The Tachyon Paradox

The Preparation

June 14, 2029

Some of the foremost scientists of North America have gathered in Toronto (Ontario, Canada), to create a method of detecting 'tachyons,' hypothetical particles. They are particles, it is theorized, that travel faster than the speed of light. Some people have allegedly 'disproved' this theory, saying that it's impossible for anything to be accelerated past the speed of light. That is true, but that doesn't mean something can't travel past that speed - it just needs to have been always traveling at that speed.

"I'm telling you, it can't be done," Winston says. "We don't even know how fast they go, just that they're faster than light. The chance that one happens to be passing by when our devices check is astronomically slim."

Amy sighs, then says, "Winston, we all know that there is probably going to be a nuclear war within the next few years. We're doing this to prevent that, to save humanity. We need to do it for that chance." Winston and Amy work on tracking the activity on computer monitors, while Max uses wire, detection devices, and Erlenmeyer flasks to set up more detectors, which makes Winston grumble a bit.

Max says, "The way that I've set that up is that an alarm will sound if we detect one, and the info that we gather will show up on screen. We should get some good data if we happen to detect one."

Winston frowns, then says, "That seems an awful lot of information to get within a couple femtoseconds."

Amy pauses thoughtfully, then says, "It would probably be a little longer than that. The tachyon will be going faster than 299,792,458 meters per second, and that's 29,979,245,800 centimeters per second. It should be in range for about 200.1384 picoseconds."

"That's still not very helpful, Winston says. There won't be too much information to be gathered within that time."

Amy again admonishes him, saying, "Any chance is better than none at all, Winston. We need to keep going." Then the alarm sounds.

Max stands up, gaping in disbelief. “That’s the alarm for tachyon detection! We found one! Blimey, within three days, too. What does that say about our chances, Winston?”

“It says that we’re crazy lucky,” Winston says. “What did we find out?”

Amy checks out the numbers on the computer, then winces. “So… light goes at $3x10^8$ meters per second, and this particle goes at about $3x10^{23}$.”

“Wow,” Max says. “I have to agree with Winston on this one - that’s a pretty slim chance.”

Winson mutters to himself for a bit, then says, “Well, even if we got lucky this time, it doesn’t mean that the next tachyon won’t be going twice the speed, or faster. We can’t assume anything. Everybody gets lucky sooner or later.”

Amy hesitantly asks, “We know already that they’re about the size of a neutron. If they’re going that fast, wouldn’t it tear stuff apart as soon as it touches it?”

“I don’t know,” Max says. “Most matter is actually empty space, after all.”

She responds, “That may be true, but that still means that some matter is physically there. If the tachyon was going at that speed, it would hit something every few seconds. Let’s reason this out - why would that be?”

Winston grudgingly speaks up. “If the tachyon was magnetically charged, to an unbelievable extent, it might be able to swing around the positive/negative aspects of atoms, kind of like how the Voyager spacecraft left the solar system.”

Max says, “What I don’t understand is how these things travel through time… how does that actually work?”

“I was thinking about that,” Amy says. “You guys know how electrons have different energy levels, right? I was thinking that maybe these tachyons also have different energy levels, and that might affect how they move through time/space. Low energy might mean moving through space, and high energy might move through time.”

Max speaks up, admiration in his voice. “I’ve always thought of you as a nerd, Amy, but it’s coming in clutch now! What would happen at mid-range energy, in your scenario?”

Amy pauses to gather her thoughts, then replies, “I think that might be what we need. I think that at that level they would travel through space, but set everything back in time somehow. We would need to use those tendencies to send/receive our message.”

“So now we need to find a way to send a tachyon at a mid-range energy level,” Max reasons. “Do you think we’d be able to figure that out, Amy? Winston, we might need you to do some searching on the nets, find out how much time we have until war really breaks out.”

Amy pauses, then nods. “Sounds good, Max. We can try to set up a rudimentary receiving system over the next couple days, and then try to refine it.”

Winston finally speaks up again, expressing his dissatisfaction. “I’m not too happy with this ‘council’ thing we got goin’ on. I don’t really feel like I have a voice, just because I didn’t have a math background. I’ll go along with it, but I’m not too happy.” He storms out the door.

Amy speaks again. “I’m pretty confident that I can set up a board that changes colour from black to white and back again. That way, if any of the material is sent back in time, it would stand out. That way, we should be able to receive a message.”

They set to work, and get it done. After only a few days, they have made hundreds of small boards. They have decided on a system that has a 4x7 grid on each board, meaning 28 squares. Each square represents one letter, and they have also included space for a period and a comma. If a differently shaded dot appears on a square, that is the letter that was sent. No sooner have they got it set up than, observing it under a microscope, they see the different dots appear.

“That’s not possible,” Max breathes.

“Quick, get this down,” Amy says.

Max pulls a paper towards him and starts scribbling down the letters, not looking at the paper. When they finally look down at what he wrote, they see this message.

Guys, we screwed up. Badly. I’m sorry. I should have pushed harder. There was a nagging in my head all along, telling me that we shouldn’t have tried it. I wish I could stop it, but I can’t - we must continue on this path. We came too far to change the present, but we will change the past - and it wasn’t the right thing to do.

Winston

Post Script

A massive circle of the city, four kilometres wide, is unrecognisable. Where once was a massive, though derelict, building could now be an abstract painting. The white of ash, the grey of smoke, and the black of soot and char all blend together to form what could have been a painting of a winter scene - ash drifting through the sky like snow, blackened objects standing tall like winter trees, and all around, little fires burning. Some even look like campfires, neat and small. But if it's winter, it's winter in hell. It's not frigid, it's fiery. Fiery enough to melt the flesh off of your bones. However, there's something wrong with this scene. The flames, though hot, are only half there - you’d burn, but you’d only half feel it. And things look different, too - the flames are orange, and red, and yellow, and white, and every colour flames should be, but they are half-

transparent - like the ghost of a fire put out. The air, gray and filled with smoke, is bluer than it should be. If you concentrate, you can see white clouds, and bright sun, and blue sky, though the smoke should obscure. The whole city is like this. There, both a broken window lying shattered on the ground, and yet fitted into its frame and undamaged. Here, the ruins of the monstrous building, nearly leveled, but also the same building standing tall, reflecting the half-sun off of the half-windows. It's like two worlds colliding. Where there is a smoldering wreck of a park, there also are lush, green grass, and pristine cement walkways. And yes - clearly, and yet not there, is the laughter of children, the whirring of a free-wheeled bike mechanism. Like life and death. Heaven and hell. Through the fire and the ash stride Max Bulaustri, Amy Wilson, and Jack Brown. They gape in wonder, seeing the same sight as us. They succeeded in their goal, but in doing so they damned themselves to an eternal half-life. They saved the people, the children in the park, the adults in the cars, but you can't meddle with infinity free of consequences. They, mortals, brought about an alternate future. However, in that future, they have no meaning. In that place, there is no need for them to communicate with their past selves. They do not entirely belong in either world, so they are in both, forced eternally to watch both worlds. They will watch as the perfect, utopian world descends to war again, as all must, and they will also watch as the broken, burning world rebuilds itself. Trees grow, animals live and die, and a human civilization builds. In doing what they did, these three brilliant, idiotic people brought about the very thing they were trying to prevent. We live in the utopia, but for how long? Is it a pattern? Wars are already here. Will they lead to the one that teaches us peace for another few millennia, or do we still have a while yet?