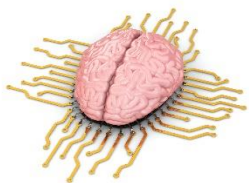


A large, futuristic soldier in a city of ruins. The soldier is wearing a helmet with a glowing visor and a tactical display. The background shows a city with damaged buildings and debris. The overall tone is gritty and futuristic.

# **SCIENCE FICTION: VISIONING THE FUTURE OF WARFARE 2030-2050**

**U.S. ARMY TRADOC MAD SCIENTIST INITIATIVE JULY 2017**



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Executive Summary  
By Luke Shabro and Allison Winer

In November 2016, the U.S. Army TRADOC Mad Scientist Initiative launched its first Science Fiction Writing Competition, with the topic “Warfare in 2030 to 2050.” This contest sought unconventional thinkers and was open to people from all walks of life. One of the founding ideas inspiring the contest was the notion of ‘Science Fiction as reality.’ Science fiction has been historically predictive of future technologies and ideas. One example is the prevalence of mobile “smart devices” and advanced video communications in popular films and television such as *Star Trek* and *Back to the Future*. These kind of forward-looking ideas and themes help the Army think about and prepare for future challenges and opportunities in conflict. We sought to challenge writers with the opportunity to contribute ideas outside of what the Army is already considering about the future, and they delivered.

We experienced “catastrophic success” with over 150 submissions from authors in 10 different countries (Singapore, Germany, Finland, UK, Russia, Ukraine, USA, Canada, New Zealand, and Australia). This diversity in authors presented us with a wide variety of thoughts and ideas on the future Operational Environment and warfare. Through the art of storytelling, the Army was able to visualize the known, probable, and possible challenges and opportunities that the future holds.

The stories allowed the readers to place themselves in a world where familiar met unfamiliar. This world featured a myriad of future technologies forcing paradigm shifts away from current, conventional thinking. The future world was hyper connected, extremely dynamic, and at times uncertain. Writings portrayed an environment in which humans, and especially Soldiers, were confronted with complex, rapidly-changing situations outside of the known operational environment of today. Despite the variety of the imaginative worlds presented, there were a multitude of technologies and themes that were prevalent. These commonly recurring themes and technologies provided valuable insight into warfare in 2030 to 2050.

**Drones:** The most commonly featured, spanned across all physical domains: Land, Air, Sea, and even Space. Sizes ranged from micro to the size of conventional aircraft and ships. Drones in the stories were smart, self-healing, self-learning, cognitively connected to users, and used in swarming across all domains, often autonomously.

**HUD/ AR/ VR:** Military personnel and civilians alike in the stories frequently used heads-up displays (HUDs). These were typically integrated with augmented reality (AR), real-time networked communications, and multiple weapon, vehicle, and intelligence system interfaces. Virtual reality (VR) and AR were critical components in future warfighter training, planning, and decision-making.



**Human enhancement:** Human performance enhancement and augmentation in many of the stories ranged from known technology such as pill-form stimulants/enhancers to permanent implants and genetic modifications.

**Advanced Artificial Intelligence (AI):** More advanced and robust than today- self learning, autonomous, and trusted by humans; sometime even sentient. AI was available at the edge of the battlefield to automate a multitude of processes, improve situational understanding, control weaponry and C2 functions, and aid in decision-making.

**Advanced Materials:** Nanomaterials, cutting-edge synthetics, smart materials, and radical new metals enabled other technologies to exist and advance (i.e. exoskeletons, space craft, and medical).

Through the depiction of the aforementioned technologies and the portrayal of future environments, multiple prominent themes emerged in the Sci-Fi corpus.

Virtually every new technology is connected and intersecting to other new technologies and advances. **Convergence** frequently occurred across numerous technologies. Advances in materials, AI, drones, communications, and human enhancement amplified and drove one another across multiple domains. A major **cultural divide** and gulf in understanding still existed between different populations even with developments in technology (including real-time language translators). While increasingly integrated and advanced systems improved upon each other, the inherent **connectivity and complexity** that resulted presented a number of challenges and opportunities for future forces and populations. The fully enmeshed communications and sensing residing in future systems made the **hiders vs. finders** competition ever more important in future conflict settings. Additionally, the constant battle for and over **information** often meant victory or failure for each side. Due to the snowballing speed of interaction on the battlefield (during and in between high-intensity conflict), a number of the military units in the stories required **smaller units**, with large effects capabilities and more authority, and operated under **flat and dispersed command and control structures**.

The following compendium of some of our top science fiction stories gives an enlightening window into the future operational environment and the future of warfare. As one reads this collection of stories, they can almost imagine the look, feel, and sense of what “Warfare in 2030-2050” will be.





Patrolling in the Infosphere  
By Mathison Hall

"Time to drug up and synch in to your drones. We step out in ten," Staff Sergeant Nguyen said while walking briskly down the row of cots in our inflated tent. "And, make sure you link up with the NCNA team leader before we step this time," my squad leader adds without turning around to look at me.

