

Last Contact

Stephen Baxter

March 15th

CAITLIN WALKED INTO the garden through the little gate from the drive. Maureen was working on the lawn.

Just at that moment Maureen's phone pinged. She took off her gardening gloves, dug the phone out of the deep pocket of her old quilted coat and looked at the screen. "Another contact," she called to her daughter.

Caitlin looked cold in her thin jacket; she wrapped her arms around her body. "Another super-civilization discovered, off in space. We live in strange times, Mum."

"That's the fifteenth this year. And I did my bit to help discover it. Good for me," Maureen said, smiling. "Hello, love." She leaned forward for a kiss on the cheek.

She knew why Caitlin was here, of course. Caitlin had always hinted she would come and deliver the news about the Big Rip in person, one way or the other. Maureen guessed what that news was from her daughter's hollow, stressed eyes. But Caitlin was looking around the garden, and Maureen decided to let her tell it all in her own time.

She asked, "How're the kids?"

"Fine. At school. Bill's at home, baking bread." Caitlin smiled. "Why do stay-at-home fathers always bake bread? But he's starting at Webster's next month."

"That's the engineers in Oxford?"

"That's right. Not that it makes much difference now. We won't run out of money before, well, before it doesn't matter." Caitlin considered the garden. It was just a scrap of lawn really, with a quite nicely stocked border, behind a cottage that was a little more than a hundred years old, in this village on the outskirts of Oxford. "It's the first time I've seen this properly."

"Well, it's the first bright day we've had. My first spring here." They

walked around the lawn. "It's not bad. It's been let to run to seed a bit by Mrs. Murdoch. Who was another lonely old widow," Maureen said.

"You mustn't think like that."

"Well, it's true. This little house is fine for some-one on their own, like me, or her. I suppose I'd pass it on to somebody else in the same boat, when I'm done."

Caitlin was silent at that, silent at the mention of the future.

Maureen showed her patches where the lawn had dried out last summer and would need reseeded. And there was a little brass plaque fixed to the wall of the house to show the level reached by the Thames floods of two years ago. "The lawn is all right. I do like this time of year when you sort of wake it up from the winter. The grass needs raking and scarify-ing, of course. I'll reseed bits of it, and see how it grows during the summer. I might think about getting some of it relaid. Now the weather's so different, the drainage might not be right anymore."

"You're enjoying getting back in the saddle, aren't you, Mum?"

Maureen shrugged. "Well, the last couple of years weren't much fun. Nursing your dad, and then getting rid of the house. It's nice to get this old thing back on again." She raised her arms and looked down at her quilted gardening coat.

Caitlin wrinkled her nose. "I always hated that stupid old coat. You really should get yourself something better, Mum. These modern fabrics are very good."

"This will see me out," Maureen said firmly.

They walked around the verge, looking at the plants, the weeds, the autumn leaves that hadn't been swept up and were now rotting in place.

Caitlin said, "I'm going to be on the radio later. BBC Radio 4. There's to be a government state-ment on the Rip, and I'll be in the follow-up discussion. It starts at nine, and I should be on about nine-thirty."

"I'll listen to it. Do you want me to tape it for you?"

"No. Bill will get it. Besides, you can listen to all these things on the websites these days."

Maureen said carefully, "I take it the news is what you expected, then."

"Pretty much. The Hawaii observatories confirmed it. I've seen the new Hubble images, deep sky fields. Empty, save for the foreground objects. All the galaxies beyond the local group have gone. Eerie, really, seeing your predictions come true like that. That's couch grass, isn't it?"

"Yes. I stuck a fork in it. Nothing but root mass underneath. It will be a devil to get up. I'll have a go, and then put down some bin liners for a few weeks, and see if that kills it off. Then there are these roses that should have been pruned by now. I think I'll plant some gladioli in this corner—"

"Mum, it's October." Caitlin blurted that out. She looked thin, pale, and tense, a real office worker, but then Maureen had always thought that about her daughter, that she worked too hard. Now she was thirty-five, and her moderately pret-ty face was lined at the eyes and around her mouth, the first wistful signs of age. "October 14th, at about four in the afternoon. I say 'about.' I could give you the time down to the attosecond if you wanted."

Maureen took her hands. "It's all right, love. It's about when you thought it would be, isn't it?"

