IDIOPATHIC

AN ANTHOLOGY OF PUZZLES WRAPPED UP IN SCIENCE-FICTION STORIES WITH A MEDICAL THEME

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For the best wife in the world, Jordi.

Contents

Preface

idiopathic
adjective
id·i·o·path·ic ˌi-dē-ə-ˈpa-thik
1 arising spontaneously or from an obscure or unknown cause
2 peculiar to the individual

If you're a medical professional (or anybody with an interest in medicine), and you also happen to be a sci-fi geek, you are the target audience for this book: five of my medically themed sci-fi short stories, each containing a central puzzle.

We'll start with *Slime for Brains*, a puzzle that's short and sweet, with the solution comprehensively explained at the end. The second puzzle, *Instruments for Monkeys*, is just as short and sweet, but the solution takes the form of a continuation of the story, as the reader is expected to do more of the explanatory work themselves. After these brief warm-ups, the longer puzzle stories begin. *Leviathanology* contains a knotty ethical and political conundrum sure to rival any absurdity you may have witnessed in the NHS. Then you can

try your hand at *Surviving Nix-47*, a choose-your-own-adventure puzzle requiring a healthy dose of clinical reasoning. The last story is *Limitations*, which won me the James White Award in 2019 and was published in Interzone #289, as well as being translated into Italian for an anthology. I have reproduced it here with an interlude towards the end, in which the reader is given a chance to solve the chemistry-based puzzle before the story concludes.

Slime for Brains

The Steward

You know, when I signed up for this steward job, I didn't expect to spend my days babysitting smart snot. But here I am, standing in front of Tank 44B, staring at what looks like the aftermath of a jellyfish orgy stuck to a copper wafer. They call it a "living computer," but honestly, it feels more like a poorly behaved pet. And now, thanks to some overeager growth spurt, I have to sterilise the thing. Lucky me.

The tank setup is all marvellously high-tech: tubes, monitors, blinking lights that make it look like NASA mission control had a drunken fling with a fish farm. But all that glamour fades fast when you realise the main job is making sure the goo doesn't mutate into something that tries to unionise.

So there I am, staring into the tank at the pulsating blob. It's weirdly hypnotic, like watching an alien heartbeat. They told us during training not to anthropomorphise the slime, because apparently when you've spent enough time cleaning up after one of these things, you start wondering if it dreams about something other than eating. Speaking of which—yes, you do have to feed the computer. And no, I don't mean plug

it in; I mean actual nutrients. They gave me a checklist for "balanced meals for optimal computational performance." I kid you not. If you don't feed them properly, their immune systems fail and they catch diseases. They're snotty enough without the flu.

Now, Tank 44B had been behaving itself up until this morning, when that little red warning light started blinking. I'm told red lights in this job never mean something fun like "Your computer is solving world hunger." No, it's always, "Congratulations, you're about to deal with bio-goop gone rogue."

Enter the lab tech: a scruffy kid who looks like he rolled out of bed five minutes ago and grabbed the wrong size lab coat on his way in. He yawns, pokes at the console, and—because why not—dips his hands directly into the tank. Of course, this goes about as well as you'd expect. The goo spills out like it's auditioning for a role in *The Blob: Director's Cut*. He mutters something in Mandarin that I'm pretty sure translates to "Oh, crap," grabs a vial, and scurries off to run tests.

Fast-forward an hour, and guess what? The slime has cancer. Don't ask me how a computer gets cancer—DNA subroutines, nuclei, something about binary fission. All I know is this thing is officially defective, which means I get the honour of performing "sterilisation." That's fancy talk for "murdering a puddle of slime with dignity."

So now, here I am, suited up in my sterilisation gear, holding a hose full of industrial-grade cleansing solution. It's my first day, by the way, and I can already hear the manager's voice in my head: *"It's just like cleaning your home computer!"* Sure, if your home computer was alive, cancerous and slightly resentful.

The protocol says it'll take 30 minutes. What the protocol

doesn't say is that the goo will resist. As soon as I start the process, it starts pulsating wildly, like it knows what's coming. I swear I heard a squelchy noise that sounded suspiciously like "Why?" It's almost enough to make me feel bad. Almost. But then I remember the blob tried to eat its tank earlier, so, you know—justice.

As the sterilisation wraps up, I look around the farm at the thousands of tanks, each housing its own little pulsating slime brain, each computer cloned from the one beside it. This whole place is like the motherboard of God, they said. It feels more like I'm cleaning up after His pet project gone wrong.

Lesson learned: Never trust a job description that uses the word "innovative."

Question

The steward's life is now over.

Their cause of death was obvious on visual inspection of the body.

Why?

Answer

Disregard electrocution and toxicity; such a computer would not be safe for the general public. Also disregard causes of cardiac arrest; the steward was young, healthy and not under significant physical exertion.

The most obvious answer is that the cancer killed the steward, but this is foolish. While it is indeed possible for some cancers to spread to other individuals (see: Tasmanian Devil Facial Tumour disease), no cancer would kill quickly enough to explain the steward's death.

Other things we know about these computers: they reproduce via binary fission, and they contain nuclei so must be eukaryotic. However, the most interesting thing we are told is they are at risk of infectious diseases.

The presence of a contagion could never be tolerated within a farming environment. Any infection could rapidly spread and wipe out every computer on the farm. In fact, we know the slime computers must be particularly vulnerable to epidemics because we are told they are clones.

From this, we can infer that every slime computer on the farm must be supplied with prophylactic antibiotics. Yes,

humanity is slow to learn from its mistakes.

The scientist who first diagnosed the computer did not experience any ill effects so we infer the problem is specific to this steward. It is the steward's first day on the job; first exposure to farm computers.

The time till death was half an hour because this is the amount of time the errand normally requires and therefore how long the steward can spend in the farm before their whereabouts are investigated. Last, we know the cause of death was obvious on visual inspection.

All of this is consistent with an anaphylactic reaction, which would be visually recognisable from the urticaria and angioedema. Thus we conclude the steward was allergic to the prophylactic antibiotics, or maybe even the slime computer itself. Remember: common things are common.

Always carry your Epi-pen, folks.

Instruments for Monkeys

The Manual

Proper care and maintenance will prolong the life of your Karkon+ instruments.

The cerebral implants of your instruments will corrode over time and should be replaced every month. Failure to do so may result in loss of instrument responsiveness, conferring a high risk of injury to your patient. While our quality control methodology has been rated best in the industry, patients should still be counselled on the risks of instrument failure. These include, but are not limited to, the following:

(1) Defective instruments may exhibit strange behaviours. In particular, male instruments may attempt to copulate with tumours or other round-bodied structures. While only two case reports have been published thus far, and we understand this unusual behaviour is amusing, we urge surgeons to maintain their professionalism in the face of any peculiar circumstances; the patient is often under spinal anaesthesia and is therefore aware of ongoing conversations between theatre staff. It is in everyone's best interests to avoid a repeat of *Evans-*

Jones v Manchester Teaching Hospitals Trust [2096].

(2) The Karkon+ is based on a species with a high coefficient of aggression. While genetic modification has enabled us to purge this trait, random genetic drift remains an inherent feature of DNA-based instruments. Unfortunately, this means that defective instruments may, on occasion, recapitulate the highly territorial behaviours seen in the wild-type *Trapezia intermedia*. In such cases, we recommend the instrument be removed from the patient without delay. Conversion to open surgery should be considered in the first instance.

It has been reported by certain tabloid publications that our instruments, upon emergence from their implant-induced trance, experience a mental state often equated with existential dread. We reiterate here: there is no evidence to suggest our instruments have any ability to grasp the concept of free will, or their lack of it. Surgical Zoo Ltd adheres to the strictest code of bioethics as per European Commission requirements.

When not in use, your instruments should be stored in a filtered marine environment with adequate coral biodiversity. Failure to provide a balanced diet for your instruments may compromise their haemostatic secretions, resulting in peri-operative haemorrhage and the subsequent death of your patient. We take no responsibility for morbidity or mortality relating to inappropriate care of instruments. Dietary recommendations are covered in section five. Aquarium maintenance is covered in section six.

As part of their natural life cycle, every instrument will undergo annual moulting. If this occurs while your instrument is in use, we recommend incinerating the moult carapace, as failure to do so may lead to inflammation and

scarring at the surgical site. As such, any patient complaining of longstanding post-operative pain, in the absence of clinical signs, should raise suspicions of Karkon+ fragment retention.

We clarify here that the same cautions do not apply to the faeces of your instruments. Patients may be reassured that Karkon+ faecal matter is non-toxic and, contrary to popular belief, has not been linked to intra-abdominal infection or increased flatulence. Furthermore, there is no evidence that Karkon+ faeces possess aphrodisiac properties, although those who wish to purchase the faeces may do so from our authorised dealerships. Other faeces for medical usage are available too.

The Puzzle

Lady Fletcher is a 79-year-old pensioner, normally confined to a wheelchair, who undergoes a cholecystectomy using the Karkon+ surgical system. The operation is uneventful. She is found dead in her mansion two weeks later with multiple puncture wounds in her abdomen.

Lady Fletcher leaves behind two sons, one of whom works at the same hospital where she was treated, and he therefore files an official complaint as he blames her surgeon for the death.

1. What does the autopsy reveal and why?
2. Who is responsible for the death?

The Recall Notice

2102-06-17 Recall: Surgical Zoo Ltd – Karkon+ surgical instruments

The following notice appears on the Surgical Zoo Ltd website:

Patient safety is our priority, which is why we are proactively recalling certain variants of Karkon+ bred between 2100 and 2102. This decision is a consequence of the case published in the *Journal of Surgical Case Reports*, March 2102.

All Karkon+ variants are deliberately engineered to lack reproductive capabilities, because sexual reproduction introduces random genetic variation, and variation is anathema to effective quality control. We are sorry to report that the Karkon+ S92 implicated in the recent case report appears to have re-gained the ability to reproduce.

We graciously thank the family of the late Lady Fletcher for allowing us to recover twenty-three of the S92 deviant's offspring at the time of her autopsy, and we offer our most sincere condolences. The Surgical Zoo forensic team has been working around the clock to ensure Lady Fletcher's family

receive closure as soon as possible.

Presently, we can confirm that the recovered specimens do not match the genetic serial number of the instrument used for Lady Fletcher's cholecystectomy. The inescapable conclusion: a defective instrument was introduced some time post-operatively by persons as yet unknown. Lady Fletcher's death is therefore being treated as suspicious and police investigations are under way.

Although current evidence suggests this was an isolated incident, we appreciate the general public's anxieties around "being eaten alive from the inside out" (*The Sun*, April 12th), even if the idea is mostly unfounded in reality. Regrettably, we have therefore decided to recall all S90-series instruments, to allow us to rule out further deviants. This is meant only as a precaution and an assurance to the public that we are doing everything we can to ensure the S92 incident does not occur a fourth time.

To find out whether your Karkon+ instruments are being recalled, you need only check your aquarium. Recalled instruments will be attempting to leave their tanks. Please allow them to make their own way to pre-arranged collection points.

If your Karkon+ instruments are being recalled, you can choose between two options:

- A free-of-charge set of delousing tarantulas (Pedicularus Expel)
- A free-of-charge set of coronary intervention nematodes (PCI-Nems)

Thank you for choosing Surgical Zoo Ltd

Leviathanology

Why are they called space whales?