"Got it." I'd been reprimanded by the company expeditionary team commander for failing to coordinate a patrol with my counterpart a couple of days before. He accused me of deliberately doing it, of holding a personal grudge.

I swallow my pill with a swig of warm, oily water and scan in to my two drones. Our medic smiles wryly from behind his projected display as the red light sweeps across my face, picking up the implant just below my right cheekbone. "Sync to Specialist O'Brien, 4321929654, successful. All systems operational. Power: 89%." My two angels chirp in near simultaneity, their slight offset creating an electronic echo.

I push out of our tent, the inflator humming quietly by the flap. God, it's hot out here. It reached 142 Fahrenheit the day before, and the intel bot reported that it's only going to get hotter. The black solar cell outer layer of the tent is hot enough to cook on. The company expeditionary team we replaced claimed it hit 150 a half-dozen times during their 90 days in the dust. It's crazy we keep patrolling in the middle of the afternoon.

I quickly make my way across the open yard to the Chinese tent. My display lights up as I rush to get out of the open. Damn it! I forgot to mute my display again after spending my precious time off after this morning's patrol scanning the newsfeeds and talking to a groggy Lucia.

"Mark, do you have a second?" Lucia again.

"Not right now, babe. I'm getting ready to head out."

"Head out? Again? You were just out this morning. And what the hell are you doing outside without your suit?"

"The suit's still charging up. The dust clouds mask the damn solar panels, and I want to go out with a full charge." I push my way into the vestibule of the Chinese tent. Their inflator is a lot quieter than ours.

"Mark! Seriously? They hit you with guided mortars just yesterday. I saw the video on SkyChat. The mortars hit your tent!"

"Yeah, well, they can't penetrate the tents. I'm in the vestibule of our lovely brothers now. What is it, hon? I really need to go."

"Mark, I'm sorry you have to work with them. I talked to your mother about it. She had a good point. They aren't the ones who killed your father in The War. Maybe their father or uncle did,



but not them. And besides, it's not even the same government anymore. We won The War, remember?"

"Yeah, but they still control all the mines and oil fields on this drying wasteland of a continent. And most of them live better now than before the war."

"Got it. And Africa's not a wasteland, just the part you're in. Fried by the temp rises and desertification. The parts on the Indian Ocean coast that are still above the floodplain are about on par with our East Coast these days." Lucia loves to work in her politics. "Listen, I need to talk to you about our daughter's teacher. She keeps contacting me about her—"

"Lucia, I'm sorry, I've got to go. Nguyen will chew me up for videoing home on duty like this again. Bye."

"Mark, w—" I switch out and mute the personal line in my implant before knocking on the inner door of the United Provinces of China's tent. Staff Sergeant Nguyen has been cracking down on personal implant use while on mission time, a losing battle in my opinion. PFC Dwiezer in Sergeant Mendez's team bragged about watching an entire movie while on patrol a few weeks ago. That boy is going to end up dead or in confinement before this rotation is up. And the Chinese would flip out if an American soldier came into their tent with a video call running.

"Yes?" one of their hackers asks in a thick Mandarin accent.

I speak straight into my watch. "We're leaving in about five. You ready?" The Mandarin translation comes out a moment later.

"Yes, New Chinese National Army always ready," comes the response in halting English.

I make my way out of their inflated tent as fast as I can, running back across the scorching courtyard to my own tent. This is the part I like. The e-pills are fast acting, but I wish they were faster. My head feels lighter and time seems to slow down. I start picking up on little details, like the blinking charging light on Mendez's suit off to my left and a thread on the end of Smith's bunk swaying in the breeze of the tent's air conditioner near the door. I walk past the rest of the squad to strip off my PT gear and skivvies and pull up my link-suit, the network of circuits and silicon threads gleaming down my arms and legs and chest. The link-suit requires full skin contact to work. It synchs right into your nervous system, and, as a bonus, keeps your body temperature at a performance optimal 98.2 degrees. My vision hones in; I can see each minute thread of silicon on my skin-tight suit as I zip the front up to my neck and pull the hood over my shaved head. I can hear the individual zipper teeth of each of my fire team members' suits as they zip up. Time slows down as I begin scanning the mission briefing in my display, the hundreds of lines of data projected onto my retina move fluidly while I absorb each piece of information.

Security patrol. Check. Ensure the epidemic is contained to the clinics the Chinese set up two days ago. Check. Make sure the resisters aren't stealing any of the bodies before they're burned. There are reports the resisters are trying to harvest the synthetic bug to spread the epidemic farther south. We aren't sure we can stop it if it gets into what's left of the greenbelt



along the Niger River. Our security patrol is critical to the World Health Organization's containment plan. Ha! Our squad security patrol is that important? I doubt it. But one thing's for sure—the Russian and Brazilian cube-sats will be watching our jamming bubble and broadcasting it over SkyChat. The whole world will know right where our squad is, even if we scramble the hi-res images. And the resisters will know our route again. If they hack into our transmitter like they did last week, we'll be uncovered and the cube-sats will beam live images of us around the world as we fight off any ambush. It's almost a guarantee they'll throw some poor kid, probably some helpless six- or seven-year-old girl, right into the mix where she'll be torn apart by their bullets and ours on live SkyChat in front of an audience of hundreds of millions. That's exactly what Moscow and Brasilia want, to humiliate us in the never ending battle for control of world opinion. That's why we have the Chinese with us. The New Chinese National Army runs the clinics, and the resisters can't defend against our hackers and theirs at the same time. The attack codes are just too different.

