

THE SOUND OF SCIENCE

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“This was a humane, witty and spellbinding entry, well deserving of the top spot. The writing is spare and straightforward, which rendered the interaction between a sickly, aged, mucus-coated alien and an overworked Diamond researcher strangely credible. There is an art to conveying just the right amount of information in a science-themed piece of fiction– not so little that the reader is lost, but not so much that the reader feels forced and unable to use her imagination. This writer has got the balancing act about right.”

The Sound of Science

"And from here you can see the true size of the synchrotron," I say, pointing along the arc of the experimental hall. This part of the tour never fails to impress people, and I'm always a bit awed myself. "The x-rays that come off that ring are a billion times brighter than the sun and we use them to—"

"Excuse me."

I look at my tour group to see who has spoken, and find the Slug staring back at me with its three sets of protruding eyes. The rest of the tour, a middle school class from Oxford, is standing a discreet few feet away, which isn't surprising. The aliens have a peculiar odor; petrol and over-cooked fish are the kindest descriptions I've heard. Plus, they leave a trail of mucus wherever they go.

The term 'Slug' isn't the nicest name for our alien visitors, but it fits. The alien's lumpy, mucus-coated body sits in unpleasant contrast to the clean lines of the experimental hall. It stands on a Segway, and two tentacles grasp the handles in a parody of human hands. A viscous puddle has formed on the footstand.

"Do you study nucleic acid?" it says, its voice coming from somewhere under the eyestalks. "Here at Diamond Light Source?"

"Yes, we do. We have several structural biology beamlines, where we use x-ray diffraction to get the atomic structure of both proteins and nucleic acids—"

"What about three-strand DNA?"

I try to suppress my irritation. I'm doing this tour as a favour to a colleague, who is away at a conference. I should really be preparing for my own conference, plus I've got two papers that need editing and a fast-approaching grant deadline. Certainly the aliens already know everything they need to know about their three-stranded DNA.

"We haven't used these beamlines to study three-stranded DNA or its associated proteins," I say. "Your proteins are difficult to isolate and impossible to grow up in our usual cell lines. But surely you know that."

"Triple is best," the alien says. "Far superior to double DNA. Triple interactions and a hundred times the amino acids."

"A hundred more things that can go wrong," I say. "A hundred times the difficulty in replication and expression and repair of DNA."

The Slug ignores me and goes on about the superiority of three-stranded DNA. I try to arrange my face in a semblance of patience. They are to be treated as honored guests, after all. But it's hard to imagine that the synchrotron offers any technology they haven't already developed themselves, with their light-speed ships and translator nanobots that allow them to talk in any human language. Why they are visiting earth at all is a mystery to me. Yet here they are, touring castles and historic villages, museums and zoos. And synchrotrons, like the Diamond Light Source.

Finally, the alien winds down. The cilia on its torso twitch, and its eyestalks undulate restlessly.

I want to argue. I want to ask why they feel the need to come here and tell us they are better than us. But instead, I go on with the tour. "All these beamlines are housed in the same building. " I lift a hand to indicate the huge span of the hall, the circular wall that goes off into the distance. "And this makes for great acoustics. Let's just stop and listen for a moment."

From where we stand, we can hear the hum of computers, the swish and click of pumps and electronics, and underneath it all, the rise and fall of conversations from the scientists and engineers who work the floor. "Hear that?" I say. "It's the sound of discovery." This always gets them.

"You have all these techniques," the alien voice grates from behind me. "Why are you not studying triple DNA?"

I turn. I know I should do my best and just answer the question. I really do know that.

"We are not studying triple DNA here. I am not studying it because I do not have grant money to study it. And you know why? Because it would take years to figure out how to make our cell lines incorporate your superior triple DNA and produce your superior proteins. And years to figure out how to crystallize it. And I don't see any of you arrogant triple DNA slugs offering to help!"

I realize suddenly that everyone is staring at me. Two middle-schoolers who were previously fighting over a notebook have stopped to gape at my outburst. The adult chaperones look disapproving.

The alien doesn't respond, and if three pairs of eyes on stalks can manage to look hurt, somehow they do.

I represent science, I remind myself. I represent all scientists at the Diamond Light Source.

"Ah, sorry," I say. "Let's move on, shall we?"

The alien is quiet after that. It tags along behind the rest of the tour. I feel reproach in the whirl of the Segway wheels against the polished floor. I almost wish it would start talking about its DNA again.

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Three days later I am sitting in the atrium enjoying a moment of quiet and a cup of coffee when I suddenly smell petrol.

I look up to see an alien approaching me on a Segway. They all look alike to me, but I have a feeling this is the same one that was on my tour. It confirms my suspicion when it says, "I understand that slugs are considered disgusting by your people."

"It was unkind to call you a slug," I say. "I'm sorry."

Its eyestalks make circular patterns in the air, a sign of embarrassment. I know that now because I've been doing some reading about the aliens.

It's a beautiful day, with sunlight streaming through the high windows to light the atrium in soft whites. The alien's skin gleams wetly in the light. I wonder if it hates the dry air here.

"I enjoyed your tour," it says.

"Thank you."

"I understand I interrupt too much."

"That's okay."

I sip my coffee, wondering how I can get out of the conversation. The grant application awaits. And one of the beamlines is down because of a problem with an ion pump. I have to reschedule a whole week of users.

"I'm curious," I say. "Why have you traveled all those light years to see the museums of earth? How could they possibly be that interesting to you?"