You were born yesterday, decided Surgeon-General Mr. Cusher. The skin-grafted stopwatch was the surest sign of a naive blood-runner. That radiography prosthetic, however, was never intended for hapless juniors. He'd have to ask Joe why he'd bought such a waste of money, but first, this new patient. What was he again?

"...reported finding argoliths mixed in with his stools," said Joe, "but has not noticed any weight loss. Past medical history includes—"

"Hold it. I wasn't listening fully." Cusher shuffled in his stool. "Did you say 'Astro-Cetacean'?"

"That's right," answered Joe with relief, "Morphology's almost textbook."

"Don't see one of those often," said Cusher, "Which ward are they on?"

"They're still in S.A.U."

Cusher stood up and stretched.

"H-Hey," said Joe, "How...how would you feel about taking Granth to see the Astro-Cetacean?" He pointed to a dawdling stranger. "Medical student—just started placement

here."

Granth rushed to catch up with Cusher, who marched along the corridors as if harassed by personified Death— so regular a visitor some might have considered him staff.

"What's the story then?" asked Granth.

"Silver stools and that kind of epigastric pain in an old space-whale: invariably going to be pancreatic cancer."

"You told him you hadn't been listening," Granth pointed out. An incoming hospital bed caused them both to take evasive action.

"Of course I was listening, but telling a colleague, 'I've heard enough you can stop talking now,' is not professional behaviour...so I'm told." Cusher gave a half shrug. "Besides, he's a sensitive soul is young Joe— only his second year on the job."

Granth paused, not quite knowing how to respond. "So this space-whale then...how did a non-human get a pancreas?" He bowed his head in deference. "I've only just...uh...finished the human stuff. Sixth year."

Cusher released an exasperated sigh.

"'Pancreas' is just the generic term we use for any organ that secretes digestive substances as its primary function." Granth was forced aside by a hurrying doctor. Cusher continued oblivious. "Yes, sometimes patients complain about our anthropocentric terms, but remember to inform them that if they don't like it, they can piss off to a different hospital. Or don't— apparently that's not professional behaviour either."

Granth's eyes widened at the use of profanity. He allowed a chuckle to escape but quickly regained composure. The hubbub of roaring engines was growing in proportion to his excitement.

"I think we're going to miss that shuttle." Cusher broke

into a sprint.

Angular hatches folded shut the moment they were on board and their planet was soon receding into wherever. The ride was uncomfortable. A full hour passed before anything knocked against the starry backdrop.

"Here." Cusher gestured at an approaching moon. "The leviathanic wards. You see them?" Granth nodded. A curling meshwork of infrastructure was now visible. "Each patient gets their own space-port. Granted, you do need it when you're that size. Look, there's our patient."

He pointed to a behemoth almost camouflaged against the darkness. As the shuttle edged closer, the space-whale's outline dispelled its shadow. Granth could now trace the grizzled fronds that erupted from its carapace, like so many leaves from some diabolical admixture of conifer and starfish. Each leaf terminated in a nozzle that would sporadically eject streams of rocky detritus.

"He looks distinctly unhappy if you ask me. Look at the way his propulsors are twitching," said Cusher, "Hope they've managed to find some effective analgesics. It's always a hassle with the anti-organic biochemistries."

A heavy clunk signalled the end of the docking procedure, and the hatches unfolded to allow passengers to spill onto an already overcrowded platform.

"Why are they called space-whales?" Granth cocked his head. "They look more like...giant pine trees than whales."

Cusher shrugged.

"Tradition."

Clinical Correlation

The sign said 'Surgical Assessment Unit', but it was an aircraft hangar by any other standard: an abundance of heavy-duty vehicles and not a medical device in sight. Not a single machine bleeped in dutiful repetition. Not a single whiff of vomit clung to a ragged uniform. Cusher strolled up to reception and found himself a nurse to badger.

"Are the veterinaries here yet?"

"They're just seeing the patient now, Mr. Cusher. I'll let them know you've arrived."

Cusher snatched a glass tablet and scrolled through the patient's notes. Granth was still straining his neck at the enormity of the place. A tunnel-boring machine grumbled past without provoking any reaction from passers-by. Cusher motioned for Granth to join him.

"Nice case," he said, "Looks like this patient's read—no—written the textbook." Granth simulated a look of perfect comprehension.

"What does that symbol mean?" he asked.

"City carrier." Cusher grimaced. "Means we'll have to deal with politicians. I've never understood the appeal of an entire

population of humanoids all eating, fucking and shitting away on top of you while you're just trying to drift through space minding your own business."

"Mr. Cusher! Pleasure to see you again."

Granth turned towards the newcomer and noted he was short and nervous-looking. Cusher continued to focus on the patient's records until satisfied the newcomer was short and nervous-looking enough.

"Dr. Arvo, how are you today?"

"I'm g—"

"Fascinating, now tell me about Mackorr Shel-Khessed, our space-whale friend. Looked like he needed some serious pain-relief. Explain."

"We're...trying." Arvo was used to recovering from Cusher's interruptions. "His city's council isn't allowing us to prescribe anything until they've debated and voted on it first."

"So what's the problem then?"

Arvo rubbed the back of his head. He'd slept through much of his latest meeting with the council. Mercifully, they hadn't noticed.

"Each meeting lasts around five hours."

"Politicians," spat Cusher, "Can't we pull the 'best interests' card and just ignore them?"

"They've threatened to declare war on the hospital if we try. The city is armed to the armpits with... with sub-nuclear...warheads," stuttered Arvo, twitching at the word 'nuclear'.

"Warheads." Cusher frowned. "Well have they asked Mackorr himself what he wants?"

"Apparently he's left it up to them to make the decisions." Arvo adjusted his glasses. "Our independent translator confirmed it."

"Those space-whales are too trusting," said Cusher, "Or just indecisive. Maybe that's why they carry cities around—to make all the decisions for them." Arvo opened his mouth to disagree but Cusher refocused on the tablet. "Have you done an S.R. yet?"

"We have...done...that." Arvo scurried over to a large monitor by the reception desk. He swung it round to face Cusher. "The radiologist reported a 220 kilometre wide pancreatic mass obstructing the inferior duct." He pointed to a fuzzy monochrome image. "She says it's suspicious for pseudocyst but can't rule out cancer; recommends clinical correlation."

"Is the other pancreas in good shape?"

Arvo pushed his glasses up his nose. "The evidence says...yes."

"Then we'll do a vessel-assisted Whipple's," decided Cusher, "Get the patient consented and we'll meet at *God's Scalpel* before lunch."

Godly Instruments

Function dictated its aesthetics. Steel-ceramic panels would have gleamed with cold sterility, were they not bashed inwards, and in many places corroded by noxious bodily fluids. The only decoration was a safety warning, printed in two extinct languages, barely visible on the side of a grid fin.

"Well in you get," said Cusher.

"Uh...I didn't think I'd be allowed," said Granth, "What is it?"

"Diathermy: standard surgical instrument since the 21st Century. It's just bigger—and mounted on a spaceship." Granth nodded, trying to look enthusiastic at the prospect of climbing inside a surgical instrument.

"So what are you going to do with it?"

"The plan!" said Cusher, "We'll just resect whatever's causing the problem." He smiled with childish glee. "Leviathanic patients have good survival rates."

"Even so, you don't know what the problem is?"

"Not precisely," admitted Cusher, "The main disadvantage of seismic refraction imaging is that it suffers from notoriously low resolution." He scratched his head.

"See, it depends on the number of impactors and seismographs you're able to cover the patient with. We don't have as many to hand as—"

"How many do you have?" Granth was now scribbling in an e-notebook. Cusher eyed it with a vague sense of contempt.

"There are never enough but if..." he trailed off. Cusher rubbed his neck. "The truth is, leviathanic patients are a challenge even for the imaging system we designed specifically for them."

Granth stood quietly in reflection, until the elevator behind pinged with news of an arrival.

"Is that Dr. Arvo?" asked Cusher, "He's always bloody late." He grinned as the doors unfolded. "So glad you could make it!"

"I'm sorry, I missed th—"

"I'll forgive you if you stop talking immediately and get in the ship."

Arvo scrambled up the gangway without hesitation. Cusher turned towards Granth and indicated that he should follow.

"You too, tempus fugit," he said, "She's called *God's Scalpel*— just had the engine renovated. I've had her for twenty years and she still performs as if she's fresh off the assembly line."

A look of complete reassurance tried with some difficulty to secure a hold on Granth's face. Cusher didn't seem to notice Granth's trepidation and ushered him on board anyway.

Fantastic Voyage

The stomach lining: a mosaic of iron-flecked basalt and mucosal flesh. True to anatomical fashion, it took the appearance of some culinary disaster; a stew of raw brisket; incinerated potatoes; putrefied cauliflower; nowhere near enough gravy. Neither was this a spaceship-friendly zone: asteroids floated by in the microgravity of space.

"Please..." Arvo clutched the joysticks, "I'm t-trying to concentrate."

The occasional asteroid collision threw off violent showers of debris in all directions—mechanical digestion on a grand scale. In Arvo's mind, the margin of error seemed to be shrinking, his muscles tense and ready to brace for impact.

"But we need to be faster," objected Cusher, "May I remind you, our patient is still in pain."

"Have you seen the size of those asteroids?"

"I've seen bigger. Move over."

"No thanks," said Arvo, "You'll get us all killed."

Cusher scowled. "It's my ship."

"If you value your ship, you'll leave the controls well alone. Remember—"

Cusher rammed Arvo to the floor. Admiring his handy work with an imperious sense of self-satisfaction, he theatrically wiped his hands and plopped himself on the pilot seat. Granth opened and closed his mouth but could not speak. He was sure this constituted unprofessional behaviour.

"And normal programming is resumed," declared Cusher, as if the normal programming for surgery included rugby-tackling your assistants. Arvo stood up, wiping himself down. He glared at Cusher with dead eyes.

The spleen, he decided— that's what he was going to rip out through Cusher's stupid, irritating mouth.

"What...the...fuck was that," said Arvo.

Cusher concentrated on the asteroid field ahead. Arvo stepped closer, puffing out his chest.

"Mr. Jonathan Harvey Cusher," exclaimed Arvo, "what on earth do you think you're playing at?"

"I warned you," said Cusher, "It's my ship."

Arvo gave a mirthless laugh. "You can't just...bodily assault your colleagues. How old are you? That was the behaviour of a child." Granth was now huddling in the corner.

"Calm d—"

And then the ship lurched sideways into an asteroid. This was experienced by the crew as a sudden change in apparent gravity, followed by an acute onset of pain. Wounded humans groaned. Warped alloys groaned some more.

Finally, dust settled, as dust always does.

Arvo, first to recover, struggled up the incline and clambered onto the pilot seat. He inspected the monitors briskly, fighting to control the tremors of his hands.

Operating with the clarity of adrenaline, he peered outside, which turned out to be a great deal more helpful. The landing

arrangement didn't appear too disastrous once you'd accepted that they had indeed crashed. The damage was mostly superficial— old ships are those that have endured.

Cusher remained slumped on the floor.