"You tell them?" Staff Sergeant Nguyen asks as she strips off her PT gear and skivvies before suiting up in her link-suit. The suit sucks tight to her body as she puts it on, the miles of silicon trails linking into her nervous system through her skin and flesh. She then pulls her hood over her shaved head, leaving only her face exposed. The hood's silicon trails light up slightly, showing they've linked into her thoughts to control her suit and angel drones. Unless the resisters or their allies are able to hack or pulse her.

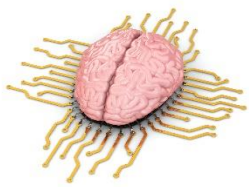
"Yes, sergeant, they're tracking. I told them five minutes." She can't stand the Chinese any more than I can. But for her it's because they look down on her. Partly because they still don't have women in their grunts...one of the last nations without them, but also because of her name. Her great-grandparents moved to America nearly a century ago after our war with Vietnam. And she's only a quarter Vietnamese anyway, no more Vietnamese than I am Irish, if one of my ancestors even ever lived in Ireland. But the Chinese certainly haven't forgotten The War, or the islands the UN awarded Vietnam mineral rights to.

"Good. Let's load in second squad. Everyone done with the briefing?"

"Hoo-ah!" the grunt chorus shouts back with a subtle mix of motivation and sarcasm.

I step into my exoskeleton, my link-suit hooking into the inside of the exoskel. "All systems charged and functional. Left knee joint operating at partial strength, but combat ready," the exoskel's voice calmly reports. They hit my knee hard three patrols ago. The contractor jury-rigged it to function...partially. I can still run up to forty-miles-an-hour and jump to the third floor windows, but the outside of the joint started vibrating and pulling oddly to the right on patrol this morning. It'll be fun trying to hoof it in a one-hundred and fifty-five pound exoskel plus another sixty pounds of gear, weapons, and ammo with my own knee power on the left side if that thing gives out.

Angels, let's go, I think to myself. My two synched drones lift off the charging shelf and lock into my exoskel's shoulders. The suit hums softly and each step clinks lightly as I line up with the rest of the squad for our final pre-combat checks.



Staff Sergeant Nguyen's exoskel head turns and looks over us. I can see her face through the clear polymer face shield. She has a sly smile. I've got to hand it to her, she loves patrolling.

"Second squad online and ready," her voice projects over our intercoms.

"Copy second squad. We have a good synch here in the company operations center. Information operations and intel are both online and monitoring. Your Cyber Force bubbas are up and running ready to save your hides. Air Force drones are airborne and you've got priority of fires from one Navy railgun. No news feeds right now. There's at least one Russian cube-sat up there watching our sector, but it's not projecting over any social media yet. We've let Fort Meade know, and they should have it down soon. Tell us when you're ready to step and we'll start chatting."

That's my drinking buddy, Coder Second Class Hawkins, for you. He never passes up a chance to say in fifty words what can be said in ten. Makes him a good drinking buddy, especially when he gets going. I like to give him crap for being the only Cyber Force hacker deployed in our sector. His whole service spends most of their careers stateside. But no one doubts that they're the main effort.

Chatting...damn. He and his reach-back squad in Maryland are going to start lighting up the news feeds and social media soon. Lucia's going to be pissed. I bet she's watching right now from Fayetteville. Let's see, how many hours ahead of the East Coast are we? Five? She probably hasn't left for work at the intel fusion cell on base yet. Probably at home getting Cindy ready for school and watching #DCo3dBCT82ndAirborne right now, monitoring the Russian cube-sat feed and our chatter at the same time. I bet Fort Meade gets the cube-sat down right about the time we're wrapping up our patrol, as usual.

"Second squad ready to step." Staff Sergeant Nguyen.

"Copy, second squad. The public affairs specialist is up and transmitting. We've got a foothold into the local internet exchange point, and we've got good visual on the whole town from the drones. No abnormal activity. Go ahead and step."

We leave the tent, the nine of us stepping into the scorching sunlight as two Chinese field hackers march across the courtyard in their suits. Their suits' exoskels look suspiciously like ours...same design and functions and almost the same weapons systems. Suits look a little sleeker and newer; less used. Two headless mules, our ammo, water, and gear resupply drones, fall in behind us, their legs moving rhythmically and spider-like as their LIDAR sensors navigate the terrain in front of them and keep them locked on to us 20 yards to our rear. They follow us like four-legged mechanical spiders, crawling across the dusty, crumbling streets between our company's firm base and the center of town.

