while, and moved to Washington for a job, and then moved to Science ten years ago.

Dr. Biology: You've been in Washington, DC, for quite some time, so what's it like to be living in Washington, DC, where there is so much science and art around, virtually free and very plentiful?

Elizabeth: It's wonderful. I think that something that is very appealing about Washington is the museums are free. The Smithsonian museums, at least, are free. So if you want to spend your lunch hour looking at art you can do that; if you want to spend your lunch hour under the elephant at the Natural History Museum, you can do that, and you don't have to feel guilty because you spent \$10 for one hour.

Dr. Biology: Well, Liz, I want to thank you again. It has been a pleasure to be able to come in and enjoy this beautiful building, and come up to the 11th floor and see your rather, well, I'd say spectacular office, but as a true writer, I see papers on the floor and books on the bookshelves. I have to believe you are really a working writer.

Elizabeth: Yeah, you see the dictionary on my desk, don't you?

Dr. Biology: That's even better. You're not stuck to the online dictionaries. You do a real, paper dictionary.

Elizabeth: Yes, I'm very old fashioned.

Dr. Biology: It was great to be able to catch up with Liz Pennisi and see what it's like to be a science writer. Right now I'm back in the subway and I'm waiting for the train to arrive. I have to say, getting around in Washington, DC, with the subway is a breeze. It makes it a great place to visit and learn about our history, science, and art.

Speaking of history, science and art, I want to mention an architectural and engineering detail that was used to construct the subways themselves. In the tunnels, if you look up, you'll see these arched concrete ceilings, and they have a pattern of recessed panels that

make a very nice design. But this is more than just a nice design. This is used to lighten the load of the ceiling--makes them less heavy without losing strength. These are called coffered ceilings, and they were developed by the early Greeks and Romans.

Right now it's time for us to head off to our final interview, at NSF.

I've been able to catch up with Nancy Palaez. She is actually a program officer at NSF. Earlier, I mentioned that a lot of the places in Washington are reduced to letters or acronyms. NSF stands for the National Science Foundation. So we're going to talk with Nancy for a little bit, and see what's going on at NSF.

Thanks for joining us.

Nancy Pelaez: Oh, it's wonderful to be here. I'm glad you're visiting us, and you're right about the acronyms. So one of the things I can do is tell you about the TLA Antidote. You know what the TLA is?

Dr. Biology: No I don't. Tell me about it.

Nancy: Three Letter Acronyms. [laughs] So much at the National Science Foundation is represented by acronyms that only the people who work here really understand, so with the TLA Antidote we teach people to go to the web page and look up the acronyms.

Dr. Biology: That's very cool. Actually, it's nice that they have come to grips with the fact that everything has been reduced to a bunch of letters.

One of the things that you're very interested in is another acronym. It's got four letters...

Nancy: It's an FLA.

[both laugh]

Dr. Biology: In this case, it's called NSDL, which is the National Science Digital Library. Can you tell us about it?

Nancy: Oh, that's a very cool collection of things that makes it possible for anybody to learn about recent science discoveries. There are videos and images, and activities you can do, all available to the public on the World Wide Web.

Dr. Biology: Now, how much money does NSF spend on these tools? Because these are really the cool things that should get kids interested in science.

Nancy: This year we're probably going to spend about six million dollars. You might wonder, well, where do we get six million dollars to spend on the National Science Digital Library? Well, that's your money. It is tax dollars that go to the federal government, and Congress then decides to give that money to us, to invest in this library, to make this material accessible to anybody.

Dr. Biology: So what are we getting with all this money, the six million dollars? It sounds like a lot of money to me.

Nancy: Well, this year there were 37 different groups who had plans for how to make science material available to the public, and they requested 25 million dollars worth of funds to invest in the tools that they are developing. So what we do is, we bring in panelists, and you are one of those panelists--thank you so much for coming and reading their proposals. These panelists then choose which of all these proposals is going to get money in order to make this material available to other people to use.

Dr. Biology: Have you liked Washington, DC?

Nancy: Washington, DC, is a wonderful place. I recommend everybody should try to plan a visit here at some point. There are tremendous museums and they are all free, and you can actually go right up to the Capitol Building and the Washington Monument. There are bike paths around here, so I went with some colleagues the other day and rode to Mount Vernon, which is the home that Washington built; and he actually was a scientist himself. He was quite a farmer, and he planted lots of fruit trees--cherry trees and peach trees--and so it makes you proud to see that here in the United States we have a long tradition of scientific investigation that goes back to our first President, George Washington.

Dr. Biology: That's really quite cool. Let me ask you: NSDL, let's talk a little bit more about that. One of the things I want to know is, how do you get there?

Nancy: Oh, on the Web it's just NSDL.org.

Dr. Biology: That's easy. With this collection of images and videos and content, I bet you have a few popular ones, or something that you really, really, really like.

Nancy: Well, my favorite is the Harvard-Smithsonian Digital Video Library.

Dr. Biology: Can you tell us about it?