"What we have not seen is interesting. What we have seen seems ordinary."

"Very profound." I immediately regret my sarcasm, but to my surprise the alien wiggles the fringes of cilia circling its eyestalks: its own form of laughter.

In spite of myself, I smile.

"And to reach for knowledge outside oneself -- that is extraordinary."

That's something my father would have said. He was always reading about new technology and new science. He loved tours. He would have loved to meet the aliens. He would have followed them around, peppering them with questions.

I wait, but the alien doesn't say more. Perhaps it is feeling awkward. Maybe it doesn't know what to say to me, either.

"Listen," I say. "I'm heading down to troubleshoot one of the beamlines. Do you want to come along?"

"Yes, please."

I walk next to the alien, the wheels of its Segway squeaking a little, and I badge us through onto the experimental floor. I've been studying pictures of our visitors, and I

think I can now distinguish some of the machines it carries. The recording devices are slight bumps under its skin, embedded at regular intervals along its torso. Its breathing apparatus is a series of translucent veils that cover its skin in patches, fluttering up as we move along. I know they wear a thin film of material to keep their skin moist. Maybe on their home world they don't leak mucus all the time.

"How do you travel on your home world?" I say. "Surely you don't have Segways?"

"Where we live is much like one of your swamps. We half-swim, I think you would say."

We stop at the broken beamline, and I lead the alien back along the beampipe to a cluster of pumps and racks of electronics. It has to abandon its Segway along the way, and I try not to look at the trail its footpad leaves on the floor. I'll have to apologize to the cleaning staff later.

Now that I'm here, I'm wishing I hadn't invited the alien down. I'll tell it a little more about the beamline, then try to politely suggest it go tour something else. Maybe I can palm it off on one of my colleagues in the molecular biology lab.

"Here," the alien says. It extends a gray tentacle to one of the bellows connecting one section of pipe to an optics tank.

"Here what?" I say.

"A small leak. I plug it." It retrieves its arm back into its torso. A glistening pellet covers the place on the bellows that it touched. I look at the ion gauge, see that the pressure has started to drop. So the pump wasn't broken after all.

"How did you know there was a leak there?" I say.

"We have very sensitive recording equipment. We record not just sight and sound, but pressure and smell and other characteristics of the environment."

"But how does it work?"

"I cannot say," it says.

"Of course."

Maybe I haven't kept the disappointment out of my voice, because its eye stalks start to wave, and it says, "I do not mean to be disrespectful. Let me ask. Do you have an automobile?"

"Yes."

"Do you understand its operation?"

"Well, basically. It uses gasoline to fire pistons, which then, er, well, turn something, a crank of some sort... in the engine." I stare back at the alien for a moment.

"I see your point."

"I am not the inventor of these sensing devices, or of the ships we travel in."

"Okay. But surely some of you understand the technology."

"It was given to us."

"Was it another race that gave you the technology?" I say. I imagine a universe filled with omniscient alien races, the vast knowledge they must possess. Maybe they've even unraveled the secrets of the birth of the universe itself—

"No," the alien says.

"No?"

"My people invented the ships, and the rest of our technology. But only some know how to build and maintain and fix."

"Only some of you, as in, not any of you that have come here?" I think I'm beginning to understand what the aliens are doing here.

"We wanted to travel, to see the universe. Like you travel in a car. We travel in a ship."

I study the alien for a moment, wondering exactly how much recording equipment it wears. "You're tourists," I say.

"Yes. We contribute for many years for the betterment of our race. Now we are free to travel and explore."

"You're retired tourists."

"Yes."

"That explains a lot," I say.

"Many wish to see what they haven't seen before. And many hope to find cures for all that kills us."

"Well, many of us hope that, too. That's what the work here is all about."

"No, you don't understand. We are retired because we are sick."

I study the alien some more.

"Only the sick are free to travel," it says.

"So sick that you can't work?"

"So sick that we will die soon, and we would like to spend the last of our days touring."

"But you must have ways to study your physiology. You must have the equivalent of synchrotrons on your home planet, and medicines and technology--" I trail off. To

someone who lived a hundred years ago on earth, the technology today would seem miraculous. Yet we still have not cured cancer, or a myriad of other diseases.

"A hundred times the things that can go wrong," the alien says. Its eyes move up and down, a smile. "As you say."

They are advanced in metallurgy and mechanics. Not advanced enough in biology of themselves. Not unlike us.

"All creatures die," I say.

"Just so."

Its breathing veils move up and down in the air currents, and every now and then tiny rainbows shimmer to life on the surfaces. I hadn't noticed that before.

My father died of lung cancer just five years ago, right before the aliens arrived. I would love to find a cure for cancer, too.

I start to think about ways that we could grow up cells that would incorporate triple-stranded DNA. It would take a lot of work. There are no preliminary experiments to put into the grant application. Yet their physiological building blocks are amino acids and nucleic acids. They harness oxygen for energy. They have cells and organs and circulatory systems and eyeballs. In some ways, they really aren't so different from us.

"Maybe I can look into that triple DNA system of yours," I say. It's too late for these aliens, the current visitors. But we could help the ones that come next. Maybe the next group of tourists will include some scientists, who can help us with our research. And studying their nucleic makeup would certainly tell us something about our own. Maybe reaching outside ourselves is exactly what we need to do. Maybe that's the extraordinary that science is all about.