A few minutes into the patrol Specialist Bronnan runs ahead, jumping over a burned out double-decker bus to take up his over watch position with Specialist Kates. Kates is good. She's our squad spotter, calling in the hypersonic railgun rounds from the Navy squids sitting offshore a little over three-hundred miles from here. Bronnan is a damn designer. He's the only one in our squad, but they're starting to come into the Army. There are laws against giving designers





preferential treatment *and* prohibiting discriminating against the bastards, but I don't like them. I don't trust them. I know they're human beings and all, at least technically, but I don't think I'll ever get use to the idea of a person whose traits were picked by his parents. And I think it's crap that he gets to run the same Army physical fitness test and qualify on the same marksmanship ranges as me. The man can run a 3:40 mile and do sixty dead-hang pull-ups, not to mention that he can hit a bullseye at 1000 meters without a tracking bullet. He says he has the equivalent of 20/5 eyesight. And he can think faster than us, even when we take the e-pills. I know they say thoughts like mine are prejudice. But these damn designers are like robots to me. I don't think someone like me will even be able to get into the Army ten years from now. Us naturals—"love babies," they call us—can't compete with the designers. And they just won an International Court of Arbitration case that let them into the Olympics. Not one natural even had a chance of medaling at the last Olympics in Lagos not all that far from here. It won't be long before decrepit nations like this one will have designers too. Our designers will be the only ones capable of fighting them. It's the end of us in my opinion, and I think the next big war will be between the naturals and the designers. No more America and Japan versus China and The Philippines over sea lanes, and no more America and India versus Russia and Brazil over cyberspace spheres. It's going to be us naturals against designers to the death for control of the planet. The only chance we'll stand will be to use automatons, which are currently outlawed by the International Conventions on Artificial Intelligence unless they're synched to a controller.

"O'Brien, take your team around to the right. Satellite us two blocks over that way, and keep the New Chinese Army squatters with you. Keep your damn eye on them and make sure your linkup is tracking them every step."

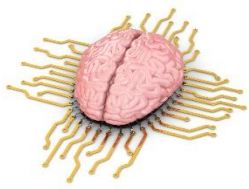
"On it, sergeant." In my heightened e-pill state I see kids three blocks down darting out of the covered courtyards where they swelter in the heat, leaving the mag-fans blowing only slightly cooler air into the covered streets and alleys. The blare of a thousand tablets fills the streets with a symphony of Ejaghan, Mandarin, Arabic, English, and Swahili banter. I hand signal to the two Chinese soldiers to fall in behind my team. At least we don't allow them to synch with us.

Execute overwatch, auto kill any unidentified drones, I think. My hood picks up my thoughts instantly. Both my angels lift off from my shoulders. Six more come off the shoulders of my team members. My display lights up again, projecting what each of my angels sees into my retinas. I can see the overlays of the town across my vision, every person, goat, and dog showing up as a blue heat signature, their body temperatures cooler than the ambient temperatures indoors and out. The angels also scan the skies. I see icons for our drones, news drones, SkyChat drones, the Médecins Sans Frontières drone, the Human Rights Watch drone, several local government drones, and UN drones all around us, but no bogies or unknowns.

"You're up on the socials," Hawkins' voice comes over the comm.

"Which ones?" Staff Sergeant Nguyen asked.

"Most of them, sergeant. SkyChat is tracking you, and you're up on Wie-un and VuKontate as well. We're tracking. Public affairs released a statement about your patrol providing security to



the locals, getting them water and medicine, stopping the synthetic bug from becoming a pandemic, and yada yada yada. The Russian and Brazilian newsfeeds are already making comparisons to that patrol in Delta Sector a few weeks ago, the one that accidentally killed the kid.”

“Christ.”

“We’re already countering that. The company commander is tracking, too. We’ve started livestreaming your forward view displays with a three-second delay. Coder 3rd Sauber is back at the Fort monitoring and splicing those. You ready for an interview? World News Alliance is requesting.”

“You take it, Hawkins, I’m a little busy.”

“No can do sergeant, the general’s orders. It’s got to be a Joe on patrol...show our true, unfiltered side.”

“Copy Hawkins. Sergeant Mendez, interview time.”

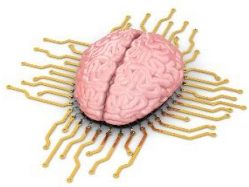
“Seriously, sergeant? On patrol?”

“You heard me, Mendez. Interview. You’ll be famous.”

Sergeant Mendez, he’s got first team, links in. Thank God for the e-pills. He can keep an eye on his angels, his team, Staff Sergeant Nguyen, and what’s going on around him while talking to whatever bot reporter is interviewing him this time. He may be a natural, but he’s good at the cognitive splits, even better than me on the e-pills. That’s why she picked him.