Nancy: It's a collection of videos about how the planets work, or photosynthesis, or all sorts of things that people can learn; and there are also video clips of experts talking about interesting things to learn. To find that collection, there is a very long acronym. So if you think of the name Harvard-Smithsonian--Harvard is the university, Smithsonian is a museum here in Washington, DC--Digital Video Library, the acronym is HSVDL.org. Go to that web site, then you have all sorts of video clips about different topics in science that you can look at and learn from.

Dr. Biology: Can teachers get involved with the NSDL, even if they happen to be in a classroom? Is there something they can do to get involved?

Nancy: Yeah, anybody can join the NSDL right now, and they have a newsletter. If you give them your email, they'll send you information. If you have created your own material, maybe taking photos--here's one of my favorite projects, is find your favorite place out in nature, go out there once a month with the camera, make sure the camera is

always pointing in the same direction, record the date and take photographs of the same place over time. The seasons go by and we hardly notice how things change as time passes, but if you take a photograph every month and then put those all together, you can see how things change in the 12 months.

Now, if you would have a collection like that, you can submit it to the National Science Digital Library so that other people can enjoy seeing how seasons change; and that gives you the chance to maybe compare what's going on in California to how it happens in Washington, DC, or someplace else in the world.

Dr. Biology: In Arizona, where you might not see as much of a change, versus DC, where you're going to see an awful lot of change because they have, truly, four seasons. Well that's really a marvelous idea. I like it. I like it a lot. I think I'll do it.

Nancy: Good.

Dr. Biology: Now, if you weren't a scientist--I always like to ask this, because some of the time I find more about my scientists this way than some of the other questions we ask, or any of the questions I ask--if I took that away from you, you couldn't be a scientist or a biologist, what would you be?

Nancy: Probably an artist.

Dr. Biology: What kind of art?

Nancy: I would probably be doing video or something like that. Some kind of high-tech maybe video games or something like that.

Dr. Biology: Do you see some new technologies coming on the horizon that you think teachers and students are going to be wanting to check out?

Nancy: I think one of the most interesting things is called "tagging." So if you find something in the NSDL these days, you can actually bookmark it with a tag that you can then access from school, or from home, or from a public library, wherever you happen to be.

So one of these tools is called del.icio.us and that's something, if you Google del.icio.us you'll find the web site that teaches you how to tag your favorite items that you might find in the National Science Digital Library or wherever else you're exploring on the Web.

You can also find communities of people who like the same kinds of things you like on del.icio.us, and then if you like, for example, the Harvard-Smithsonian Digital Video Library, you can look at people who like stuff like that and see what they're looking at, and then that helps you find the types of things that might interest you.

Dr. Biology: How about those that, they like science, but maybe they don't want to be in the lab, but they want to be involved. What kind of careers are there for those people?

Nancy: Most of the science communicators have a lot of training in science. As a matter of fact, my niece got a chemistry degree, and then went on and she completed her doctorate, and everybody expected her to be working in a lab for the rest of her life. Well, she just got a job at Nature Magazine, to be writing about current discoveries that might be of interest to readers of Nature Magazine. And as part of her training, they sent her to London, to have a year abroad, to see what kinds of discoveries are being made by European scientists.

Dr. Biology: It seems like travel is a common theme in the sciences. It's not unusual for scientists, of course, to go out in the field. Travel, as we've heard in previous shows, Andrew Smith has gone to the Tibetan Plateau. We have others that send their experiments up on the Space Shuttle. I bet you have some trips planned as well.

Nancy: Yes. So, I'll be going, in the summer of 2009, to Kyoto, Japan. My task there is to look at the International Union of Physiological Sciences, and talk to the international physiologists about how they are investigating and educating for physiology in other countries.

Dr. Biology: I want to thank you again, Nancy Pelaez. You've been really wonderful. I really appreciate your time. It's a busy place, but you were able to sit down with us, and I hope we get to talk to you again, maybe after your trip, or I hope even sooner.

Nancy: Thank you very much.

[music in the background with people talking]

Dr. Biology: That about does it for this show. As you can tell, you don't need to be a scientist to be involved with science. We have been able to sit down with an independent filmmaker, we were able to learn what it's like to be a science writer, and we had a chance to catch up with a program director at NSF who is part of a really cool program called NSDL, the National Science Digital Library. All three of them were using science in one way or another, but they weren't all scientists.

Then, while walking back to the subway, what did I come across? Well, you hear it in the background. It's a free live music concert, being held in the garden off the Mall. So I'm sitting down on the grass, listening to some great music--jazz music.

What are we talking about? Music that was brought about through experimentation. These are the kinds of things we do in everyday life. We are scientists, whether we know it or not. We're usually experimenting, or we're using the scientific method in one way or another. We're making decisions, that's the important thing. Right now? I think I'm going to lie back on the soft, green grass and listen to some of the music, and the next time I catch up with you we'll be back on the campus of Arizona State University, where this show usually originates.

If you have questions about the show, or biology in general, you can use our companion web site, which is askabiologist.asu.edu, or you can Google the words "Ask-a-Biologist." I'm Dr. Biology.