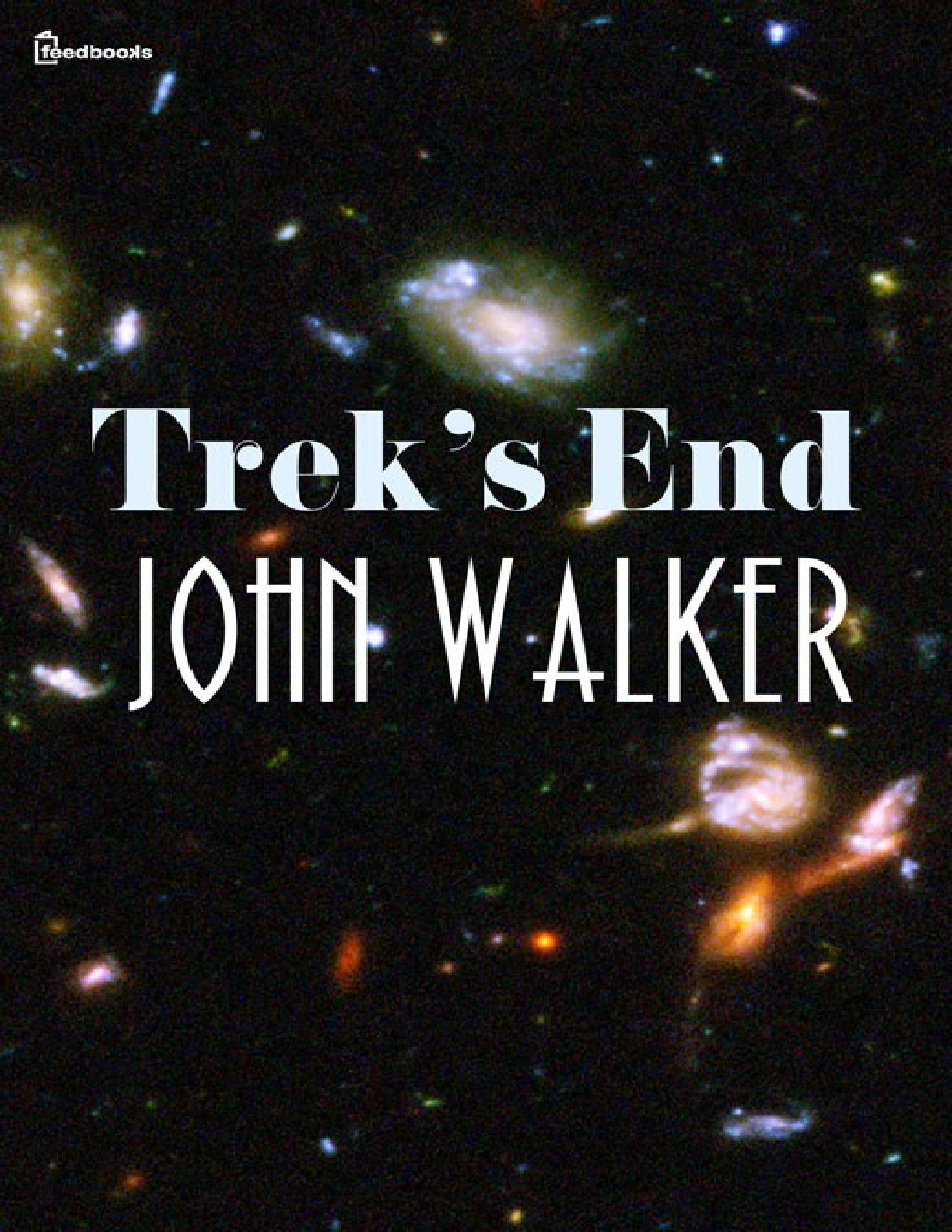

Trek's End

JOHN WALKER

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About Walker:

John Walker (born circa 1950) is a computer programmer and a co-founder of the computer-aided design software company Autodesk, and a co-author of early versions of AutoCAD, a product Autodesk originally acquired from programmer Michael Riddle. He makes his home near Lignières, Switzerland. He operates a web site called Fourmilab Switzerland at http://www.fourmilab.ch/. (Source: Wikipedia)

TREK'S END

I saw it happen. I witnessed the end of the world. And since I'm the only human who saw it, I'm going to write it down, even though there won't be any more generations of humans to read it. Somehow I *need to*. Perhaps another species will learn from our experience. Probably not. Certainly we never imagined how dangerous a galaxy we grew up in.