Sergeant Mendez switches his intercom off and starts his interview while patrolling. Lucia is probably watching and listening to it, while watching the live feeds of our patrol from the cube-sat and drone cameras. I don’t know why she does that to herself. Staying up watching my patrols, calling me on the display in my eye as soon as I get back, berating me if I keep it muted too long. I know my grandfather was able to chat with my grandmother online soon after finishing many of his patrols in Iraq back in the opening years of this century. But she couldn’t watch his patrols live. What a different world. He told me stories of *his* grandfather writing letters home from Korea, letters that would take a week or more to cross the Pacific. My great-great grandmother would go days and even weeks without receiving a letter. She had no idea if he was patrolling or fighting or messing around with his squad-mates or dead. But we haven’t been in disconnect for years...for at least a generation we’ve been continuously linked in to the nets. Nowadays the world instantly knows when you die.

My angels pick up three armed men moving around the corner of a building two blocks away. Not enough info to engage, but enough to keep an eye on them. I think about Private Smith and Specialist Al-Abadi moving into an open wedge formation, covering the alleys to our west in preparation for a potential ambush by these three. My link-suit transmits to theirs, guiding them as they move to the edge of the road and then into the adjacent alleys, their angel drones



watching behind and in front of them. One of my angels registers two of the three men's body temperatures rising faster than the ambient heat exchange should cause. "Al-Abadi...suspicious body temps from two of those three. Watch all three, they're probably up to something."

"I see it too, O'Brien. On it."

Suddenly my display starts to dim and shutter. "Hawkins, something's not right."

"On it, O'Brien. Looks like we have a hack in. Locking on now. It's routed from Ankara through Milan and then Newark back stateside, but from the code I'm seeing it looks eastern European in origin. I'm blocking it now. You should be good in a second."

"How are we on the messaging, Hawkins?" It's Maj. Grossier, the expeditionary company commander, our CO, coming on the line now.

"Good, sir. The info ops shop is showing our patrol. Russian media and some private info center out of Dhaka is showing dead bodies along the route and old footage of our soldiers killing someone in a previous firefight. The images are being super-imposed on the current streets, but we're countering in twenty-three languages right now. No significant chatter on the network at the moment, and the major news organizations seem to be ignoring us. The fringe networks on both sides are off the hook, but nothing out of the ordinary. It looks like only about 2.3 million people are following the patrol, and only just over one million actively so. The follower count is rising by about 30 thousand a second—"

"Break, break, look sharp squad," Staff Sergeant Nguyen breaks in. "I'm getting a feed from our cube-sat that we have a swarm coming our way."

"We see it here," the CO responds. "They're low and on a short range comm link, possibly even an old Bluetooth or the like, but we're using your exoskel receivers to pick up on their signals. The router is probably nearby in somebody's pocket or backpack. Get ready to fight while we hack in and try to find the source. It's got to be close with a signal range that short."

"There they are!" I yell, my angels locking on. "Open up your angels!" Our shoulder drones start shooting pulses at the drones in the swarm, trying to break their links.

"Drones locked," my angels chirp in my head almost simultaneously. I raise my rifle to a 45-degree angle, pressing the sync button on the side of the pistol grip while looking at the targeting cross-hairs displayed against my retinas from my angels via my implant.

"O'Brien locked and firing."

"Al-Abadi locked and firing too."

I pull my trigger, my M-43E sending out three-round bursts of guided 10 mm by 2.5 mm tracking rounds. I look at a different enemy drone in my retina display just before each burst, the e-pill allowing me to track onto a new target in less than a second to keep pace with the bursts. I hear the report of Private Al-Abadi's M-43E service rifle as he does the same. Soon Smith follows.



The lead drones start to come down as the tracking rounds arc over the five blocks of the four- and five-story slum buildings separating us from the swarm. Our angels start disabling some as their comm links are cut by the pulses. Several disabled drones link back in quickly and start flying again, but at least the link breaks slow them down. Our headless mules race up close behind us, ready to reload our rifles.

“Tough signal, guys” Hawkins says dryly. “We see them trying to hack in, but they’re covered. Working with the Chinese on this. We need you and them to move closer to get a stronger lock.”

I start to run toward the drones, now three blocks away. Smith, Al-Abadi, and the two Chinese soldiers follow. We close fast, hitting a forty mile-an-hour sprint in our exoskels after just a few steps. The first drones to come into plain sight pop over the line of crumbling cement and rebar buildings in front of us. They start firing as soon as they clear the tops of the buildings. The rounds bounce off our armor and visors, but a few dig deep into the armor plates.

“Damn it, I think they’ve got mini-sabots!” I yell. “They’ll punch through our armor soon. Keep firing, but get inside fast, around a corner so the auto-tracking rounds can’t turn!”

The drones are falling fast to our own rounds. I see the belt of ammo feeding out of my exoskel’s right forearm into my M-43E.

Three men wrapped in flex armor pop around a corner down the street. Two open up with machine guns while the third aims an antenna our way.

“Pulse gun, nine o’clock!”