"Not that it does us any good, knowing. There's nothing we can do about it."

They walked on. They came to a corner on the south side of the little garden. "This ought to catch the sun," Maureen said. "I'm thinking of putting in a seat here. A pergola maybe. Somewhere to sit. I'll see how the sun goes around later in the year."

"Dad would have liked a pergola," Caitlin said. "He always did say a garden was a place to sit in, not to work."

"Yes. It does feel odd that your father died, so soon before all this. I'd have liked him to see it out. It seems a waste somehow."

Caitlin looked up at the sky. "Funny thing, Mum. It's all quite invisible to the naked eye still. You can see the Andromeda Galaxy, just, but that's bound to the Milky Way by gravity. So the expansion hasn't reached down to the scale of the visible, not yet. It's still all instruments, telescopes. But it's real all right."

“I suppose you’ll have to explain it all on Radio 4.”

“That’s why I’m there. We’ll probably have to keep saying it over and over, trying to find ways of saying it that people can understand. *You* know, don’t you, Mum? It’s all to do with dark energy. It’s like an antigravity field that permeates the uni-verse. Just as gravity pulls everything together, the dark energy is pulling the universe apart, taking more and more of it so far away that its light can’t reach us anymore. It started at the level of the largest structures in the universe, superclusters of galaxies. But in the end it will fold down to the smallest scales. Every bound structure will be pulled apart. Even atoms, even subatomic parti-cles. The Big Rip.

“We’ve known about this stuff for years. What we didn’t expect was that the expansion would accelerate as it has. We thought we had trillions of years. Then the forecast was billions. And now—”

“Yes.”

“It’s funny for me being involved in this stuff, Mum. Being on the radio. I’ve never been a peo-ple person. I became an astrophysicist, for God’s sake. I always thought that what I studied would have absolutely no effect on anybody’s life. How wrong I was. Actually there’s been a lot of debate about whether to announce it or not.”

“I think people will behave pretty well,” Mau-reen said. “They usually do. It might get trickier toward the end, I suppose. But people have a right to know, don’t you think?”

“They’re putting it on after nine, so people can decide what to tell their kids.”

“After the watershed! Well, that’s considerate. Will you tell your two?”

“I think we’ll have to. Everybody at school will know. They’ll probably get bullied about it if they don’t know. Imagine that. Besides, the little beg-gars will probably have googled it on their mobiles by one minute past nine.”

Maureen laughed. “There is that.”

“It will be like when I told them Dad had died,” Caitlin said. “Or like when Billy started asking hard questions about Santa Claus.”

“No more Christmases,” Maureen said sudden-ly. “If it’s all over in

October.”

“No more birthdays for my two either,” Caitlin said.

“November and January.”

“Yes. It’s funny, in the lab, when the date came up, that was the first thing I thought of.”

Maureen’s phone pinged again. “Another signal. Quite different in nature from the last, according to this.”

“I wonder if we’ll get any of those signals decod-ed in time.”

Maureen waggled her phone. “It won’t be for want of trying, me and a billion other search-for-ET-at-home enthusiasts. Would you like some tea, love?”

“It’s all right. I’ll let you get on. I told Bill I’d get the shopping in, before I have to go back to the studios in Oxford this evening.”

They walked toward the back door into the house, strolling, inspecting the plants and the scrappy lawn.

* * * *

June 5th

IT WAS ABOUT lunchtime when Caitlin arrived from the garden center with the pieces of the per-gola. Maureen helped her unload them from the back of a white van, and carry them through the gate from the drive. They were mostly just prefab-ricated wooden panels and beams that they could manage between the two of them, though the big iron spikes that would be driven into the ground to support the uprights were heavier. They got the pieces stacked upon the lawn.

“I should be able to set it up myself,” Maureen said. “Joe next door said he’d lay the concrete base for me, and help me lift on the roof section. There’s some nailing to be done, and creosoting, but I can do all that.”

“Joe, eh?” Caitlin grinned.

“Oh, shut up, he’s just a neighbor. Where did you get the van? Did you have to hire it?”

“No, the garden center loaned it to me. They can’t deliver. They are still getting stock in, but they can’t rely on the staff. They just quit, without any notice. In the end it sort of gets to you, I suppose.”

“Well, you can’t blame people for wanting to be at home.”