Context: even though born decades after Cernan made the last bootprint on the Moon, I've dreamed of going into space for as long as I can remember. I'd lie in bed at night and imagine my bedroom suddenly transformed into zero G. I'd push myself off from a wall, feeling the exquisite back-pressure of pure inertia as I squeezed my fingers to launch myself; I'd do lazy back flips and twists in mid-air, then use my toes to spring from the opposite wall. I occupied myself with all the usual space-kid stuff: model rockets, reading astronaut memoirs, even joining one of the groups lobbying for more taxpayer money for socialist space programs. But even in high school I'd faced the fact that the only way I'd ever make it to orbit would be to turn myself into a politically-correct government funded parasite, then spend a career in a program completely decoupled from the true human destiny in space. No thanks; I'd rather program computers.

Then came the Fourth of August: decapitation. Amid the shock and chaos that ensued, only a few (far wiser than this high school kid) imagined that the destruction of Washington would indirectly open the road to the stars. Like so many of the private initiatives that sprang up in the years of recovery and the dawn of the Republic, the Band of Billionaires and the GEOSPACE corporation they founded would invigorate industries grown sclerotic from decades of regulation and inspire a generation to realise their dreams, working toward their own personal future beyond the home planet.

It sure was that way for me. In my junior year of college, I changed my major to aerospace, and started to catch up on thermogoddamics, fluids, and all the real engineering I'd ignored

while fooling around with computers. It would take me an extra year to graduate, but equip me for a career in space.

After the obligatory master's degree, flight school indenture, National Service as a militia pilot, and five years of working up the ladder at GEOSPACE, I'd made it off-planet as an interorbital ferry pilot (the word “shuttle” having become as disreputable as “appeasement” and “root cause”), driving technicians and gear back and forth between the Low Earth Orbit logistics base and the GEOCans. After economics finally prevailed over national pride, it was obvious that sprinkling dozens of satellites around geosynchronous orbit was an insane way to go about global communication. Far wiser to concentrate everything in a small number of geostationary platforms (visionaries always fastened on the minimum of three, but actually six ultimately made the most sense), cross-linked by high bandwidth lasers. On each GEOCan (supposedly from “GEOSPACE Communication Array Node”, but really because the pressurised module resembled a beer can), tenants shared solar panels, transmitters and phased array antennas, but supplied their own switching, signal processing, and beam directing gear. The six GEOCans were hardly high tech, but then nothing GEOSPACE did was, really. But they made money—cubic acres of the stuff. The GEOCans were actually based on the design of the laboratory modules for the grotesque “International Space Station” that scattered debris all over China two years after the decapitation. Once the GEOSPACE engineers ripped out all the gold-plating and safetyland silliness, what remained was a suitable pressure vessel and logistics system for the GEOCans.

This was my third trip to a GEOCan as pilot—this time GEOCan Asia, above Singapore at 105 degrees East; what a view! We'd embarked three tonnes of cargo and five technicians at the GEOSPACE LEO base for the run uphill. Like most logistics missions, we'd top up station keeping fuel, but most of our cargo was changeouts for gear in the racks inside the GEOCan—signal processors, amplifiers, and so forth. The techs understand this stuff (or at least how to hook it up); I just drive the bus. After docking, completing the propellant transfer, hooking up the life support system in the GEOCan to the consumables and scrubbers in the ferry, and

checking the atmosphere in the GEOCan, my work was done until it was time to undock and burn Earth transfer orbit. The techs were busy in the GEOCan removing old gear and installing the new, muttering to themselves in Russian, Chinese, Korean, Japanese, and English, and bitching to one another in the latter. I was floating in my ferry pilot's seat, listening to the chatter on the intercom, but mostly alternating between studying and looking out the window.

Studying—my next career goal (it seems so trivial, now) was to land a first officer's seat on a GEOSPACE Trans-Atmospheric Transport, then move up after a couple of years to captain. Flying back and forth from Omaha spaceport to low Earth orbit may not seem as romantic as boosting up to where the Earth looks the size of a soccer ball, but it *pays a lot better*, plus you get to sleep in your own bed every night and shower regularly. With the majority of TAT flights already going to the first GEOSPACE Orbital Hotel (dubbed “Sin Star” by the fundies—beats me what so disturbs them about zero-G volleyball), and the tourist sector growing rapidly as volume drove the costs down, that's where the money was. Besides, with luck and enough seniority in the left seat of a TAT, I'd be in line to command a lunar ferry once GEOSPACE started to open the Moon to tourism.

Now, GEOSPACE could possibly afford to lose a ferry with a bunch of techs and some comm gear. The insurance would cover it and, Hell, we all fought to get our jobs. But losing a TAT with 70 tourists returning from holiday would in all likelihood sink not only the space tourism business but GEOSPACE as well. To be entrusted with one of those vehicles you had to be the very best of the very best.