Private Smith points his weapon in their direction and pulls the trigger. His weapon unleashes a volley of fire, striking the three and knocking them to the ground. But the resister with the electro-pulse gun is able to fire before he is hit. Al-Abadi falls to the ground, his suit’s circuits thrown by the micro-electromagnetic pulse generated by the gun and the backpack battery unit the resister wears just as an explosion rips through the alley. Smith and Al-Abadi vanish instantly.

“I’ve got a complex ambush over here,” I yell into my helmet.

“The casevac drone is on the way,” comes the soothing automated bot reply.

My M-43E’s low ammo indicator flashes in my retina display. “Re-arm,” I say and think at the same time, trying to calm down from the events of the last few moments as I crouch beside the wall of the building next to me. “Smith, Al-Abadi, talk to me.”

“I’m good, specialist,” Smith replies. “That IED wasn’t strong enough for the suit. It looks like all three of the skinnies are down. Our sabots punched right through their flex armor. Al-Abadi’s suit looks like it’s down hard. Getting to him. He’s probably cooking in there.”

“Casevac drone is ten seconds out,” I reply, watching the status on my display. One of the headless mules trots over to me. I rearm as the casevac drone completes a swift dive into the alley and hooks on to Al-Abadi’s suit. He’s gone in an instant, whisked back to the company firm



base through the dusty haze. The drone swarm has dissipated too, but it looks like several of them are headed back toward Staff Sergeant Nguyen's part of the patrol.

"Swarm headed your way, Sergeant Nguyen."

"I see it. Ops center, how are we looking?"

"Just about there," Hawkins replies. "It looks like the controllers are spread everywhere, like usual. The Fort is indicating cafes and homes tied into internet exchanges in Sevastopol, Karachi, Taipei, and Sao Palo. Damn near everywhere. Likely kids playing games as always. These drones aren't autonomous...they're networked to kids or whomever all over the world. The Fort is shutting down the sites one by—"

"Got it! Don't care! Do you have the source?"

"Yes, sergeant. Locking on now. Looks like a mobile base station, probably backpack, about four blocks to your north. We've got a lock."

"Diablo 6, this is Nguyen, request immediate strike."

"I'm tracking, Nguyen," comes the CO's reply from the expeditionary company command tent. "Approved. We're firing now."

Our patrol is a few miles from the company firm base by now, so we don't hear the automatic 81 mm mortars fire. But it's only about 25 seconds before we hear the other end of the storm. The soft "thugh-wump" of the internet protocol address guided mortars reverberates through the alleys and streets to our north. "Thugh-wump...thugh-wump, thugh-wump." The drones start to hover or slowly descend to the ground, switching to auto-cast mode. The guided rounds from our M-43Es and the limited jamming of our angels take them down quickly.

"Good news is we got him. Some dude running down the back alley two blocks over was routing the control signals to the drones. Bad news is Russia Today and Brasilia TV are showing images of dead kids in the street. I'm already seeing news feeds about Americans killing civilians including children with indiscriminate mortar fire. We've just jumped to 125 million people actively live-following our patrol, increasing by nearly one million a second. Request permission to upload all of the live combat feeds from the angels, sir." Hawkins never shuts up, but he's quick on the news feeds.

"Approved, and make sure the Fort is tracking," the CO replies immediately. "Nguyen, I'm seeing no signs of synthetic bug corpses in your area, correct?"

"That's right, sir."

"Alright, bring your squad back to the firm base. You go any further, they're just going to use this against us. I'm monitoring the Chinese feeds. They're telling the same story we are. I'm going to send Sakash's squad out in a few minutes to continue to the patrols further east to confirm there're no synthetic bug corpses that way"

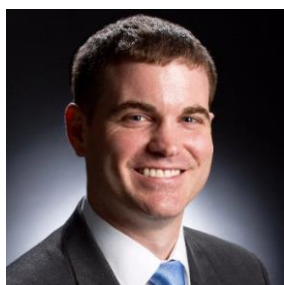




We trot back at a healthy 25 mile-an-hour clip, our mules and surviving angels keeping pace alongside and above us. By the time we get back the news feeds have finished covering what happened to us and moved on to the next crisis wherever in the world. I see images of our patrol, both real and doctored, passing across the various social feeds. The intel cell is already analyzing the effects on a half-dozen global financial indices while the Navy mini-ship drones are broadcasting from off the coast. Air Force high altitude drones are in place now jamming the Russian cube-sats. We can't shoot them down...they're above the UN altitude convention and we don't want this pissant crisis blowing up any further, but now that we're locked on we sure can jam them for a few hours. Sakash's squad will likely have better luck.

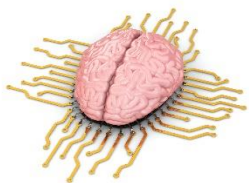
I check in on Al-Abadi in the medical wing of our company inflatable tent-plex. He's fine. The electro-pulse hit his suit hard, shutting down not only his cooling but his airflow as well. He blacked out, but he's not hurt enough to need to evacuate to the ships offshore. By the time I get back the rest of the squad's soldiers have already finished their post-patrol cocktail, rehydrating and easing them off the e-pills so they can slow down and hopefully get some sleep. Before the cocktail has its full effect Nguyen debriefs the squad in her usual methodical and monotone way. We then hit the showers so we can bed down to get a few hours' rest before we head out on the next one. Lucia is probably waiting for me to call in. She knows I've been back for a couple of hours at this point, and she knows I have my display on mute.

