

Crystor

Ray Branchaird was an unusual man. A gifted physicist, his early career followed a traditional pattern. Studies at several prestigious universities, a PhD in Physics, appointment as an Assistant Professor, and a schedule that juggled research with teaching classes. He quickly learned three things about himself:

1. Although he loved physics, he loved many other things as well. Any attempt to become one of the world's leading physicists would require him to devote his life to physics and abandon, or at least curtail, the time he spent on other interests. He didn't want to do that, and he especially didn't want to spend less time with his new wife and the family they were planning.
2. He didn't particularly enjoy research. It was fun at first, when everything he was learning was new, but as his research progressed he felt he was learning more and more about less and less. And while he realized that research was useless if you didn't share your findings with others, he didn't like the formal writing that was required in the "publish or perish" world of academia.
3. He loved teaching. It was exciting to share his enthusiasm for physics with students, and it was exhilarating to watch them grasp the ideas he was presenting. Physics explained how the world worked, and indeed how the entire universe worked, and it was a joy to share this knowledge with others. He could feel the excitement in a small classroom. Large lecture halls, like the ones he was routinely expected to teach in, were stifling.

After coming to these conclusions, Ray realized the traditional academic career was not the right path for him. He resigned his position at the university, moved to a small town where he could afford to live on a smaller salary, and taught physics at a local community college. There he could share his love of physics with small groups of students and still have time to spend on other interests. He may not have been pushing back the frontiers of knowledge himself, but several of his students went on to excel in a variety of sciences.

Ray had an old-fashioned mantle clock in his study. He thought his great-grandfather had bought it new, but he wasn't certain. All he knew was that it had been passed down through his family for generations and it always kept good time. He wound it every Sunday night, and it reliably chimed the hours and the half hour for the rest of the week. A deep "bong" counted the hours and a cheery "ding" announced the half-hours. But one day it began misbehaving.

Ray didn't know exactly when the erratic behavior started because it only seemed to occur in the afternoon, and he was usually at school then. He was home on the weekends, though, and that's when he noticed that between 3 pm and 3:30, the clock seemingly chimed at random. It would bong three times at the top of the hour, as expected, but then after a period of silence it began bonging and dinging for no discernable reason. There might be a single bong, or maybe a double bong, followed by a brief pause. Then maybe a ding, or a ding-bong, or a ding-bong-ding-ding, or some other combination before

another brief pause. This behavior would continue for maybe two or three minutes, and then the chiming would stop and the clock would behave normally. Until the next afternoon.

The first thing Ray did was disassemble the clock. He had taken watches apart as a kid, to see how they worked, so he had no qualms about disassembling the much larger workings of a clock. There didn't seem to be anything unusual. He carefully examined the wheels and levers that activated the chimes, and everything seemed to be in order. He could see what triggered the clock to chime on the hour, and a wheel with notches in it that controlled how many times it chimed. A single notch caused it to chime once at one o'clock. The next time it was triggered, two notches caused it to chime twice, and so on until there were twelve notches to announce twelve o'clock. Then it was back to the single notch. A similar mechanism controlled a smaller chime, which "dinged" once at thirty minutes after each hour. He cleaned all the parts, reassembled the clock, and everything worked as expected. He could turn the hands of the clock to trigger the chimes, and there were no surprises. No unexpected chimes between 3:00 and 3:30.

Next he rigged up a jig to let the clock motor run on his workbench. He mounted a video cam so it monitored the chime mechanism twenty-four hours a day. The video showed that the chime mechanism – the wheels and notches that controlled the chimes – worked perfectly. Miraculously, though, the little "hammers" that struck the chimes would rise and fall for no apparent reason between 3:00 and 3:30 every afternoon. As far as Ray could tell, there was nothing in the clock mechanism that was causing the hammers to move. It was as though they were controlled by an unseen force.

At this point Ray decided it was time to consult an expert. He took the clock to a repair shop. The repairman, a wizened little man with thick glasses and a green eyeshade, listened carefully while Ray explained the problem. Ray could tell by his expression that the repairman didn't believe Ray knew what he was talking about. He said something about dirt buildup in the notches causing clocks to skip ahead and chime two or three hours at once, despite the fact that Ray told him he'd cleaned the clock and the notched wheel didn't move during the uncontrolled chiming.