“No. Actually Bill’s packed it in. I meant to tell you. He didn’t even finish his induction at Web-ster’s. But the project he was working on would never have got finished anyway.”

“I’m sure the kids are glad to have him home.”

“Well, they’re finishing the school year. At least I think they will, the teachers still seem keen to carry on.”

“It’s probably best for them.”

“Yes. We can always decide what to do after the summer, if the schools open again.”

Maureen had prepared some sandwiches, and some iced elderflower cordial. They sat in the shade of the house and ate their lunch and looked out over the garden.

Caitlin said, “Your lawn’s looking good.”

“It’s come up quite well. I’m still thinking of relaying that patch over there.”

“And you put in a lot of vegetables in the end,” Caitlin said.

“I thought I should. I’ve planted courgettes and French beans and carrots, and a few outdoor tomatoes. I could do with a greenhouse, but I haven’t really room for one. It seemed a good idea, rather than flowers, this year.”

“Yes. You can’t rely on the shops.”

Things had kept working, mostly, as people stuck to their jobs. But there were always gaps on the supermarket shelves, as supply chains broke down. There was talk of rationing some essentials, and there were already coupons for petrol.

"I don't approve of how tatty the streets are getting in town," Maureen said sternly.

Caitlin sighed. "I suppose you can't blame people for packing in a job like street-sweeping. It is a bit tricky getting around town though. We need some work done on the roof, we're missing a couple of tiles. It's just as well we won't have to get through another winter," she said, a bit darkly. "But you can't get a builder for love or money."

"Well, you never could."

They both laughed.

Maureen said, "I told you people would cope. People do just get on with things."

"We haven't got to the end game yet," Caitlin said. "I went into London the other day. That isn't too friendly, Mum. It's not all like this, you know."

Maureen's phone pinged, and she checked the screen. "Four or five a day now," she said. "New contacts, lighting up all over the sky."

"But that's down from the peak, isn't it?"

"Oh, we had a dozen a day at one time. But now we've lost half the stars, haven't we?"

"Well, that's true, now the Rip has folded down into the galaxy. I haven't really been following it, Mum. Nobody's been able to decode any of the signals, have they?"

"But some of them aren't the sort of signal you can decode anyhow. In one case somebody picked up an artificial element in the spectrum of a star. Something that was manufactured, and then just chucked in to burn up, like a flare."

Caitlin considered. "That can't say anything but 'here we are,' I suppose."

"Maybe that's enough."

"Yes."

It had really been Harry who had been interest-ed in wild speculations about alien life and so forth. Joining the phone network of home observers of ET, helping to analyze possible signals from the stars in a network of millions of others, had been Harry's hobby, not Maureen's. It was one of Harry's things she had kept up after he had died, like his weather monitoring and his football pools. It would have felt odd just to have stopped it all.

But she did understand how remarkable it was that the sky had suddenly lit up with messages like a Christmas tree, after more than half a century of dogged, fruitless, frustrating listening. Harry would have loved to see it.

"Caitlin, I don't really understand how all these signals can be arriving just now. I mean, it takes years for light to travel between the stars, doesn't it? We only knew about the phantom energy a few months ago."

"But others might have detected it long before, with better technology than we've got. That would give you time to send something. Maybe the signals have been timed to get here, just before the end, aimed just at us."

"That's a nice thought."

"Some of us hoped that there would be an answer to the dark energy in all those messages."

"What answer could there be?"

Caitlin shrugged. "If we can't decode the mes-sages we'll never know. And I suppose if there was anything to be done, it would have been done by now."

"I don't think the messages need decoding," Maureen said.

Caitlin looked at her curiously, but didn't pursue it. "Listen, Mum. Some of us are going to try to do something. You understand that the Rip works down the scales, so that larger structures break up first. The galaxy, then the solar system, then plan-ets like Earth. And then the human body."

Maureen considered. "So people will outlive the Earth."

"Well, they could. For maybe about thirty min-utes, until atomic structures get pulled apart. There's talk of establishing a sort of shelter in Oxford that could survive the end of the Earth. Like a submarine, I suppose. And if you wore a pressure suit you might last a bit longer even than that.

The design goal is to make it through to the last microsecond. You could gather another thirty minutes of data that way. They've asked me to go in there."

"Will you?"