*Although this is a work of science fiction, the views and opinions expressed in the publication do not necessarily represent the views of the Johns Hopkins University Applied Physics Laboratory and should not necessarily be construed as an endorsement by Johns Hopkins.*



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Among the Apple Trees  
By Ethan Skarstedt

Cade rose to his feet in the back of the copter, gripping a cargo strut in the ceiling to keep his feet as the copter swooped and dipped through the dark night along the nap of the earth. In the darkness, his recon package readied themselves around him. Birds 1 and 2, a robin and a crow, fluttered to his shoulders, hunkered down, and gripped his shoulder pads as though they were going to ride out a storm on a high branch. Cats 1, 2, 3, and 4 leaped to the seat he had just vacated and stared, ears twitching, from Cade to the troop door on the front starboard side of the cargo pod. Dog, a Kuchi, heeled at Cade's left, barely able to contain his excitement, taut as a bowstring, a faintly sensed pressure through the armored panels on Cade's left thigh. Rats 1 and 2 braced themselves in their hardened nests in the bottom of Cade's backpack.

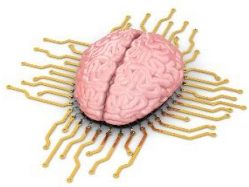
Just forward in the cargo compartment the men of ODA 9126 stood up at the same time. They tightened straps and tested buckles, starlight from the portholes revealing only hulking forms in the dark, bulky with equipment and armor. Cade could hear their clothing and gear rubbing and clicking and wondered if it was his own hearing or an overlay from the cat's naturally more sensitive feed, piped in through the ear buds he wore. He muted all four cat's audio feeds and the character of the sound around him changed. The sound of the four big muffled electrical rotors outside became a smoother less harsh buzz, the rushing wind dropped an octave and he could no longer hear the sound of the green beret's fiddling with their equipment.

Captain Legan murmured into the comm system, his sibilant southern drawl quiet but clear in Cade's ear.

"Sound off, gentlemen." There were only six members of 9126 on this operation. Captain Legan had decided during the planning phase that a lighter footprint was better than six more guns.

"Curly, up." That was Frank, the bravo, a thick squat black man who would grin snarkily while he insisted that his handle was actually inspired by his ability to curl so much weight.

"Brooks, up." that was Garth, the charlie. He'd been tasked as a sniper on this op, with no explosive work anticipated on a surveillance and reconnaissance mission. He still had some sort of explosives on him though, Cade could smell the C5 and det cord. That, he knew, was because of the Dog and not his own nose. Cade reached up and touched the band holding the scent emitters under his nostrils, adjusting how it lay along his cheekbones. Small tubes followed the bands back to the scent production tank, about the size of a whiskey flask, on the top of his back plate.



"Mango, up." Christoph, the medic, or delta, had a southern accent and a style of speech that matched his personality and mannerisms, quick and clipped.

"Jake, up." The echo or communications sergeant, Howard Platt, always sounded annoyed. Cade had asked him once why his handle was Jake and Howard had replied, "Because Jake was an @#%#!@#," and refused to discuss it further.

"Ponzy, up." Finally the team's sergeant, the zulu, piped up. He was a small man. The rest of the team treated him with a deference bordering on fear. Cade had not yet figured out why.

Cade spoke quietly, "Recon, up." The wraparound glasses he wore held several lasers in the frame that beamed his heads-up display directly onto his retina. No light leak, high-res, and no problem with fading even in full daylight. And if he closed his eyes, thank all that was holy, the display went away. All nine animals of his recon team had their own rectangle of tightly packed data arranged in a ring around the middle periphery of his vision. They were all excited, heart rates elevated, but well fed, well-watered, and ready to exit the smelly, noisy interior of the copter. And none of them had an urgent need to defecate, thank heavens. He didn't need any more problems with the pilots or the maintenance crew.

Captain Legan, as planned, put the copter down canted sideways on the military crest of a ridgeline and the team burst out of both sides of the copter taking up security in a tight perimeter immediately outside its fuselage, flat on the dirt among the grass and low bushes.

Using his input stone, a flat rounded oval the size of his wallet, Cade slid and tapped his hands and fingers over its surface, menus opening and closing in his HUD. He held his entire recon package close except for Cat 4. With a promise of interesting smells he urged Cat 4 thirty meters straight up through the underbrush to the top of the ridge, to take up overwatch. The copter's rotors whuffed to a higher pitch and it lifted straight out of the middle of them before sliding down the hill at an altitude of about 10 feet. Cade filled his vision with the feed from Cat 4 and did a slow scan as the whuffling sound of the copter slid away into the cool night. No light anywhere, and no sound except what little the team was making. Watching Cat 4's biometrics closely Cade saw no signs of danger response. He couldn't interpret the smells from Cat 4 with anywhere near the sophistication that Cat 4 could but he could interpret the animal's physiological reaction to the input. Cat 4 felt fine, and safe enough to begin licking her crotch.