Two days later the repair shop called and said Ray could pick up the clock.

"This is a very unusual clock," the repairman said when Ray got to the shop. "It was made by a Swiss company in the late 1890s. It has bronze gears instead of the usual brass ones, and jeweled bearings. They were trying to make a clock that would last forever. It's a very good clock, but it cost more than a standard clock. Standard clocks lasted longer than most people lived anyway, so very few people wanted to pay more for this clock. They only made them for a couple of years. I've read about them before, but this is the first time I've ever seen one."

"What about the chiming?" Ray asked.

"Beats me," the repairman said. "It chimes when it's supposed to, but I don't know why it throws in those extra chimes. The jeweled bearings are special, though. They were common in watches because watches have such a small mainspring they had to reduce the friction, but they're very unusual on a clock like this."

Ray thanked him and took back the clock. He realized that, jeweled bearings or not, it was going to be up to him to figure out the chimes.

His next step was to set up his video cam to record the clock 24/7 to see if he could find a pattern to the extra chimes. After several months, he came to the following conclusions.

1. The “rogue chiming” lasted one minute and twenty-seven seconds each day.
2. Each day the “rogue chiming” began thirteen seconds later than the previous day.
3. There seemed to be short pauses and long pauses between groups of “rogue” chimes.
4. There were almost always one, two, three, or four chimes between each pause. The chimes between the pauses seemed to be a random mixture of “dings” and “bongs.”
5. The exception to rule 4 was that once in a while there would be six chimes between pauses. These six chimes always followed the pattern “ding-bong-ding-bong-ding-bong.”
6. There were almost always three, four, six, or eight short pauses between each long pause.
7. There were two exceptions to rule 6. One was that there was a long pause before and after the six chimes that were the exception to rule 4, with no short pauses. There were also a few occurrences of a single short pause between two long pauses. Those occurrences always followed the pattern: long pause – “ding-bong” – short pause – “ding-bong-ding” – long pause.

While he felt these observations were important, he still didn’t know why his clock went on these “rogue” chiming sprees, and what (if anything) the chimes meant. He tried using numbers to express the sequences, using a “1” for a ding, a “2” for a bong, a “0” for a short pause, and “00” for a long pause. This seemed to be an effective shorthand, but no patterns were immediately obvious to Ray. Having numerical expressions, though, meant he could use pattern recognition software to analyze the data.

His initial attempts to use software disclosed no pattern. That didn’t surprise him, as he expected he would have to try several different approaches with multiple programs. What did surprise him was that there was no rogue chiming that day. Or the next. Or the day after that. Whatever had been causing the strange behavior of his clock seemed to have gone away.

To a practical man, the fact that the clock was no longer misbehaving would have meant “problem solved.” Ray was not a practical man. A practical man never would have abandoned the safe, well-paying world of academic research to look for personal fulfillment at a community college. To him, the fact that the rogue chimes stopped was just another piece of the puzzle. It was a worrisome piece, too, because it meant there would be no new data. He’d have to solve the mystery with the data he had.

In his initial search for patterns, Ray had looked at each day's chimes as a unit. Those units never repeated, and there didn't seem to be any rhyme or reason to them. The fact that the exceptions to Rule 6 occurred with a specific sequence of chimes between pauses, and those sequences occurred more than once, made him wonder. Were the long pauses some sort of divider? Instead of looking for repetition or patterns comparing one day's chimes to the next, he looked for repetition or patterns in the chimes between each long pause. He found several repetitions of the chime sequence between these pauses, and every time he found a repetition the chime sequence after that repetition also repeated. Or at least it started to. The fact that the clock only chimed for a few minutes each day meant he was lucky if he got one complete long sequence during a day's chiming. That made him wonder if each day's chimes were an incomplete fragment of a longer sequence. The longer sequence repeated, but each day only sounded a one minute and twenty-seven second piece of it.

It didn't take Ray long to piece together a series of chimes and pauses that formed a "master" sequence. Each day's chimes were a subset of that master. He still didn't know what it meant, if indeed it meant anything. He also didn't know why his clock chimed that sequence when there was no physical reason that he or the clock repairman could find that would cause it to chime at all, but it felt like this was a major breakthrough.