"I haven't decided. It will depend on how we feel about the kids, and—you know."

Maureen considered. "You must do what makes you happy, I suppose."

"Yes. But it's hard to know what that is, isn't it?" Caitlin looked up at the sky. "It's going to be a hot day."

"Yes. And a long one. I think I'm glad about that. The night sky looks odd now the Milky Way has gone."

"And the stars are flying off one by one," Caitlin murmured. "I suppose the constellations will look funny by the autumn."

"Do you want some more sandwiches?"

"I'll have a bit more of that cordial. It's very good, Mum."

"It's elderflower. I collect the blossoms from that bush down the road. I'll give you the recipe if you like."

"Shall we see if your Joe fancies laying a bit of concrete this afternoon? I could do with meeting your new beau."

"Oh, shut up," Maureen said, and she went inside to make a fresh jug of cordial.

* * * *

October 14th

THAT MORNING MAUREEN got up early. She was pleased that it was a bright morning, after the rain of the last few days. It was a lovely autumn day. She had breakfast listening to the last-ever episode of *The Archers*, but her radio battery failed before the end.

She went to work in the garden, hoping to get everything done before

the light went. There was plenty of work, leaves to rake up, the roses and the clematis to prune. She had decided to plant a row of daffodil bulbs around the base of the new pergola.

She noticed a little band of goldfinches, plun-dering a clump of Michaelmas daisies for seed. She sat back on her heels to watch. The colorful little birds had always been her favorites.

Then the light went, just like that, darkening as if somebody was throwing a dimmer switch. Maureen looked up. The sun was rushing away, and sucking all the light out of the sky with it. It was a remarkable sight, and she wished she had a camera. As the light turned gray, and then charcoal, and then utterly black, she heard the goldfinches fly off in a clatter, confused. It had only taken a few minutes.

Maureen was prepared. She dug a little torch out of the pocket of her old quilted coat. She had been hoarding the batteries; you hadn't been able to buy them for weeks. The torch got her as far as the pergola, where she lit some rush torches that she'd fixed to canes.

Then she sat in the pergola, in the dark, with her garden lit up by her rush torches, and waited. She wished she had thought to bring out her book. She didn't suppose there would be time to finish it now. Anyhow, the flickering firelight would be bad for her eyes.

"Mum?"

The soft voice made her jump. It was Caitlin, threading her way across the garden with a torch of her own.

"I'm in here, love."

Caitlin joined her mother in the pergola, and they sat on the wooden benches, on the thin cushion Maureen had been able to buy. Caitlin shut down her torch to conserve the battery.

Maureen said, "The sun went, right on cue."

"Oh, it's all working out, bang on time."

Somewhere there was shouting, whooping, a tin-kle of broken glass.

"Someone's having fun," Maureen said.

“It’s a bit like an eclipse,” Caitlin said. “Like in Cornwall, do you remember? The sky was cloudy, and we couldn’t see a bit of the eclipse. But at that moment when the sky went dark, everybody got excited. Something primeval, I suppose.”

“Would you like a drink? I’ve got a flask of tea. The milk’s a bit off, I’m afraid.”

“I’m fine, thanks.”

“I got up early and managed to get my bulbs in. I didn’t have time to trim that clematis, though. I got it all ready for the winter, I think.”

“I’m glad.”

“I’d rather be out here than indoors, wouldn’t you?”

“Oh, yes.”

“I thought about bringing blankets. I didn’t know if it would get cold.”

“Not much. The air will keep its heat for a bit. There won’t be time to get very cold.”

“I was going to fix up some electric lights out here. But the power’s been off for days.”

“The rushes are better, anyway. I would have been here earlier. There was a jam by the church.

All the churches are packed, I imagine. And then I ran out of petrol a couple of miles back. We haven’t been able to fill up for weeks.”

“It’s all right. I’m glad to see you. I didn’t expect you at all. I couldn’t ring.” Even the phone networks had been down for days. In the end everything had slowly broken down, as people simply gave up their jobs and went home. Maureen asked carefully, “So how’s Bill and the kids?”

“We had an early Christmas,” Caitlin said. “They’ll both miss their birthdays, but we didn’t think they should be cheated out of Christmas too. We did it all this morning. Stockings, a tree, the decorations and the lights down from the loft, presents, the lot. And then we had a big lunch. I couldn’t find a turkey but I’d been saving a chicken. After lunch the kids went for their nap. Bill put their pills in their lemonade.”

