SOMETHING FISHY

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Last week, a journalist from national TV contacted me.

“Have you heard about the Canadian lottery?” she asked.

“No,” I said, “what about it?”

“Their latest draw resulted in six consecutive numbers,” she told me.

“And?” I said, knowing full well where this was headed.

“There has been a torrent of reactions about it on social media,” she said, “from jokes to outright accusations of fraud. So, we were hoping you’d be willing to comment in it on our show.”

“Perhaps,” I said, “when do you need me there?” I doubted they need a statistics professor to explain it, but our dean always insists that we should participate in outreach. Accepting this interview offered me an easy way to tick that box, so I agreed to come to the studio on Monday.

Over the past decades, they’ve asked me to comment on many allegedly remarkable coincidences. The essence of my explanation has always been the same: in lotteries, all the outcomes are equally unlikely, whether we perceive a pattern in them or not. But I got bored with telling the same story, so when the call ended, I started investigating this case, looking for a fresh angle.

Apparently, the Canadian lottery had switched to an electronic system for performing their draws, as have many other countries, including South Korea, Romania, and some states in the US. I hadn’t been aware of that, even though I used to do research on methods for producing randomness. Then vanity struck me: was it possible that they had built on my early work?

It was difficult to get my hands on specifics about their system. The company that had successfully developed and sold their random number generator to various national lotteries was called ML Systems. They had a video on their website that illustrated the system with a 3D animation of cardboard boxes with printed buzzwords. It was all very ‘reliable,’ ‘traceable,’ ‘unhackable,’ and of course ‘provably random.’ But how it worked? Not a clue about that.

I decided to check whether ML Systems had filed any patents and, sure enough, they had one from four years ago. That was shortly before they’d

started selling electronic lottery systems worldwide. The patent described "a low-cost method for harvesting biological randomness." For a moment, I thought they used the radioactive decay of potassium in bananas, but the design contained no Geiger-Müller tube.

The patent file did mention an electronic detector. Still, it would have been easy to miss that this referred to a microelectrode to measure the signal from a lamprey's retina. Not for me, though, as I remember the Latin name of the species all too well: *Mordacia lapicida*. It was even in their name: ML Systems. At this point in my literature research, I said under my breath: "Oh no, they haven't!"

I tried to fathom what had gone on in the research lab of ML Systems. They must have succeeded in isolating rod cells from lampreys' retinas, hooking them up to tiny electrodes, and packaging them into a serialized product. And they even managed to convince several state lotteries to buy these random number generators built from fisheye cells.

Did they go to Chile and ask local fishers for the parasitic fish, or did they order them through Alibaba? How did they manage to harvest the cells from their tiny eyes? And where did they gather the expertise to connect the single rod cells to microelectrodes? I had no answers to any of my questions. All I knew is that they indeed achieved what I once proposed in an obscure proceedings article published during my doctoral studies in the early nineties. Rod cells had been all the rage during my studies after they had been found to be sensitive to single photons.

I was stoked that someone had finally built an application based on my research – stoked and full of questions. The answers would be great to have before my interview. So, I called ML's sales representative, the only number I could find online. The salesman sounded inexperienced and couldn't help me with any of my questions. So, in the end, I asked him: "Have you even seen one of the random number generators you're supposed to sell?"

"Well, sure," he said, "I have one on my desk right here. I feed it every day."

"Feed it," I repeated, "do you mean power it?"

"I feed the host," he said, "the lamprey is attached to another fish, so I feed that one every day. All our customers do so; it's in the instruction manual. The first year's supply of fish food is included in our catalogue price."

I was shocked and didn't have the heart to tell him that my research had been on the statistical distribution of the noise signal produced by single cells when kept in the dark.

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Of course, I do feel guilty. After all, I did include a procedure for transforming lampreys' retinal noise to near-uniform distributions over a discrete interval of choice. I even mentioned the possible application to lotteries in the abstract! But a fool could see that my proposal was not to be taken seriously. After all, the results could easily be manipulated. Rod cells are highly sensitive to light, remember, so if anyone wanted to manipulate such a lottery, all they would need was the dimmest of flashlights.

There's no way I'll be able to sit through my TV interview with a straight face now, is there? If the interviewer opens with "unlikely things do happen," I will have a laughing fit as I think of the parasitic fish sitting on that guy's desk. No, I'll have to call in sick with the producer. Then, I'll reach out to the lottery people again and tell them discreetly about their tiny problem. I just can't believe they didn't notice my study was published on April fools.

ABOUT THE AUTHOR

Sylvia Wenmackers is a professor in philosophy of science at KU Leuven, Belgium. Most of her research is related to the foundations of chance. Besides academic papers, she writes a monthly column for a popular science magazine. She has published two nonfiction trade books, and her speculative fiction has appeared in *Nature Futures and Danse Macabre*.