"Well?" he asked weakly.

"Eh...no...no damage to the en-engines," stammered Arvo, assessing every parameter twice over, distracting himself from the festering 'what if's. "An oxygen tank's ruptured and...and some of the grid fins have sheared off but otherwise, we're good to...go...I think..."

Cusher watched as Arvo manipulated the controls on his own. In his mind's eye floated the quaint image of a sitting duck, promptly replaced by a blood-splattered asteroid.

"Is it normally like this?" asked Granth, propped against the wall, deathly pale.

"...what?" asked Arvo.

"You know...your day, your job...life?"

Arvo said nothing.

Diagnosing the space whale

God's Scalpel crept onwards, its crew analysing each lesion of interest with the utmost care: verruciform papillae, inflamed diverticula and a glistening forest of metaplastic polyps. Not all such landmarks were strictly biological. The odd metallic glint, for example, might have disclosed an ill-fated freighter scuttled deep within some glandular crypt.

Before long, an expanse of gut wall began to bulge outwards with neat regularity. The bulge enlarged until the way ahead was blocked.

Granth beamed with the joy of discovery. "Is that the tumour then?" This was more entertaining than, say, diabetic foot ulcers.

"I don't think so," said Arvo, applying gentle pressure to the steering joysticks, "It's too well delineated. I'd have expected it to be more malignant-looking given the subacute history." He flicked some overhead switches. "Turning to starboard." Cusher nodded in agreement, biting his tongue.

As the ship swivelled closer, its headlights picked out finer contours. The gut wall was thinner here, more translucent.

"Bubbles!" said Granth, "Behind the wall."

"Well spotted, Granth." Arvo smiled like a proud uncle. "Bubbles imply fluid. I'm sure Mr. Cusher here will explain their importance."

"What?" said Cusher, flustered, "But abdominal fluid accumulation in an Astro-Cetacean typically indicates—"

"Look closer," said Arvo.

The ship's headlights swept over the gut wall, causing each bubble to twinkle like a miniature star. A hint of movement. A blurred outline, like a huge paddle or frond. And then another movement, this time leaving no doubt.

"Amniotic fluid," pronounced Cusher.

Granth gasped. "You mean—"

"Indeed," said Arvo, "Our patient appears to be pregnant."

"An ectopic pregnancy!" Cusher sprang up, gesticulating like a madman. "Not too uncommon even in humans— one in a hundred. I'd say this one has about two months before it's ready for delivery, based on the size of a juvenile Astro-Cetacean I treated a while back, general growth rate, et cetera." Cusher scratched his nose. "It just goes to show: never rely solely on imaging."

"Granth, this as an important lesson for you, remember when—"

"I swear you said Mackorr was male," interrupted Cusher, "Where's the genomic data?"

"...got it here." Arvo sighed, tapping away at the console. "It's encoded in a crystalline matrix, standard pseudo-unicellular."

Cusher leered at the monitors. "And our patient is in pain, Dr. Arvo."

"Yes I'm searching," He tapped away. "I can confirm...this space-whale is a lady." The monitors overhead flashed with a sequence of multi-coloured characters.

"Thanks for that." Cusher scowled. "Why haven't the patient records been updated yet if that information's already on the system?"

"We've been pushing for the genomic data to be linked with the rest of the patient records for years now," said Arvo, "Frankly, we're lucky if the system's even online at all some days. The IT here is useless."

Cusher snorted. "Well, the IT in the humanoid wards seems perfectly fine."

"With respect, the humanoid wards bring in more money to the hospital than we do and hence receive s-s-superior maintenance services." Arvo clenched his fists, readying for a well-worn argument. "The leviathanic wards are *always* being overlooked. If you ask me, we're heading for a major crisis if—"

"Alright I'm sorry, I understand," said Cusher, cutting him off, "But we do need to leave now. I'll take over—" Arvo looked mystified for a moment. "—so that you can book the translator for when we return."

Patient-Centered Care

A startling galactic vista festooned with the twinkling lights of passing star-ships, mostly ambulances and hearses. A hunched figure silhouetted against the window— an elderly lady cloaked in sapphire fur. She was unpacking a travel case full of bio-psycho-socio-electronics. Granth tried not to watch as Cusher paced up and down, mumbling about radio waves and sticky tape.

"Jonathan, would you come over here please?"

"Finally," said Cusher, "how long—"

"Don't be rude now or I'll tell your poor mother."

"Uh...sorry. Also, I prefer 'Mr. Cusher' in front of medical students."

"I'll call you whatever I like," she snapped, enjoying the smile this elicited on Granth's face, "Now speak into this transceiver."

He brought the microphone close to his mouth.

"Mackorr Shel-Khessed?"

There was for a while nothing but the discouraging hiss of static, before a voice condensed from the buzzing. It was deep, husky and unmistakably feminine, but with a robotic

twinge that served to remind the listener this tone was purely an artefact of translation.

"I PREVIOUSLY REQUESTED THAT MY SHOULDER-CITY BE CONSULTED IN THE EVENT OF A DECISION-MAKING PROCESS."

Cusher was visibly taken aback by this scolding.

"I'm sorry for disturbing you," he said, "We went inside and had a look today. The good news— I think— is that you're pregnant."

Cusher glanced at the lady in blue for a sign of reassurance. He did not receive any.

"AND THE BAD NEWS?"

"The foetus has implanted near your pancreas and is compressing an important duct, which is causing your symptoms."

"WELL CAN IT NOT BE RE-IMPLANTED IN THE APPROPRIATE PLACE?"

She was paying attention. Cusher relaxed a little.

"It'll be safer if we surgically deliver it ourselves," he said, "once it's grown enough that is, which will be in about two months."

Cusher stopped to think. Should he ask her now? It was worth a try.

"I hope you don't mind if I ask a quick question. The council of your...shoulder-city...informed us you were male. Why don't—"

"I NEVER TALK TO THEM," she boomed, "THEIR PURPOSE IS SOLELY THAT OF COMMUNICATION."

"Sorry, I don't quite follow."

"THEY ARE IN A BETTER MENTAL STATE TO COMMUNICATE WITH OTHER HUMANOIDS. THIS IS SOMETIMES USEFUL TO ME."

Cusher's jaw dropped. Had she just insulted his

intelligence?

"...Let's talk about the pregnancy again," he said, wrenching the conversation into a more familiar shape, "You've got two options. The first is termination of pregnancy. The second is that we give you pain-killers and then see you back here in two months' time to deliver the baby. Which will—"

"SECOND. DO NOT BOTHER ME AGAIN."

The crackles from the radio fell dead. Cusher, looking faintly surprised, turned to the translator and offered his opinion of the conversation.

"Was it something I said? I thought they'd got her pain under control now. Bit of a misery, wasn't she."

She slammed her travel case shut.

"On one hand, yes, but on the other hand, I'm willing to bet that if your ancestors had been hunted almost to extinction by humanoids, you'd also be a 'bit of a misery' around them."

"So if she hates humanoids so much, why does she keep a whole city of them on her back?"

Not for the first time that day, Cusher's words evoked a sneer of disgust. He recognised that this time he deserved it.

"The city she carries is heavily armed," she explained, "Nobody wants to hunt a space-whale that can fight back."

Conflict of Interests

Granth twiddled his thumbs. He had examined each hinge, mapped out the grain of the wood, become intimately familiar with the simple plaque that read 'Consultation Room 2'. The door had confessed its secrets. Now his defences against the rising tide of boredom were all but exhausted. Fortunately, the voices behind the door were growing louder, angrier. Granth listened as they crescendoed into a welcome source of entertainment.

"I took an oath."

Mr. Cusher sounds...distressed, realised Granth. He pressed his ear against the door.

"Our decision is final," said the chairman.

"Can you not ask her to raise the child on the move or something?"

"Mr. Cusher," said the chairman, "Your hospital has no missile defence system. This is not a negotiation."

"You can't just threaten us whenever you like."

An indignant roar vibrated through the walls.

"We demand it! Terminate this pregnancy at once."

Granth struggled to restrain a gasp.

"You can't," pleaded Cusher, "She says she wants to keep it."

"The council has spoken: It would spell disaster for our economy. We must keep moving."

"But she told us herself. We don't defer to you for this decision,"

"The council retains full ownership of this Astro-Cetacean." Granth heard a fist slam against a table. "Its opinion is not of interest. I say again: terminate the pregnancy or we will destroy the foetus ourselves—and your hospital will burn with it."

"I...understand," said Cusher, "I'll have to discuss it with my colleagues first."

"Do not take long."

Granth flinched away from the door just in time to see Cusher storm through.

"The fuckers want it gone," said Cusher, perilously close to the edge of his patience, "Follow me and don't talk." Granth hurried to catch up.

What would you do?

Now we are halfway-through this tale, featuring characters not at all based on real surgeons, consider the following questions:

1. What ethical principles are most relevant here?
2. How would you manage this situation?

Then read on to see how our team will proceed.

Medical students can be useful

They found Dr. Arvo in the staff office, sipping pensively at a cup of tea. As Cusher expounded on the situation, all three lay slouched on sodden couches in deep appreciation of their dilemma.

Arvo spoke first: "You know...the chairman has a point. Astro-Cetacean childcare isn't sustainable while the mother is on the move—not enough energy for both suckling and propulsion."

Cusher clutched his head. "That's not helpful."

"Certainly...and I can see how a long stationary period might devastate the city's economy, and with it, millions of humanoid lives." Arvo paused to sip at his tea. "They extract all of their resources from whatever passes by, you know."

"You can't terminate a pregnancy against a patient's wishes," butted in Cusher.

"I know, but there might—"

"You just can't. It's assault."

Steam from Arvo's tea fogged his glasses. Nobody said anything.

Cusher sat up and rubbed his eyes. "Have you got a plan

then?"

Arvo replied: "Their meetings last for hours."

Granth bolted upright. "Filibustering!" he proclaimed, thrilled by this unfamiliar sensation...of being useful.

"He's good for a medical student, isn't he," said Arvo, who had assumed Granth was distracted by the notice boards. Arvo could barely keep his own attention away from a particularly gruesome poster featuring a parasitic eye worm.

"Told you he was good," said Cusher, wearing a smug look of triumph.

"Well...no you didn't, you said—"

"Two months!" bellowed Cusher, leaping to his feet, "We have two months to waste. We'll offer all sorts of useless treatments; keep them debating day and night." He paced up and down, brimming with renewed purpose. "We can even give them questionnaires to fill in, about quality of life, all kinds of subjective measures, like—"

"What if they realise?" Arvo's anxiety was rising again. "They have warheads."

"We need something larger then." In Cusher's imagination, he was now some gritty military commander discussing tactics with his lieutenants.

"A new law?" suggested Granth.

"A new law," agreed Arvo, causing Granth's confidence to hit the ceiling, "We could tell them...that we can't treat Mackorr until she is legally recognised as a person...within their own constitution, that is."

"You mean she isn't already?" asked Cusher. He collapsed back into his couch. "What do the bastards—"

"Careful."

"Sorry, what do they classify her as then?"

"They don't," said Arvo, "She's not even classed as property, I checked." He stretched both arms out and

yawned. “Think. In any usual circumstances, an individual can claim rights to a piece of land but never the entire planet.”