Maureen knew she meant the little blue pills the NHS had given out to every household.

“Bill lay down with them. He said he was going to wait with them until he was sure—you know. That they wouldn’t wake up, and be distressed. Then he was going to take his own pill.”

Maureen took her hand. “You didn’t stay with them?”

“I didn’t want to take the pill.” There was some bitterness in her voice. “I always wanted to see it through to the end. I suppose it’s the scientist in me. We argued about it. We fought, I suppose. In the end we decided this way was the best.”

Maureen thought that on some level Caitlin couldn’t really believe her children were gone, or she couldn’t keep functioning like this. “Well, I’m glad you’re here with me. And I never fancied those pills either. Although—will it hurt?”

“Only briefly. When the Earth’s crust gives way. It will be like sitting on top of an erupting volcano.”

“You had an early Christmas. Now we’re going to have an early Bonfire Night.”

“It looks like it. I wanted to see it through,” Caitlin said again. “After all I was in at the start—those supernova studies.”

“You mustn’t think it’s somehow your fault.”

“I do, a bit,” Caitlin confessed. “Stupid, isn’t it?”

“But you decided not to go to the shelter in Oxford with the others?”

“I’d rather be here. With you. Oh, but I brought this.” She dug into her coat pocket and produced a sphere, about the size of a tennis ball.

Maureen took it. It was heavy, with a smooth black surface.

Caitlin said, “It’s the stuff they make space shuttle heatshield tiles out of. It can soak up a lot of heat.”

“So it will survive the Earth breaking up.”

“That’s the idea.”

“Are there instruments inside?”

“Yes. It should keep working, keep recording until the expansion gets down to the centimeter scale, and the Rip cracks the sphere open. Then it will release a cloud of even finer sensor units, motes we call them. It’s nanotechnology, Mum, machines the size of molecules. They will keep gathering data until the expansion reaches molec-ular scales.”

“How long will that take after the big sphere breaks up?”

“Oh, a microsecond or so. There’s nothing we could come up with that could keep data-gathering after that.”

Maureen hefted the little device. “What a won-derful little gadget. It’s a shame nobody will be able to use its data.”

“Well, you never know,” Caitlin said. “Some of the cosmologists say this is just a transition, rather than an end. The universe has passed through transitions before, for instance from an age dominated by radiation to one dominated by matter—our age. Maybe there will be life of some kind in a new era dominated by the dark energy.”

“But nothing like us.”

“I’m afraid not.”

Maureen stood and put the sphere down in the middle of the lawn. The grass was just faintly moist, with dew, as the air cooled. “Will it be all right here?”

“I should think so.”

The ground shuddered, and there was a sound like a door slamming, deep in the ground. Alarms went off, from cars and houses, distant wails. Maureen hurried back to the pergola. She sat with Caitlin, and they wrapped their arms around each other.

Caitlin raised her wrist to peer at her watch, then gave it up. “I don’t suppose we need a countdown.”

The ground shook more violently, and there was an odd sound, like

waves rushing over pebbles on a beach. Maureen peered out of the pergola. Remark-ably, one wall of her house had given way, just like that, and the bricks had tumbled into a heap.

“You’ll never get a builder out now,” Caitlin said, but her voice was edgy.

“We’d better get out of here.”

“All right.”

They got out of the pergola and stood side by side on the lawn, over the little sphere of instru-ments, holding onto each other. There was another tremor, and Maureen’s roof tiles slid to the ground, smashing and tinkling.

“Mum, there’s one thing.”

“Yes, love.”

“You said you didn’t think all those alien signals needed to be decoded.”

“Why, no. I always thought it was obvious what all the signals were saying.”

“What?”

Maureen tried to reply.

The ground burst open. The scrap of dewy lawn flung itself into the air, and Maureen was thrown down, her face pressed against the grass. She glimpsed houses and trees and people, all flying in the air, underlit by a furnace-red glow from beneath.

But she was still holding Caitlin. Caitlin’s eyes were squeezed tight shut. “Goodbye,” Maureen yelled. “They were just saying goodbye.” But she couldn’t tell if Caitlin could hear.

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