Which I was, of course. All I had to do was prove it.

So, there I was, reviewing the TAT systems manual for the thousandth time in preparation for my first “informal” interview with the chief of the TAT crew office next month. I can hand fly anything with better L/D than a watermelon, but there's only so much a meat computer can absorb in a given amount of time from prose like, “If the primary yaw RCS fails and the prime FCS fails over to the backup yaw RCS and the RCS anomaly annunciator fails to indicate the fault, the master caution and warning system will indicate status

5104, which may be queried on the primary or backup flight display system. But if the backup FCS is active, no indication of the failure of primary yaw RCS will be given if the RCS anomaly annunciator has also failed.” Imagine seventeen thousand pages of this, and eventually being tested on all of it in the simulator.

Mine eyes, having thoroughly glazed over, gazed upward from the screen toward the ever-fascinating Earth almost centred in the cockpit window. Suddenly,*what is that?* An impossibly brilliant star came into view from the right, moving toward the Earth with an angular velocity you simply never see in space. It may have been bigger than a point source, but I don't think so. It took no more than a second to cross the two Earth diameters from where I first spotted it to the point of impact not far from the illuminated limb, a bit north of the equator.

All Hell broke loose. The impact instantaneously ejected a plume of plasma, which began to rise outward at a speed much slower than the impactor arrived. I'm not sure about my perception of time from here on. There was no camera to record it, and when you're seeing something you've never, ever, expected to see, time gets elastic. I remember my parents talking about feeling that way when “the twin towers fell.” I'm too young to remember that.

Whatever the timing, this is what happened. The Earth seemed to *shudder*, then the ocean began to blow off into a steam cloud which visibly inflated the atmosphere and turned it white as it progressed along a spherical front from the point of impact. Then the Earth, which now seemed puckered near the impact point on the right limb where the plasma was dispersing into space, belched out a spout of incandescent magma from behind the dark *left* limb. The spout may have gone into orbit; there may be a new Moon. Too bad there won't be any lovers to see it. The white wave continued to spread around the globe as the shock wave progressed and the oceans vaporised. It moved slower than one might expect, but advanced at an absolutely constant rate: the curtain of extinction ringing down upon the biosphere. Then a shudder happened about 270 degrees from the point of impact and a white band began to propagate outward in both directions from there. When all of these

converged behind the dark limb something happened which looked like a secondary ejecta event, but I'm not sure about that.

Moments after the impact I keyed the intercom to the techs in the GEOCan. “Folks, something's happened. Get up here right away.” I wasn't trying to demonstrate *sang-froid*—I'm a pilot with more than 3000 hours and that's how I talk. One by one, they floated onto the flight deck and looked out the window. All of us were struck silent by what we were witnessing. We'd lost the feeds from everything on Earth within 20 seconds of the impact. The cross-feeds from the other GEOCans were still up but nothing but carrier. By the time anybody spoke, Earth was a featureless white ball with ejecta coalescing into an arc around it.

I described the arrival of the impactor and the events before they'd arrived on the flight deck. Vasily shook his head and said, “We've known this risk since Tunguska, and what have we done—nothing. We go to space so monkeys can chatter at one another.” Yutaka disagreed, “This was *not* an impact by a solar system body.” He turned to me. “Peter, how long did you say it took for the impactor to come in from the point where you spotted it?” “About a second to cross two Earth diameters”, I replied.

Yutaka drew his computer from its holster and tapped away for a few seconds. He paused, shook his head, tapped some more, then said slowly, “Whatever it was, it came in at about ten percent of the speed of light. Dynamically, that object didn't *belong* to the solar system, or for that matter the galaxy. It was going…”, tap, tap, tap, “more than seven hundred times too fast to be gravitationally bound to the Sun, and sixty times the escape velocity of the galaxy.”

“So what was it?”, asked Jiang. I pondered the question. “Well, there are really only two possibilities”, I said. “An impactor's first acquiring relativistic velocity by successive random gravitational encounters, then managing to hit a target the size of the Earth is something so fantastically improbable it's unlikely to have happened anywhere in the universe since the big bang. So if that's what happened, we have just witnessed the single worst case of bad luck since Creation.” “Other possibility?”, asked Vasily.

“That we've just witnessed the deliberate destruction of the Earth by hostile aliens.”

We talked about these issues for several hours and then, having nothing more to say and nothing to look at besides the white ball our home planet had become, one by one we went to sleep. Maybe you find it hard to imagine going to sleep after watching the destruction of your entire species, but eventually you get tired enough and sleep overtakes you. It's not like we expected a wake-up call next morning.