Cusher nodded, stroking his chin, while Granth, satisfied with his own contributions, returned to staring at the notice boards. He wondered whether an image of a parasitic eye worm was wholly appropriate for reminding staff to wash their hands.

Cusher muttered under his breath, “And then when the baby is born, they’ll destroy us all anyway.”

Arvo turned with mild surprise. “They can’t. They’ll be stuck in one place; have to trade with us to survive.”

Cusher stared blankly.

“But if they kill the baby, they won’t be stuck in one place.”

“I think... they’d injure the mother in the process,” said Arvo, forming his sentences carefully as his mind worked around the problem, “I think they’re bluffing. In fact, by the time the baby is ready to be born, they’ll have to let us deliver it or risk killing the mother anyway.”

Arvo placed his empty mug on the table. He sank back into his couch and relished a conspiracy well schemed.

“So,” said Cusher, “In the meantime, we just have to prevent them from killing us and absconding to another, less ethically inclined, hospital.”

“That’s the plan: filibustering.” Arvo glanced at Granth with fatherly pride.

“You always were better than me at this diplomacy bullsh—uh, business,” said Cusher, his shoulders sagging. He shut his eyes, inhaled, and then quietly so that Granth could not hear, he muttered: “I appreciate your patience with me, Arvy. I really do.”

Missiles

A cold vapour billowed around the base of the missiles. They hissed like rattlesnakes, cantankerous giants towering above both Cusher and the chairman, exuding a bitter, oily stench that inspired one to consider sniffing cyanide as a healthier alternative.

"The council extends its...gratitude for your...services...thus far." The chairman's tones were smooth and velvety. He clasped his hands together in a self-assured manner, adding to Cusher's growing unease.

"We...uh...try our best," said Cusher, "Of course, we—"

"And the council appreciates your...efforts....to ensure the correct legal...framework is in place."

"Thanks...and—"

"Mr. Cusher," said the chairman, projecting his voice across the dimly lit cavern, "How many patients are there in your...hospital?"

Cusher gazed at the nose cone of a missile, imagining the payload locked inside, and the countless millions of debilitated, frail, patients under the hospital's care.

"I'm...not sure...maybe—"

"It would be a shame if a...catastrophe were...to befall them...no?"

The chairman stepped closer. Cusher swallowed, but held his gaze steady.

"Yes, yes, of—"

"Then I am sure you will be pleased to hear," interrupted the chairman, "That...in order to make it easier for you to comply with our...wishes, the council has seen fit to implement a new...pathway of administration."

Cusher raised a fake smile. "That's very—"

"All treatment options will now be adjudged...immediately...by me...without any further need for the council's input."

Cusher froze. His colleagues had expected this but not so prematurely, with still a month remaining. Arvo could not help him now. He would have to agree to the chairman's demands or risk destruction.

"I understand," said Cusher, heart-sickened by every syllable.

He bemoaned the budgets cuts that had robbed the hospital of its disused military defences. The hospital's founders would not have allowed such a situation to arise—a collaborative of idealists who, in the earliest days of colonisation, had renounced all forms of currency to found a planet-wide kibbutz.

Their planetary hospital had been built on goodwill, by benefactors who had wished to spread their humanitarian creed to those who were not human. Extraterrestrial doctors, captivated by idealism, had voyaged from afar to provide medical knowledge of their species. The hospital had soon developed a reputation, especially among civilisations in which healthcare was not free of charge.

Eventually however, the doctors had begun to question

why they should suffer longer working hours, suffer more stress than, say, the waste disposal engineers, just for the same privileges. Both professions were vital to the hospital; both contributed to patient care, they reasoned. And so, more and more doctors had settled instead for less stressful jobs. Before long, the hospital was forced to offer extra privileges for all healthcare workers just to retain their numbers. Privileges begot credits begot currency. Market forces returned.

"Mr. Cusher?" asked the chairman, "You are still listening?"

Those same forces that had made necessary the rationing of healthcare, thought Cusher. He lamented the leviathanic wards and Dr. Arvo's decrepit IT systems.

"Uh...yes...yes I'm thinking," said Cusher.

Forces so powerful they had once made even war redundant. World leaders of old had instead switched to punishing enemies with economic sanctions.

"Then you agree," said the chairman, smiling, "that it is now in your best interests...to terminate the pregnancy."

Such sanctions were certainly easier on the conscience, something possessed by most sentient beings, recalled Cusher. Larger social structures don't survive long without some moral code, or at least, an aversion to murder.

"Mr. Cusher?"

The solution was at last apparent.

"I think not," he replied.

The chairman jolted back, his ceremonial robes brushing the floor.

"A bold move," he said, "but you must recognize—"

Cusher shrugged. He looked as unfazed as it was possible to look under duress.

"Kill us then." Cusher jerked his head in the direction of

the nearest missile. “And your foetal space-whale, although good luck doing that without injuring the mother.”

The chairman’s face contorted in anger.

“There are other hospitals—”

“Off you pop,” interrupted Cusher.

“But first, your hospital will burn—”

“Do it,” said Cusher, “if we mean so little to you.”

And he slipped away, tranquil in spirit, footsteps echoing in his wake. The chairman could not pronounce any judgement, for he knew his battle was lost.

Nuclear Diplomacy

Granth and Dr Arvo stood to attention as Cusher breezed through the doors of the staff office. Neither could help but notice the sly smile that had no right to be on Cusher's face.

Upon request, Cusher relayed an executive summary: "I told them where they could shove their dumb missiles." He laughed and turned to the notice board. To Cusher's dismay, his parasitic eye worm poster had been removed.

"You said what?" asked Arvo, initially horrified but slowly realising. "You told them...oh...I see."

What Arvo realised was this: the chairman's bluff had been called, and as Cusher had calculated, it had not been a double-bluff, but a bluff of the regular kind. The chairman could not risk the health of the space-whale, which must therefore remain stationary. Even better, the necessary trade partnership to come would benefit both the hospital and the chairman's city alike.

After Arvo had explained this to Granth, he arose and placed his hands firmly on Cusher's shoulders, trying but failing to be portentous. Both men looked each other in the eye. "Don't ever try that again," said Arvo.

"You're the one who taught me diplomacy, Arvy."

Arvo sniffed. "I clearly have a lot more to teach you." He turned now to Granth. "And as for you, young student, you can go home early. You've earned it."

"No he—" began Cusher, before noticing Arvo's disapproval. "Goodbye Granth," he finished. Granth bowed and exited the room, sensing the warmth in Cusher's farewell even if nobody else did.

"I'll head out too," said Arvo, "Got another patient to see before my shift ends." They embraced and then Arvo too left the room, leaving Cusher alone to ponder the consequences of his decisions and the nascent trade partnership.

Such a partnership was unprecedented. Cusher had never before affected so many lives all at once with such immediacy. His own short lifespan was insignificant against even the city's longevity— centuries of riding a leviathan. Yet he had been privileged enough to make this historic difference.

And Surgeon-General Mr. Cusher reflected thus: I was only born yesterday.

Surviving Nix-47

Turning 1

The giant toad stinks. You also stink. But on the boggy forest planet of Nix-47, nobody can afford to waste clean water on luxuries like showering. As the expedition doctor, you've observed the effects of dehydration many times. And so you and your entourage plod on through the sickly haze of sweat and body odour, until your toad steed grinds to a halt. It hasn't broken down; it's stopped to eye up a nest of ant-like creatures. Before you've had time to berate the alien beast for its greed, one of the native Nixeans is down below, scraping slime from its belly with a spatula.

1. To ask what he's doing, go to Turning 2.
2. To knock the spatula from his hand, go to Turning 3.
3. To shout at your carrier toad, go to Turning 4.

Turning 2

"Excuse me," you say, "Why are you collecting that toad's protective mucus?"

He explains in broken English that the slime is precious and may be consumed as a medicine for many diseases. He licks the spatula, and nods approvingly. You are uncertain whether the Nixeans have a notion of germ theory, but you know Nix-47 hosts as many viruses and bacteria-like micro-organisms as your home planet.

1. To advise him not to eat the toad slime, go to Turning 5.
2. To dismount your toad and take a break, go to Turning 6.
3. To ask for a taste of the slime, go to Turning 7.

Turning 3

You swipe the spatula from his hand. “Don’t lick that! You’ll get a nasty virus!”

A frown ripples across his face, and you immediately regret your decision. At once, a burst of Nixean curses spring from his mouth and, with your limited proficiency of the language, you interpret a threat to ram the spatula into one of your orifices and move it back and forth at great speed. He lunges, knocking you from your toad. You fall on your outstretched hand.

Go to Turning 19.

Turning 4

You verbally abuse your carrier toad.

It doesn't understand English, because it's a toad, and even Nixean toads struggle with the fine points of grammar. However, you do manage to startle the dozy creature, and it throws you to the floor, before hopping away. Luckily, you execute an acrobatic roll and avoid injury.

A cloud of soil and grit was thrown into your eyes in the process. This is a thoroughly unpleasant feeling. One of your colleagues runs to your assistance. She asks whether you require help.

1. To ask her to carefully wipe the mud from your eyes, go to Turning 8.
2. To ask her to irrigate your eyes with water, go to Turning 9.
3. To defer treatment and continue your journey, go to Turning 10.

Turning 5

You advise him not to eat the slime, warning him about the threat of disease. He is at first reluctant to heed your advice, but you state that many people have died from 'corrupted slime' and he eventually concedes. You cannot tell whether he is normally this easy to influence, or whether he wasn't particularly hungry in the first place. You now notice the rest of your group are dismounting their toads so you follow suit. The toads seem pleased about this and immediately fall asleep.

Go to Turning 6.

Turning 6

Both suns are setting. Your companions pitch their tents on the only patch of dry land they can find, and as the last glimmer of daylight fades, you revel in the sight of your campfire sending embers sprawling skywards. In an atmosphere of 32% oxygen, you wonder whether a campfire is necessarily advisable, but you'd rather start a forest fire than an argument with your hosts. Tonight, you will dine on wholesome rat-worm stew. Or at least, the stew will be made from a whole and some of a rat-worm. However, you are concerned it may not be sufficiently cooked.

1. To eat the rat-worm stew, go to Turning 11.
2. To choose the luminescent moss curry, go to Turning 12.
3. To eat nothing, go to Turning 13.

Turning 7

You ask for a taste of toad slime. Your Nixean friend is happy to oblige.

It tastes rich and velvety with aromas of ripe blackberries, dark cherries, and a hint of three-day-old trout. You also detect layers of fresh pine, furious osprey, and a touch of toasted almond. A subtle acidity leads to a lingering, smooth finish, like the drawn-out cry of a torture victim. Serving recommendation: pair with rat-worm stew, worm-rat stew, or a quiet evening by the campfire.

Two days later, you become feverish and struggle to breath. Other symptoms include a non-productive cough and muscle aches. You suspect some kind of respiratory infection, but urge yourself to include the more common illnesses on your list of differentials, such as a bad night's sleep.

1. To take high-dose corticosteroids, go to Turning 14.
2. To take amoxicillin, go to Turning 20.
3. To wait and do nothing, go to Turning 15.
4. To use your satellite phone to call for help, go to Turning 16.