Ray spent hours staring at the master sequence. The exception to Rule 4, the "12121212" (ding-bong-ding-bong-ding-bong) sequence occurred twice in the master sequence. The "120121" (ding-bong, pause, ding-bong-ding) exception to rule 6 occurred once. Many of the sequences between the short pauses occurred only once. Some occurred twice, and one occurred four times. None of this seemed to make any sense.

Ray was still pondering this problem while he took his shower the next morning. For some reason the "120121" sequence seemed familiar. Not the numbers, the actual sound. "Ding-bong, pause, ding-bong-ding." Suddenly he remembered where he had heard that sequence. When he was a kid, he was interested in amateur radio. He had to learn Morse code to get his license, and for a long time he could only afford a Morse code transmitter. He didn't remember much of the code, but every message he sent ended with "AR," a shortcut that meant "End of Message." AR was "dot-dash, pause, dot-dash-dot." Short pauses separated letters, long pauses separated words.

He rushed out of the shower, threw on a bathrobe, and ran downstairs to his study to see if he could translate the message using Morse code. When he finished, he let out a low whistle.

Bob Blosser was a chemistry teacher at the community college and a good friend of Ray. They both carried their lunches to work and often ate together in the faculty lounge. Bob was a little surprised when Ray asked him to join him in his office for lunch, but he figured Ray must have a good reason. Ray's office was tiny, but he had cleared off a worktable to make space. When they had both spread out their lunch baggies and started eating their sandwiches, Ray explained why he wanted to eat in the office.

“Remember my telling you about the strange behavior of my clock?” Ray asked. When Bob nodded he continued. “I think I’ve finally figured out what happened, but it sounds crazy. I wanted to talk to you in private to get your take on it.”

“You’ve got me curious,” Bob said. “I’m all ears.”

“Did you ever read Sherlock Holmes stories?” Ray asked.

“A few,” Bob said hesitantly. “I’m not really an expert.”

“In *The Sign of the Four* Sherlock said, ‘when you have eliminated the impossible, whatever remains, however improbable, must be the truth.’ I think I’ve looked at every possible explanation of why my clock chimed at odd times, and there is no mechanism or force that I know of that could have sounded those chimes.”

“And that leaves . . .?” Bob asked.

“A force that I don’t know of. Which, since I try to keep current on theoretical physics, probably means a force that’s beyond our current understanding of the universe. Maybe something along the lines of quantum entanglement, but on a macro scale. And something that doesn’t require prior pairing.”

“OK, that’s a little weird, but it sounds like a complicated way to say you still don’t know why your clock is chiming.”

“It would be if it was chiming at random, but I’ve discovered a pattern to the chimes.” Ray explained his efforts to find a pattern to the chimes, and then he put a piece of paper in front of Bob with the full translation of the Morse code message:

Hello Earth. Greetings from Crystor. [EOM]

“Surely this is some kind of a joke,” Bob said.

“I’m not joking,” Ray said, “and I don’t see how anyone could be playing a joke on me. I watched the hammers in the clock strike the chimes for no apparent reason. Nothing in the clock was moving them. There was no wind blowing on them. If something was exerting a magnetic force strong enough to move the hammers it would have moved the loose nuts and washers lying beside the clock. As I said, no mechanism or force that I know of could have moved those hammers. But they moved.”

“Where is Crystor?” Bob asked.

“No idea,” Ray answered. “But of course, if there was intelligent life anywhere in the universe, we wouldn’t know what they called the planet they lived on.”

“How did they know we call our planet ‘Earth’”

“They’ve been monitoring our transmissions. Ever hear of SETI? The Search for Extraterrestrial Intelligence?” We’ve been searching for electromagnetic transmissions from other planets for decades. There’s no reason to assume other intelligent beings aren’t doing the same thing.”

“But if they’ve been monitoring our transmissions, why would they reply in Morse code? And why send their reply to your clock?”

“It takes time for radio waves to travel through space.” Ray explained. “They travel at the speed of light, but if Crystor is, say, a hundred light years away they would only now be receiving our earliest voice transmissions. But we sent Morse code over the airwaves, ‘wireless’ as it was known back then, for many years before we started using radio for voice. So, they would have heard our Morse Code long before they heard anything else. I’m sure they weren’t trying to reply to my clock. I think it was just an accident that my clock responded to whatever signal they sent. They probably have some advanced form of communication which they used in the hopes that we would have developed something similar to receive it.”