The next day we monitored and tried calling on all frequencies the GEOCan could access. The GPS constellation remained on the air, but the ephemeris in the satellites showed no update since the impact. The other GEOCans maintained their laser links with ours, but all indicated no uplink from Earth or LEO and our transmissions relayed through them elicited no reply. We were the only crew above LEO at the time of the impact. The clearly visible expansion of the atmosphere as the oceans flashed into steam had been more than enough to bring down any satellite in LEO, including the logistics base, Hotel, and any TATs en route. We had supplies for 12 days at GEO even though we'd only expected to stay for three. With nothing better to do, we spent most of the day in rather maudlin recollections of Earth. Our crew, all young, male, and apart from Jiang, single, probably took the end of human history better than most might have, but there'd be no way to repeat the experiment with other humans. We were it.

Three days passed. We did routine housekeeping, scanned Earth and the other GEOCans for signals, finding nothing. We took pictures of the coalescence of the ejecta from the impact into a ring which now seemed to be punctuated by the core of an inner moon. There was nothing else to do. All of us were mission-oriented people, so we did our jobs. It seems crazy, but what was the alternative? I mean, otherwise, we might be fired.

Around mid-day, four days after the impact, the ship arrived.

Yutaka, Jiang, and I were on the flight deck when it appeared like a streak of light and seemed to instantaneously stop twenty metres in front of the ferry. It was *huge*, about 100 metres in diameter, perfectly spherical. The surface was primarily white, but with sub-structure that appeared fractal and seemed to constantly *change*. A tube extended from the craft toward our front docking port, where it engaged the drogue and triggered the contingency rescue hard

dock. Over the intercom we heard, “Please open the hatch; we need to talk to you.” This in midwestern American English.

When I cracked the hatch, there was no residual pressure differential, but the *smell* could knock you down. They floated through the hatch, one after another, five in all. If you're big on diversity, these are your kind of aliens. Two almost resembled greys out of a Whitley Streiber *nightmare*—dinky, big almond-shaped black eyes, gracile limbs, egg-shaped heads…but *leathery ears*, like a fox bat. Two more were vaguely lizard-like, but not all that creepy. They stood erect on two stumpy legs and had no obvious tail. Then there was the one with the tentacles on his (her, its?) face which smelled like…well, I've never smelled anything like that before…*brrrr*. They all seemed to have no difficulty breathing our atmosphere and if we smelled as bad to them, they gave no sign of it.

They seemed to have a strong sense of hierarchy. After speaking briefly to each member of the crew, each in his own mother tongue (colloquially, and without obvious accent), one of the greys approached and addressed me as “captain”. I denied the rank, but the grey insisted, “Based on our study of your species, one speaks for all on your ships.” With assent from the techs, I accepted that responsibility.

In bad situations, I like to get out in front of things, and this was about as bad a situation as I could imagine. I put my hands on my hips and asked the grey who stood before me, “Was it you who destroyed our world?”

“It was.”

“Why?”

The grey replied, “Because your planet presented an unprecedented risk to peace in the galaxy.”

I paused, held my breath for a few seconds, then said, as calmly as I could manage, “Unprecedented risk? You have interstellar travel; you destroy entire planets with relativistic bullets, and you have no apparent compunctions about planetary ecocide. And you call *us* a risk?”

The grey raised its head and fixed me with its huge black eyes. They're not hypnotic—just *black*—nothing there at all, not even a reflection. It said, “We monitor electromagnetic emissions of all

planets crossing the technological threshold. Never before have we found one which represents such a grave peril. Your species posed a threat so immediate, so acute, that not to act would have been negligent. We are not aggressors; we are galactic peacekeepers. We do not interfere with the development of any civilisation unless it threatens all of us who have renounced warfare.

“Your United Federation of Planets, with its incessant conflict and meddling with other developing civilisations in direct violation of its own Prime Directive and our Fundamental Charter presented a clear and present danger to us. With warp drive, which we do not possess, and cloaking and subspace communications which enabled your Federation vessels and facilities to elude our sensors, we had no alternative but to act preemptively and decisively in self defence. We could not risk a conflict with your Federation.”

Vasily was the most enthusiastic Trekker on board. He flashed crimson, then shouted,

“But there *is* no Federation, no warp, no cloaking, no subspace. That's nothing but *science fiction*.”

The aliens looked at one other and exchanged some words in a language none of us understood. Then the grey turned back to me and spoke.

“We know science. What is fiction?”

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