Turning 8

You ask her to carefully rub the dirt from your eyes.

She tries, but it's agonising and some particles of grit remain. You decide to flush your eyes with water, which fixes the problem. You worry that your corneas have been abraded. However, you have no choice but to continue your journey. The transport shuttle is not round the corner.

Go to Turning 17.

Turning 9

She irrigates your eyes with cool water, producing an immediate improvement. The pain is gone and your vision is restored. You now notice the day is ending and realise how exhausted you are from the day's travel. Everybody is dismounting their toads, which pleases the toads greatly. They collapse into a slimy heap, making resentful croaking noises.

Go to Turning 6.

Turning 10

You open your eyes and decide to ignore the itching and the pain, but you cannot bear it for long and soon flush your eyes with water. Be advised: blind stubbornness is not often a survival trait. You continue your journey.

Go to Turning 17.

Turning 11

The rat-worm stew is not delicious, but it's edible in the same way anything in a foraging guide is edible— if you cook it for three hours, it'll taste like cardboard but it won't immediately kill you. You still go to bed with a grumbling stomach. At least your packet of loperamide remains untouched. The forest air is warm and humid but you soon fall asleep to the dying crackles of the campfire. Unfortunately, you are woken at twilight by a howl of pain.

Go to Turning 18.

Turning 12

You choose the luminescent moss curry.

The rich blend of herbs and spices makes this a pleasant meal, and the ethereal blue glow from its bio-luminescence makes it a pleasant meal for the eyes too. You go to bed feeling content and fall asleep dreaming of giant newt-like beasts and alien treasures. Unfortunately, you are woken at twilight by a howl of pain.

Go to Turning 18.

Turning 13

You eat nothing.

This elicits cold stares from your Nixean colleagues, deeply offended by your rejection of their food offerings. Quiet grumblings grab your attention. The tumult grows until an angry Nixean jolts upright and charges at you. You dodge him, but he knocks you to the floor and you fall onto your outstretched hand.

Should've practised your judo.

Go to Turning 19.

Turning 14

You take high-dose corticosteroids.

The infection continues to worsen. You're gasping for breath and have difficulty sleeping. Eventually, you become critically ill and somebody calls for help using the satellite phone. If you were conscious enough to think things through, you might've wondered whether suppressing your immune system in the midst of infection was a wise decision. However, you soon begin to slip away into a deep sleep, and step by festinating step, shuffle off your mortal coil. For you, help did not arrive soon enough.

Your life is now over.

Turning 15

You forgo treatment, taking advantage of the physician's oldest remedy: the passage of time.

The infection continues to worsen until you are having trouble sleeping at night. There is no high-flow oxygen this many light-years from Earth. You resolve to sit it out and wait for your immune system to rise to the challenge.

Go to Turning 21.

Turning 16

You call for help.

This results in the end of your mission. On the bright side, you are now back onboard your star-ship and nestling in the medical bay, and you make an uneventful recovery. The doctors inform you there was nothing to worry about, but you never mentioned the toad slime. Maybe the doctors are correct, or maybe they saved your life.

You survived, but your expedition ended prematurely. However, you have no regrets. You feel blessed to have experienced such culinary perfection, such toady taste-bud delight. You also feel cursed, for you will never taste the toad slime again, and will forever yearn for one more lick.

Turning 17

You continue your journey. The going is tough and your eyes sting from the muddy insult. It feels as though there are foreign bodies in your eyes. They water incessantly now, and you constantly wish you had flushed them with water sooner. The pain worsens until you cannot bear to open your eyes. It is intense and gritty, fiery hot, and your streaming tears gum your eyelids shut. The pain stops you sleeping at night, and so you decide to call for help using the satellite phone.

In your star-ship's medical bay, an ophthalmologist diagnoses you with bilateral corneal ulceration and treats you accordingly. Your recovery is uneventful.

You survived, but your expedition ended prematurely. Also, you are now intolerant of contact lenses, and spectacles don't suit you.

Turning 18

You step out to investigate.

It transpires that one of your colleagues had gone outside to void his bladder. He had chosen a large rock for target practice but had discovered the underside of the rock was occupied. And so it came to pass that he was stung by this planet's equivalent of a scorpion. So successful a design is the arthropod body-plan that scorpions have evolved independently on many planets besides Earth.

You inspect the site of envenomation. It is a red, punctate lesion on his left ankle, surrounded by a wide circle of redness. He denies having difficulty breathing, but is clearly in pain. Out of habit, you ask whether he caught the scorpion so you can select the appropriate anti-venom, but he says it fled.

You don't possess any anti-venom.

Fortunately, the man describes huge pincers, and you know the larger the pincers, the weaker the venom. You therefore treat the lesion as one might treat any other abrasion.

The next morning, the man complains to you about new-

onset pain.

1. To ask more about the pain, go to Turning 22.
2. To examine his abdomen, got to Turning 23.
3. To ask about his diet, go to Turning 24.

Turning 19

Your right forearm is extremely painful.

On examination, the wrist is red, swollen and deformed. The skin isn't broken, and there is no numbness or tingling in your fingers. The radial pulse is palpable.

1. To use the satellite phone to call for help, go to Turning 25.
2. To splint gently from the elbow to the wrist, go to Turning 26.
3. To place the arm in a sling, go to Turning 27.

Turning 20

You take amoxicillin.

However, the infection continues to worsen. In hindsight, you don't know if you are even suffering from a bacterial infection. You also have no reason to believe any of this planet's bacteria would be susceptible to a penicillin-class antibiotic. It's true that convergent evolution certainly makes feasible the independent evolution of the same enzymes, the same drug targets, on different planets, but trying penicillin this far from Earth is pushing your luck even so. You find it increasingly difficult to breathe and hope your immune system is up to the job.

Go to Turning 21.

Turning 21

You stay bed-bound and short of breath for the next week, but the Nixeans are kind and hospitable. They keep you well nourished and comfortable. Soon the infection wanes and you feel stronger and happier. You know it is time to go soon. In celebration of your recovery, the Nixeans take it upon themselves to prepare a special feast.

Go to Turning 6.

Turning 22

The man describes an epigastric pain that came on suddenly this morning. It has been gradually increasing over the past hour, and is now severe enough to induce nausea and occasional vomiting so you give him oral morphine with cyclizine. The pain radiates to his back. Past medical history is unremarkable. He does not smoke tobacco or drink alcohol, as neither can be cultivated on this planet.

1. To examine his abdomen, go to Turning 23.
2. To advise bed rest and peppermint tea, go to Turning 35.
3. To give 0.9% saline and mark the patient as nil by mouth, go to Turning 28
4. To give cefuroxime and metronidazole, go to Turning 29.
5. To use the satellite phone to call for help, go to Turning 30.

Turning 23

On examination, you note the absence of jaundice. The epigastric region is tender to palpation and there is a reddish brown discolouration around the flanks. Also, you note guarding in the upper abdomen. On auscultation, bowel sounds are diminished. Observations show that the patient is febrile and tachycardic.

1. To advise bed rest and peppermint tea, go to Turning 35.
2. To give cefuroxime and metronidazole, go to Turning 29.
3. To give 0.9% saline and mark the patient as nil by mouth, go to Turning 28.
4. To use the satellite phone to call for help, go to Turning 30.

Turning 24

The patient eats mostly insects, soup made from carnivorous squash-like vegetables, and some kind of ochre-coloured root. This has not changed recently, nor has it changed in the last hundred years since their ancestors colonised this planet, you are haughtily informed. The patient hasn't lost weight, and reports no recent change in bowel movements, except for a spout of diarrhoea this morning.

At this point, he clutches his stomach in agony and vomits, during which you note its normal composition (no blood, bile or faeces). He wipes residual strings of gunk from the corners of his mouth and demands immediate medical treatment, preferably in the form of toad slime. You tell him you have none left, but you will give him something more effective instead.

1. To advise bed rest and peppermint tea, go to Turning 35.
2. To give cefuroxime and metronidazole, go to Turning 29.
3. To give 0.9% saline and mark the patient as nil by mouth, go to Turning 28.
4. To use the satellite phone to call for help, go to Turning 30.

Turning 25

You call for help.

Welcome to your star-ship's medical bay. A radiograph soon demonstrates a Colle's fracture, for which you are referred to orthopaedics. Unfortunately, your lack of appropriate pre-hospital care has resulted in complications that will extend the healing time and confer an increased risk of osteoarthritis in the future.

You have survived, but your journey ended prematurely and your wrist was injured. At least you have another.

Turning 26

You splint your wrist.

Having checked that you can still move your fingers, and that the radial pulse is still palpable, you take a triangular bandage from your rucksack and form a sling to immobilise the joint. It's time to make your way back to the transport shuttle, but it is several days away by carrier toad.

1. To call for help by satellite phone, go to Turning 31.
2. To journey by toad, go to Turning 32.

Turning 27

You form a sling with a triangular bandage but the joint isn't fully immobilised, and so the grinding of the bones within your wrist sickens you with every jolt. Ask yourself why you chose this course of action— do you enjoy pain? It's time to return to your star-ship, so you use your satellite phone to call for help.

Go to Turning 25.

Turning 28

You infuse 0.9% saline intravenously, then advise him not to eat anything for the time being. You also provide more analgesia. Half an hour later, you notice a definite improvement. The inflammatory process is clearly diminishing. You diagnose acute pancreatitis secondary to scorpion toxin, and use the satellite phone to call for help since the patient has been stabilised. The patient will likely make a full recovery, but it is wiser not to take any risks as the condition can be fatal. You know he will be safer onboard your star-ship. After all, its medical bay is staffed by a doctor from every speciality.

It is your last night with the Nixeans, and they wish to thank you for your help. They hold a feast in your honour.

Well done! You survived your away-mission and have increased your standing among the Nixeans. This will make stealing their planet's resources much easier. Your star-ship's commander accelerates all mining operations and appoints you as Nixean ambassador.

Turning 29

You cannulate the patient and infuse cefuroxime and metronidazole.

Unfortunately, the pain continues to worsen. Half an hour later, you check the patient's blood pressure: it has dropped to 90/60 mmHg. Capillary refill time is greater than two seconds. He is complaining that he feels cold.

Now ask yourself: why would antibiotics designed to kill Earth-borne bacteria be effective for an alien disease?

1. To offer milk infused with lemon and honey, go to Turning 33.
2. To give 0.9% saline, go to Turning 34.
3. To use the satellite phone to call for help. Go to Turning 30.

Turning 30

You call for help.

Unfortunately, the patient is deteriorating because he hasn't been managed appropriately. The reason for this is clear: their doctor isn't very good. He goes into severe hypovolaemic shock and is dead before help can arrive. Post-mortem examination reveals that the cause was acute pancreatitis— a treatable condition.

The Nixeans commit his body to the bog, hold a long period of mourning, and spurn your company. And so you return to your star-ship, dejected and miserable, for you have failed your friends. To add insult to injury, your line manager advises you to seek a refund from your medical school.

Turning 31

You call for help and are taken back to your star-ship's medical bay, where a radiograph reveals a Smith's fracture. This is unsurprising. You are treated accordingly and make an uneventful recovery.