“But if they received our Morse code radio waves, why wouldn’t they use radio to reply?”

“Maybe they have,” Ray speculated. “But if Crystor is a hundred light years away, we won’t receive their radio reply for another hundred years. Quantum entanglement travels faster than light. So, and I’m speculating here, if whatever signal is affecting my clock is *similar* to quantum entanglement, they may use that for long range communications because it’s faster.”

“Wouldn’t it affect every clock on earth?”

“Not necessarily. The clock repairman said my clock was very unusual. He said they were trying to make a clock that would last forever so they used bronze gears and jeweled bearings. Maybe, and I’m just guessing here, maybe they used some special long-lasting alloy for the chime hammers, and that alloy just happens to respond to their signal. I don’t pretend to have all the answers. I just know that *something* beyond my comprehension is affecting my clock, and the chimes appear to be a message from another planet.”

Bob thought about this for a long time. “You said you just receive fragments of the longer message once every day. Is that because something in you clock has to be aligned with the other planet?”

“That would be my guess,” Ray said.

“And it shifts a little each day because. . .?”

“The earth is rotating around the sun. The time of perfect alignment would shift a little each day.”

Bob thought for a while longer. Finally he spoke. "I don't like your explanation because it sounds like something I'd see in one of those daily astonisher magazines at the supermarket checkout, but I can't think of anything better. I've always said I didn't think we were the only intelligent life form in the universe. I guess I didn't really believe that because I'm having trouble accepting the idea that you have a communication from another planet."

"It took me a long time to accept it myself," Ray said. "But I feel like I've eliminated every other possibility, so what remains must be true. The question now is, what do I do about it?"

"That's a real poser," Bob said. "I know you. I know you're a great physicist and you wouldn't lie, but I'm having a hard time accepting this. People who don't know you will dismiss it out of hand. They'll see you as some nutty professor at a small community college who thinks aliens are talking to his clock. What proof do you have?"

"Nothing definitive," Ray admitted. "I have all the raw data – videos of the clock chiming, videos showing the chime hammers moving on their own, my calculations to decode the message – but those could all be faked. Now that the clock has stopped chiming, there's no way anyone could replicate my observations."

"So announcing your findings would just expose you to ridicule," Bob suggested.

"Probably, but on the other hand, what right do I have to keep this to myself? People have been searching for signs of life on other planets for hundreds of years. Governments and private foundations have spent millions on SETI trying to detect extraterrestrial life. Whatever life form exists on Crystor is trying to contact us. And I'm supposed to just keep quiet about it because I'm afraid of being laughed at?"

In the end, Ray decided to contact SETI. They were skeptical, as he was not the first person to call them and claim to have communicated with extraterrestrials, but it was scientific skepticism. They were open to the idea that his story *might* be true. They examined his data, made copies of his videos, and performed a thorough analysis of his clock. They tried to be discreet, but somehow the story leaked. As Ray had feared, the supermarket astonisher magazines ran wildly exaggerated stories about his contact. Some left readers with the impression that aliens were already entering our solar system, eager to shake hands (or tentacles) with the scientist who had decoded their message. Others derided the story as the biggest hoax since cold fusion. More mainstream news sources generally ignored the story. A few reported that SETI scientists were interviewing a community college teacher who claimed to have received a message from another planet, but Ray was relieved to discover that interest in the story died out within a few weeks and life got back to normal.

Two months later Ray got a phone call from a scientist at SETI. They had been searching for another clock like his to have in their lab "just in case." They found one in Italy. While they were negotiating with the owner to buy it he said it ran well but several months ago it started chiming at odd times. He took it to a repair shop but they couldn't fix it. Then, a couple months ago, it fixed itself. They contacted the repair shop, who verified the man's story, and the repairman said the case was so unusual

he took a video of it chiming erratically. The chiming on the video matched a segment of the pattern Ray reported, and the time stamp on the video matched the time when they calculated the clock in Italy would have lined up with Crystor.

SETI asked Ray to help them compose a reply.

[A big “thank-you” to my wife, who suggested this story. We have an antique clock which began chiming at odd times. She suggested maybe it was an alien signal and then said “you should write a story about it.”]