Well done, you survived, and although your mission ended prematurely, at least you came away without serious injury. From this experience, you have obtained the dullest anecdote, and nobody wants to talk to you at parties anymore.

Turning 32

You ride your trusty toad back to your transport shuttle. This takes a week during which you quickly regret your decision. However, you feel content with your own determination. You're a fighter!

Time to go. You steer the shuttle back towards your starship and pay a visit to the medical bay, where a radiograph reveals a Barton's fracture. Unfortunately, the fractured bones were misaligned. They have now fused, meaning that you will need surgery and a long period of recovery.

You survived, but your mission ended prematurely and you have seriously injured your wrist. At least you have another.

Turning 33

You give the patient a glass of milk infused with milk and honey, and wait for it to start working.

This has no effect. The patient deteriorates further and soon slips into unconsciousness. You call for help, but the patient is dead before help can arrive. The Nixeans commit their friend's body to the eternal bog as soon as possible, so as to ritually preserve the corpse.

In addition, they hold a long period of mourning and spurn your company. And so you return to your star-ship, dejected and miserable, for you have failed your friends. Worse, you have brought the medical profession into disrepute for denying the magical healing properties of toad slime.

Turning 34

You infuse 0.9% saline intravenously.

The patient's condition gradually improves and so you judge it time to call for help. The patient is thus taken to the medical bay on your star-ship, diagnosed with acute pancreatitis, and treated accordingly. Luckily, they make a full recovery.

Well done, you treated the patient successfully. However, the Nixeans no longer trust you because of your rejection of the medicinal properties of toad slime. While they don't openly disrespect you, many are now spurning your presence. And so you complete your mission and return to the star-ship, upset to have lost your friends. Worse, the star-ship's doctors force you to foot the bill for treating the ill Nixean.

Turning 35

You tell the patient that they just have a 'minor stomach bug'; nothing that some rest and peppermint tea won't cure.

The patient listens to your advice, but their condition doesn't improve. Instead, the patient soon goes into hypovolaemic shock and passes away. The Nixeans commit the body of their friend to the bog that evening, so as to ritually preserve the corpse.

Shaken by your failure, you exile yourself to a desolate cave and live as a hermit. Your star-ship's crew leaves you for dead and continues onwards. For years, you occasionally wonder what could have gone wrong, and then one day, you realise: acute pancreatitis secondary to scorpion toxin.

It is time for you to hale a passing star-cruiser and return to your civilisation. Go back to the start and try again.

Limitations

Part 1

To my great disappointment, I remained unmauled by a vicious alien monster.

Steve thought aloud: "Could be cataplexy, or a tonic immobility..."

I continued to agitate the boulder-shaped being, exploring its surface, but the thick rubber gloves of the biosafety cabinet restricted my efforts. And yet I could vaguely feel a craggy texture emerging.

"Ridges," I said, "I think...might these be segments?"

"Could be, Sue, could be." He twiddled his thumbs.

My frustration was building now. "You know," I began, "maybe we should try—"

Steve wasn't listening. "Switch off the lights," he said, struck by epiphany. I withdrew my hands and did as instructed. Our eyes soon adapted to the darkness.

Having spent three years vaccinating children in the slums of Karachi, and a further seven years hunting lethal viruses throughout southern Africa, I'd never thought anything could surprise me. I'd thought of myself as a 'woman of the world'. Suffice it to say, this creature was precisely the

opposite.

The boulder...reconfigured, unfurled, squealing like a deflated balloon.

Steve chuckled to himself. I swear the man had no fear. "Mmm...I thought it'd be arthropod-like," he mused, before addressing the xenobiote as follows: "You're basically just a big woodlouse, aren't you."

I can't recall whether I was more annoyed at myself for missing that light trick, or at Steve for referring to the most important discovery in history as 'basically just a big woodlouse'. It didn't look remotely like a woodlouse. Unlike a woodlouse, it was also curiously...immobile.

"We've established it hates light then," I said, "But why?"

"Eyes," he replied without pause, "Probably. Think anglerfish."

Without further elaboration, Steve fetched a tangled, wiry instrument from a cupboard labelled 'Diagnostics'.

"Plastics are okay in fluorine, right?" he asked.

I nodded; whereupon he passed the instrument through the cabinet's airlock, and grasped it with the cabinet's gloves. He pressed the instrument onto the xenobiote's presumed head.

"Ultrasound probe," he explained.

We peered at the overhead monitor, interpreting the monochromatic images as best we could. They showed a tubular cavity extending deep into the xenobiote's head. This cavity hosted an array of concave discs, culminating in a single lenticular structure that prefaced a pit in the side-wall.

"That's an eye alright," said Steve. He proceeded to scan the whole head, counting two of them. "Windows to the soul," he whispered.

Part 2

"It's very long for an eye," I pointed out, "Be careful."

"This arrangement," said Steve, "It reminds me of...a telescope."

"Astronomers certainly hate the daylight. That's for sure—"

He shushed me so as not to derail his thoughts.

"Notice...notice how he let me prod his eyes." Steve scratched his bald patch. "He's verschlafen, he is."

I stared into those dusky orbs, cold alien eyes as captivating as gemstones. My distorted reflection stared back. I looked old and haggard.

"It's barely twitching," I agreed, forcing myself to refocus.

Steve meanwhile had advanced to probing whatever passed for the creature's thorax. The ultrasound images overhead flickered and twisted in kaleidoscopic turmoil, until they at last settled on a pulsating clump.

"At least we have a life-sign to monitor now," he said.

And a life-sign it surely was, for those frenzied, rhythmic contractions would put anyone in mind of a beating heart.

"It's almost certainly not a heart," continued Steve, "at

least, not in the classical sense."

Well, I'm not a vet.

"Sue! Didn't you spot the lack of vessels?" My facial expression had betrayed me. "His circulatory system seems closer to that of Earth-bound arthropods," he explained, "I think it's haemolymph-based...which is...meshugge, it is."

"I'm a doctor," I replied, "not a vet."

"Haemolymph is...kind of like blood," he said, "except it isn't confined to any vessels. The whole body is both the vessel and the pump—an open-ended system."

I eyed the xenobiote with suspicion.

"What's so ludicrous then?" I asked.

"Ahh It's...bupkes for transporting gases," he said, "Big brains require lots of energy, and therefore lots of oxygen, which is why we've got a closed circulation instead. Of course—wait."

Steve cocked his head, as if unsettled.

He listened, heard nothing, and continued: "Sorry. Uh...I'm no physicist, but you'd think interstellar travel requires a ton of brainpower, right?"

"Perhaps we're all just bumbling fools," I said, setting Steve guffawing in the hearty manner that only an authentically overweight person can hope to achieve.

"Maybe we are, Sue," he agreed, "Maybe we—there it is again."

I now heard it too: a low rumble emanating from within the cabinet, growing steadily in volume. The creature's limbs vibrated in peculiar resonance. And then its head erupted.

Splayed mandibles sucked at the cabinet's walls, displaying countless rounded nubs of what might have been teeth. Steve recuperated without trouble, whereas I had wet myself in dramatic fashion; your bladder isn't the same after you've given birth to three kids.

"Didn't expect that," said Steve, oblivious to my trouser situation, "Wonder what triggered it."

"Who knows," I muttered, before excusing myself for a change of clothing. In my defence, I'd desperately needed some time to myself. It was a lot for one person to process.

I don't remember how long I was gone for, but when I returned, the corridors were blocked off.

"I'm sorry ma'am," said the security officer, planting himself before me in the typical stance of the blue-collar Rambo, "The holding laboratory is strictly out of bounds."

"Dr Lederbern, microbiology registrar." I proffered my badge. "I only went for a toilet break."

"Ma'am, there's been an incident," he explained, "I'm afraid I can no longer permit you access."

My heart skipped a beat. "What's happened?" I asked, feeling the fear creeping in, "Is Steve okay?"

"Ma'am, I..."

His hesitation only served to worsen my anxiety.

"You'll tell me right this second," I yelled, "or so help me—"

"Ma'am!" he cut me short, "I'm sorry. Dr Maimon has passed away."

Any rage fizzled out in a second.

"Look ma'am, there was a fluorine leak," he continued now with a gentler tone, "I'm afraid you can't come in here anymore, for your own safety."

The rest you probably know. It transpired that the xenobiote had indeed penetrated the cabinet's walls in its failed attempt to escape, thus killing itself by deprivation of atmosphere. The CCTV revealed that Steve had even smelt the initial tang of that lethal fluorine gas, but had attributed it to his own flatulence. He was a comedian until the very end. I shall always remember him for his remarkable intelligence,

but not least for the warmth of his smile—the warmest I've ever—

Part 3

I stared into those dusky orbs, cold alien eyes as serene as a full moon. My reflection stared back. I looked disconcertingly youthful.

"It isn't too alert," I agreed, forcing myself to refocus.

"But we've tried prodding him." Steve scowled. "For whatever reason, he's keeping shtum."

I placed my hands on my hips. "You're expecting communication? It might not—"

And at once, those alien eyes began to twinkle like the glint of moonlight on broken glass. The contrasting silence was eerie.

"—even have...a voice," I finished, half-dazed by the xenobiote's awakening. The flashing of its eyes continued, too rapidly for us to distinguish a pattern.

"Well!" said Steve, whose face had lit up with intense happiness, "Would you look at that..."

It had taken time, but Steve had finally caved into the xenobiote's wonders.

"Congratulations," I said, wearing my most sardonic smile, "Your woodlouse can talk."

"Sue, you putz. He must use mirrors in those telescopes, not just for receiving messages of light, but for sending them too."

My face must also have lit up once I'd understood the dual purpose of those eyes, if eyes they could still be called.

"I take it...there must be an internal light source," I inferred, my brain creaking back into gear, "for shining onto those mirrors?"

Steve nodded. "Bioluminescene. Think glow-worms. At least—" His smile warped into a look of disgust. "Oy gevalt..."

Steve recoiled, but if this was the creature's defence mechanism, it would surely have been aimed at him. The thick pearly concoction was instead aimed at the floor, and we hence judged it to be vomit. The limbs had gone into spasm too, adding to the general semblance of illness.

"If that were a human," I said, "I'd diagnose severe electrolyte disturbances."

"If that were a dog," said Steve, "Yep...I'd say the poor bugger's completely fercockt."

In retrospect, this was the first sign that the xenobiote was ill.

We halted our investigations, but for Dr Karen Buck, our resident chemist and rowdy American to boot, the sample of xenobiotic vomit was a gift from God. Kaz and I had been working on the creature's biochemistry from the start—my job had been to culture xenobiotic cells and send her the samples. Upon my entrance into her lab, she handed me a beaker of white powder and smiled expectantly.

I waited. The clock on the wall ticked, ticked.

"Calcium fluoride," she announced, grinning like an idiot.

"So what if it is?" I asked, holding the beaker up to the light. The powder remained dull and uninteresting.

"I'd, like, totally suspected calcium was the halide ion accepter," she said, almost jumping with excitement. I won't say 'explained' because it meant nothing to me. I handed back the beaker of powder.

"Kaz, calm yourself. First, can you explain why it's vomiting this stuff?"

"For sure!" She brushed fluorescent pink hair from her eyes. "Calcium fluoride is, like, you know, insoluble in anythin' that doesn't contain oxygen, which nothin' in a fluorine atmosphere can, because oxides would react away instantly."

"So this vomit is...what?" I said, "Precipitating out of it fluids, like kidney stones from urine?"

She nodded. "And we can fix it?" I asked.

Kaz shrugged. "Dunno."

The clock was still ticking. I decided to underline our urgency: "Listen Kaz, we need—"

"I hear you," she cut me off, "Imma tell you what I got so far." She gestured towards her whiteboard, on which had since been scribbled more chemical reactions:

1) $SiC + 2F_2 \rightarrow CF_4 + Si$
2) $CF_4 + Si + 2CaCl_2 \rightarrow 2CaF_2 + SiCl_4 + C$
3) $C + 2F_2 \rightarrow CF_4$

"I've broken down our original respiratory equivalent into three steps," she explained, "Check out the middle one."

I read off the board: "Calcium chloride...gets turned into calcium fluoride?"

Kaz smiled. "Fluorine is, wow like, extremely reactive, so it forms strong bonds with almost anythin'. Calcium chloride can help break those bonds, which is why it's needed here. But in the process, you end up with calcium fluoride." She pointed to the contents of her beaker. "...which you can only split up usin' oxides, which, as I said, can't exist in a fluorine

atmosphere...so yeah...bit of a bummer."

In other words, we had a legitimate problem, and since we didn't yet understand 'normal', we couldn't possibly comment on 'abnormal'. Our problems could therefore be summarised thusly: how did the xenobiote normally succeed in breaking down calcium fluoride?

"So much for chemistry," I muttered.

That throwaway complaint would turn out to be unfortunately prescient, for nothing could—

Part 4

This is the part you'll recognise from the media storm. My woodlouse had managed to crack its enclosure, the very thing keeping it alive, in its attempt to escape. Not his fault, I guess. We narrowly managed to save the dozy thing, but only thanks to Sue.

She'd smelt the fluorine well before me. I'd be dead if it weren't for her quick reactions, and so would my woodlouse. I'll always remember her for her remarkable intelligence, and not least for her sharp wit—she'd never fail to make me laugh. My condolences are forever with her family. Baruch Dayan Ha'Emmes.

Sue's death had shaken us all. It had particularly shaken the powers that be, who, in their infinite wisdom, had now decided the woodlouse was too dangerous to study. They even had the chutzpah to ask me to 'let it go'. I'm the vet. Let me decide. Euthanasia is not a decision I ever take lightly.

If you're thinking, "That's weird. Why would anyone let it just...die?" you wouldn't have been alone. Humanity's first experience with an alien life-form — a wealth of scientific knowledge ripe for the taking.

"Oh, it's too dangerous. Just kill it."

Yeah, right.

I objected, but the schmendricks said they had 'reason to believe' my woodlouse wasn't sapient. He was a dumb test subject, a guinea pig for an experimental form of travel, they said.

If you ask me, I reckon they'd had trouble reverse-engineering the spacecraft. Who knows what they found? They certainly wouldn't tell the likes of me. I was told, "Prove the xenobiote is intelligent enough to make its own decisions, that it's sapient, and we'll reconsider our options."

So, what's the easiest way to prove someone is awake and aware?

Well yes you could hit them. I was going for 'Say hello'.

Back in the holding laboratory, the woodlouse had curled into some kind of dormant state, presumably because of the accident. He seemed to be hibernating, like a lungfish waiting for the monsoon season.

That our woodlouse had evolved such a mechanism for coping with a transient loss of atmosphere was really very interesting. Well, it was to me.

I tapped the glass.

No response. Not entirely unexpected, given the poor transmittance of sound in a thin atmosphere. So, he couldn't hear me. Next sense on the list: sight.

I flashed my penlight into his eyes, just visible within his folded carapace.

My woodlouse unfurled. Success!

Not only that, but his eyes started flashing back. Eyes capable of both transmitting and receiving messages! My hypothesis: parabolic mirrors within those telescope-arrangements, similar to the eyes of scallops. I uttered a quick Shehecheyanu blessing, hoping the Almighty wasn't sick of

them by now.

So I had established humanity's first channel of communication with an alien species. Was that good enough? "Any animal can communicate," they said.

In fairness, this was correct. I needed more.

Fun fact: pencils work in a fluorine atmosphere, or at least, a stick of graphite won't violently explode. I drew a square on the floor of the enclosure.

In response, my woodlouse manipulated the stick of graphite, using some grasper appendage, and scribbled. I don't know what he scribbled, because it was a scribble, but it had a definite structure: a splurge of jagged waveforms punctuated by dots and dashes. To ensure this wasn't a fluke, I drew another square. He repeated the same scribble.

I had discovered the first alien language. Had the Almighty smitten me there and then, Dayenu— it would have been enough. I would have died a happy man. Importantly, it had also been enough to persuade the higher ups that my woodlouse was indeed intelligent. My mistake was in assuming they'd honour their promise.

They locked the 'xenobiote' in an autoclave, a glorified pressure cooker for sterilising medical equipment. Not even tardigrades, the hardiest creatures known to science, can survive an autoclave. He was superheated to death.

Read it and weep: humanity's first encounter with alien life.

I shall never—

Part 5

I flashed my penlight into his eyes, just visible within his folded carapace.

Again, no response. I wasn't expecting that.

Next sense to test? It couldn't be smell—thin atmosphere. So I tried, and this is going to sound cruel but it isn't, electricity. Think sharks.

I zapped the woodlouse with nine volts. It's not much, but if you've ever doubled-dared a friend to lick a battery for a laugh, you probably now have one less friend. Accordingly, the woodlouse unfurled.

If I'm honest, this was probably a pain response. I might even have overdone it, because the woodlouse then projectile vomited all over my gloves. I withdrew my hands at once, swearing like a trooper, and ran my hands under cold water until they were numb.

After I'd calmed down, I realised the mixture hadn't corroded through the gloves at all. It wasn't some defence mechanism akin to that of the bombardier beetle. Besides, it looked like porridge, which is generally considered trustworthy.

What really clinched it were the spasms of those gangly limbs. It couldn't have been shivering to generate heat because any more heat would've boiled the hydrogen fluoride in its cells. A second round of vomiting, not induced by any electric shock, furthered my suspicions of illness.

What would you have done?

Admit it. You said 'Panic', didn't you?

If this were any other patient, I would've sought help from somebody more knowledgeable. Possibly the most profound advice anybody can offer you in the field of veterinary medicine: know thy limitations.

That's all I was doing: seeking a second opinion.

Who was most knowledgeable about this alien species? Answer: a member of the species, of whom I only knew one. I henceforth recommended the woodlouse be returned to the spacecraft. After all, what kind of spacecraft doesn't stock a first-aid kit?

If our sick alien could heal himself, that would be proof of his sapience. If he couldn't, death would surely follow, and the higher ups would have their wishes fulfilled anyhow.

The big shots were reluctant. The debate became heated to the point they threatened to kill the thing rather than let it anywhere near its ship. I called their bluff, claiming it was the only chance we'd have to learn about the ship. Of course, if they'd mentioned the beacon they'd discovered, maybe I would've been more receptive to their arguments, but...they didn't.

So I told my wife I was taking Chester for a walk. That's my terrier.

Saddleworth moor is a bleak expanse of nothing on the edge of Oldham. It was drizzly and overcast that day: a bleached sky hanging above moorland that looked in need of bleaching. It's usually like that during the winter.

As Chester and I approached the crash site, the drizzle lessened and I felt slightly less miserable. Chester seemed happy at least, but caked in mud. I sighed.

Having cleared security, my first view of the spacecraft was obscured by a billowing plastic tent-cover. It was intended to trap the fluorine atmosphere, so the xenobiote could ferret around in its own ship without asphyxiating. I was not impressed. The tent looked a right schmatte, ready to take to the sky at any moment.

Chester decided it was safe and trotted towards an office trailer. 'New personnel report here,' said an accompanying sign, so I let the doggie lead the way.

I was greeted by a beefy woman with too many facial piercings. "Sue told me all about you." She sounded American. I suppressed a grimace.

"I'm not that bad once you get to know me."

She laughed. "Dude, the stories were all nice, I promise."

The girl even wore bright pink nail varnish. My daughter grew out of that when she turned twelve. Kaz won't mind me saying this. After all, is a best friend a best friend if you didn't hate them when you first met?

"I'm Dr Karen Buck. Just call me Kaz," she continued, "Head of the chemistry department here. I hear it was your janky idea to return the xenobiote to its ship."

I awkwardly shook her hand, introducing myself, before confirming it was indeed my 'janky idea'.

"So what now?" I asked.

Kaz wanted me to leave my dog tied to a pole, so I told her where she could shove said pole. Thus persuaded by my trademark tact, Kaz agreed to escort me through to the crashed ship. We fitted our protective suits then stepped inside. Half a dozen soldiers were stationed around the ship's perimeter; their rifles aimed at a boulder in the centre— my

woodlouse.

Our shy little alien had once again assumed foetal position.

I climbed aboard the spacecraft, Kaz keeping an eye on me from afar. I heard her shout something, probably 'Don't touch anything!' or 'Golly! Keep away from that alien, you crazy Brit!', but I couldn't hear properly so I just shouted back 'Sure!'

So picture your classic UFO, a flying saucer twice the size of your average caravan. What I'm allowed to say about the cockpit is that...it had a lot of buttons. It may or may not have had other kinds of user interfaces. But buttons are universally reliable, apparently.

If you're reading this book hoping to find out more about what happened next, I'm sorry. I can only reference the official account:

[12:17] Xenobiote mobilises towards cockpit console.

[12:18] Two buttons pressed by xenobiote. No change detected. Troop B holds fire.

[12:19] Xenobiote shifts to inactive state.

[12:31] Dr Maimon exits containment area.

[12:33] Dr Buck and Dr Maimon depart from Saddleworth site.

[12:47] Second craft materialises. Troop B fire under order of Lt Gen Cottrel.

[12:48] Weapon of unknown mechanism is deployed by second craft. Blast zone radius measured afterwards as six miles, encompassing Dove Stone reservoir. First craft is obliterated. Death toll: 76.

[12:49] Second craft dematerialises.

I won't comment on Lt Gen Cottrel's decisions. As already noted during the inquest, "it's possible the occupants of the second craft intended to deploy their weapons regardless of the human reception". All I will say is that the media's

treatment of the whole affair was despicable. Lt Gen Cottrel deserved the same respect as those other lives sadly taken from us. My condolences are forever with his family and the families of the other victims.

The rest of my story is short, mainly because I was now out of a job. Even a vet can't bring dead animals back to life, and dead the woodlouse certainly was. Nothing survived the blast.

I can't emphasise how tragic—

Part 6

[12:49] Weapon of unknown mechanism is deployed by second craft. Blast zone radius measured afterwards as six miles, encompassing Dove Stone reservoir. First craft is obliterated. Death toll: 81.

[12:50] Second craft dematerialises.

These events were bloody extraordinary, but when I was told about what'd happened after I'd left Saddleworth, I didn't feel shock, despair, or anything sensible for a person in my circumstances. All I felt was an overwhelming sense of déjà vu. I can't explain—

Part 7

Steve looked overjoyed. My face must also have lit up once I'd understood the dual purpose of those eyes, if eyes they could still be called. Then I experienced that dreadful sense of déjà vu again. It was starting to concern me.

"So there's...an internal light source," I inferred, my brain creaking back into gear, "for reflecting off of those mirrors?"

Steve nodded. "Bioluminescene. Think jellyfish."

"...and there'll be a language too?" I asked.

We soon discovered that not only did the xenobiote employ this dynamic 'spoken' language of flashing lights, but also a static language i.e. a system of writing. I'd liken its appearance to an exploded spectrogram.

Steve had taught the xenobiote how to draw with a sharpened stick of graphite. Their brief game of language played out as follows:

Steve drew a square. The xenobiote matched it with a ripple of text, we denoted as T1.

Next, he erased his square and drew a circle, this time matched by a different ripple, denoted T2.

Lastly, Steve drew a square around the circle. One might

now have expected T1 to be mingled with T2 by some deducible rule of syntax e.g. T1 + T2, but instead, the xenobiote offered us another unique block of text, denoted T3.

The punch line: no similarity between T3 and either T1 or T2.

"What do we have then?" Steve threw his hands up in the air. "Gornisht! There's no alphabet."

I glanced at the xenobiote. It seemed to be shivering.

"There might be," I said, "We should request a linguist at the end-of-day briefing."

Saliva dribbled from its jaws, sparkling like fine-grained Caribbean sand. I was swamped by the strongest wave of déjà vu yet, verging on full nausea.

"Steve," I said, "I need to talk to you about something."

He smiled. "About time."

"Yes, I've been experiencing a sense—" Then I hesitated because he was looking overly smug.

"About time," explained Steve, "Something's wrong with time, right?"

I nodded. "So you've been having terrible déjà vu as well".

"It's the language," said Steve, "T1 + T2 doesn't give T3. Could it be interference? Waves? Do they think in waves instead of...discrete numbers?"

His tangents were frustrating at the best of times. "Steve! Do you have any idea what's causing the déjà vu?"

Steve set about rummaging in the diagnostics cupboard. He came up brandishing a blunt, hammer-like tool with a maniacal gleam in his eyes. I stood paralysed with uncertainty, watching him pass the tool through the cabinet's airlock.

"How do you like this!" he shouted.

Veterinary surgeon Dr Maimon proceeded to batter the

xenobiote to death. Before I could stop him, he—

Part 8

His tangents were frustrating at the best of times. “Steve! Do you have any idea what’s causing the déjà —”

That’s the last thing I remember saying before losing consciousness. When I next awoke, Steve was already upright and sipping orange juice. He looked content.

“Morning, Sue,” he said, “You should try the sandwiches. They’re geshmak!”

I glanced down at the sandwiches on my side-table: two sterile triangles of brown bread with no discernible filling. I decided to pass.

“You killed...something.” I massaged my eyes. “No...you didn’t kill anything.”

Steve smirked then handed me a napkin. He’d scribbled a tree diagram on it. Those of you who are physicists will have worked it out by now: the xenobiote was flipping between parallel universes.

“We’re going to need a physicist,” said Steve, “I don’t know exactly how it’s doing it, but you can bet your right leg it involves the word ‘quantum’. That’s probably how we sensed the changes: pretty sure the workings of our neurones

are subject to quantum phenomena."

"Shit," I said, staring straight ahead. I inhaled slowly.

Steve replied instantly: "Yeah quantum consciousness is a bit pseudo-scientific but—"

"That's not what I...never mind, Steve."

We were interrupted by a knock at the door: one of our seniors, who must remain nameless. They announced we were to attend the lab immediately. Instead of being shown to our workplace however, we found ourselves in a dimly lit meeting room devoid of windows. In the discussion that took place, it was revealed to us that the xenobiote had passed away in our absence.

I still remember the look on Steve's face—

Part 9

When I next awoke, Steve was already upright and sipping orange juice. He looked content.

"Morning, Sue," he said, "You should try the sandwiches. They're geshmak!"

I massaged my eyes. "We were in...a meeting room." I didn't need to glance down at the sandwiches. I'd seen them before.

"So you remember too. You've already seen this, I presume."

Steve handed me a napkin on which he'd scribbled a tree diagram.

We passed out.

When I awoke, one of our seniors, who must remain nameless, was standing at the door. I yawned, stretched my arms, and turned towards Steve for an explanation; he had recovered before me again.

"Welcome back, Sue," he said. I'll never forget the look on his face: the snapshot of a man mourning a...beloved pet. "It's not good news, I'm afraid."

I turned back towards our senior, a deep sorrow beginning

to weigh on my mind. I knew what he was about to say, because it had happened in a parallel narrative. That was the creature's defence mechanism, you see: it flipped between universes to optimise its lifespan. We later discovered that individual xenobiotic cells, even in vitro, possessed a rudimentary ability to do much the same. In our seminal publication, we dubbed it 'Biological Quantum Optimisation (BQO)'.

I braced as if for impact, expecting to wake up again and have Steve attempt to persuade me that the sandwiches were delicious, but I stayed curiously upright. I looked Steve in the eyes, and mutual understanding passed between us. Nothing more was going to happen—

Questions

Before we reach the story's conclusion, you now have a chance to beat me to it.

Questions:
1. Which chemical reaction is the cause of the xenobiote's illness? (this has already been revealed)
2. By what mechanism might the xenobiote cell's rectify this issue normally?
3. How might Sue cure the xenobiote of its illness?
4. Should Sue attempt a cure? If not, why not?

Part 10

When I next awoke, Steve was already upright and sipping orange juice. He looked content.

"Morning, Sue," he said, "You should try the sandwiches. They're geshmak!"

I groaned.

"You didn't faint this time," noted Steve, "Maybe we're becoming acclimatised. Any idea what just happened?"

Only one thing I knew might explain: "Death is a process, not an event. Perhaps the xenobiote's death is taking longer than we'd first assumed. Steve, we must hurry."

We leapt out of bed and got ourselves transferred to our workplaces immediately. Our acclimatisation to the flipping was a welcome surprise— less time spent unconscious meant more time solving the problem.

Time was what we needed most, so we decided to split our efforts. Steve would now work in the holding lab with his 'woodlouse', and I would work in my own lab with the cell cultures.

First things first: the calcium fluoride problem. If Kaz was correct, a toxic accumulation was causing the xenobiote's

illness. Why?

I donned my biosafety gear, entered the lab and bolted towards my microscope. As I turned its focussing knob, those alien cells swam into view. They looked like bleached Fuchsia flowers suspended in globules of lemon jelly. Most strikingly, the petals of those flowers alternated between charcoal black and a crumbly white.

Kaz's beaker of white powder flashed through my mind.

That was as good a guess as any. I pierced the cell's membrane with a micropipette, then inserted its tip into one of the white petals and aspirated. The white substance was drawn up and I must have sighed with relief.

After a hasty decontamination, I dashed into Kaz's office, gasping for breath, and handed her the sample. She saw the frenzied look in my eyes and dropped her pen. We rushed down the corridor towards her lab.

The mass spectrometer clicked and hummed for four minutes. I know because I was glaring at the clock throughout.

When it was finished, neither of us spoke. We gathered round the computer monitor on which a bar graph had popped up. Kaz prodded a cluster of peaks on the far right.

"Uranium," she proclaimed.

My brain was so muddled by this point I could only squeeze out one word: "What?"

Kaz threw off her lab coat and rushed out. I followed in her wake. In her office, Kaz reached for an ugly mass of black crystals she'd been using as a paperweight. She juggled it between her hands, excitement suffusing her whole body.

"Antozonite!" she exclaimed, "We're giggin' Sue. We got this."

And then our time was up.

Part 11

The hospital ceiling spun into focus.

"Steve, pass me your tablet, phone, anything with internet access," I said, shooting upright, "I need to—"

But the voice that interrupted me was not male: "Sue, you crazy? Steve passed away...remember?"

"Kaz?"

To this day, I'm unsure of what caused the change, but I knew I couldn't discuss it with Kaz.

"Steve's fine," I said, "I was just working with him. What are you doing here?"

"Oh, Sue..."

Her sappiness irritated me. Yes, Steve was missing in action, but the clock was now ticking. I pushed the matter to the back of my mind and cracked on.

"Tell me, what is 'antozonite'?"

Kaz giggled. "Wow, antozonite!" She flicked her wrist with irritating confidence. "That is, like, the fluorine chemist's best buddy. I've actually got a chunk on my—"

"I know," I cut her off, "How does it relate to the xenobiote?"

"Antozonite is the mineral form of calcium fluoride with...oh, man! That's—"

"Kaz! Concentrate!"

"Uranium inclusions, Sue!" She clasped her cheeks with surprise at the revelation. "They emit beta-radiation which splits the calcium fluoride, liberating fluorine gas. Make's it...uh...hella stinky."

A fluorine-based biochemistry clearly wasn't dangerous enough for us. Of course radiation was involved. For Christ's sake, I thought. In what hellish environment did this creature evolve?

Kaz continued: "So you think the xenobiote is, like, usin' beta-radiation to—"

But I wasn't listening, because I was already dialling the number of my senior. One phone call later, we were headed back to the lab by helicopter.

And now we must discuss my 'failure'. Everyone fails at some point, however experienced. I've exhausted many sleepless nights thinking it through, and I think I can now explain.

At medical school, one is forced to learn a range of biochemical principles, often illustrated by bewildering flowcharts. Some people look at these flowcharts and make their own inferences. For example, vitamin C is required for the synthesis of collagen, which is responsible for the skin's elasticity, so one may deduce that vitamin C supplements endow a person with healthier, more youthful skin. In reality, any excess is simply excreted in the urine. At worst, the excess may be toxic. And yet this trivial error, of all things, was my greatest failing?

When we arrived back at the lab, I asked that the xenobiote be bombarded with beta-radiation, hoping this would break down all of the calcium fluoride in its body. Even Kaz agreed

this was probably our silver bullet. Well, the xenobiote melted.

More accurately, it sublimated— solid to gas. The xenobiote was so completely destroyed that its defence mechanism ceased with immediate effect.

Yes I was finally released from the shackles of BQO but I was now locked into a narrative without Steve. It slowly dawned that with one mistake, I had simultaneously murdered both the xenobiote and my friend. I have no evidence to show this is the case. As far as everyone else is concerned, Steve died in an unfortunate accident without me even present.

Was it Hubris to think I might cure a diseased extraterrestrial? Was it absurd to even try? They often say in medicine, the most important principle is to know one's limitations.

Afterwards, I returned to the wards, treating unusual infection after infection, but the days dragged. The weekend dragged too and still the memories occupied my daydreams. Whatever I tried to break the monotony, I couldn't enjoy anything. Fatigue overcame me.

My GP said I wasn't depressed; just grieving. Somebody is missing from the universe, she said, and it takes time to accept that. It would've been easier to accept too had it not been for BQO— the tantalising possibility of change. For a while I fantasised about harnessing BQO; the xenobiote's defence against death as used to reverse Steve's. As it stands, we're not even close. It may take us decades to unlock its potential.

Of course I tired of waiting. I became...accustomed to Steve's absence, and so I realised, this is our own defence mechanism against death: acceptance.

About the Author

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