The ridgeline ran north-south, one of hundreds in this area. The ground lay like a rumpled blanket of dirt and blocky stone embroidered with long stands of wild apple trees and brush. The target lay out of sight and sound one ridgeline away to the east, a cluster of building at the bottom of a small valley in a clearing.

Cade launched both birds with the sense that there were seeds around here somewhere. Their bios read of quiet satisfaction laced with sheer joy. Birds were always like that. They really liked the air. These two were natives of the lands just a little further south. Cade had received



them from an asset of some sort in the area and infected them with the nano package that let him control them as well as pull down a full feed of what they saw, heard, and smelled.

Captain Legan said, “Jake. How’s the link?”

“It’s up and strong. Doesn’t seem like anybody’s seen any of the aerostats yet.” Jake had his own heads up display giving him a full maintenance and control feed from the long string of aerostat swarms that stretched over five hundred miles back to the team’s staging area. They went undetected by the radio sniffers everybody put out to prevent operations exactly like this one by using collimated laser links to communicate with each other as well as a good stealth package.

“Recon, report.”

“Nobody in the area, Captain. Route alpha is clear for at least a klick and Bird 1 is in good shape.”

“Curly.”

“Roger, Captain.” Curly stood up to take point and began making his way diagonally up and across the slope of the ridgeline. He was making for a stand of head high brush that would allow the team to cross the ridge without skylining themselves. The rest of the team spread out in a diamond with Brooks and Jake on the flanks, Mango at the rear, and Cade and the Captain in the center.

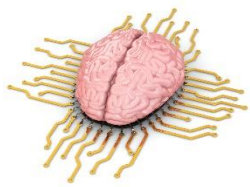
Cade used Bird 1’s natural magnetometer to get it moving as fast as it could toward the target five klicks away. With the same mechanism he had Bird 2 flying lazy circles up high, examining the route ahead of them and dead spots around them. Cats 1-4 mirrored the diamond formation the team was using but spread out by over a hundred meters, guided by moving spots of curiosity the AI generated in their minds. Cade couldn’t look at all the feeds simultaneously while he was walking but he’d programmed his own variations on the “AI” that helped him filter, sort, and interpret the data that was coming from the animals to alert him if they became aware of people or man-made items of any type. Suspicion and heightened alert were pretty easy patterns to identify in animals.

About a klick later the team was moving through the low ground of a small valley when Cat 2, on the left flank, went into panic mode. Cade held his flat hand up and the team sank to the ground, disappearing into the grass and bushes.

Captain Legan muttered into the link. “What’s up?”

“Wait one.” Physically, Cat 2 was still fine, though agitated. Looking at his feed, Cade could see that Cat 2 was deeply focused on a small dog like animal that reminded him of a coyote. It was hunting Cat 2 and had her scent. Cade said, “Predator.” It happened.

Captain Legan snorted and rose to his feet along with the rest of the team. “Run it off?”



“Yeah, Dog’ll have no problem.” The predator was less than half Dog’s size.

As the team started moving again Cade let Cat 2 have her head. He put a geo into Dog’s mind and let him go with the command to hunt and bite anything that wasn’t a cat. Dog raced silently off into the brush. Cade minimized the visual feed from Cat 2 into the bottom left corner of his vision. Dog lanced into view like a furry torpedo and the predator bolted. Cat 2 immediately began to relax and went back to trotting on the perimeter.

Dog chased the predator with his typical straining and eager intensity but Cade pulled him back, giving him a sudden powerful urge to defecate to get him to stop and then the idea of food with Cade. A few minutes later, after giving Cat 2 a sniff and a lick, Dog trotted up and heeled Cade again. Cade gave him a treat.

Captain Legan halted the team in a thick copse of trees smelling powerfully of rotten apple at the base of the last ridge between them and the target compound. Cats 1, 2, and 4 swept the ridge above them. Cade pulled Cat 3 to him and fed him a real morsel instead of the phantom pleasure morsels he’d given the others. They were all a little footsore. Four and a half clicks was not a distance that cats normally traveled in one long go. Cat 3 was a big brindle tom though and in a fine mood. He pushed his head up under Cade’s hand, rubbing, before he ate the morsel. Ponzy reached over and gave Cat 3 scratches while Cade unshipped the rats and the harness.

Birds 1 and 2 circled the compound while Captain Legan examined their feeds in his HUD. “There are a lot more vehicles than we expected. I count five.”

Ponzy muttered over the link. “Yup. We got ID on any of them?”

“Get me a closer look, Recon.”

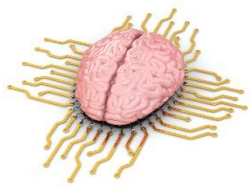
The vehicles were clustered in the larger of two yards bracketing the buildings. The compound sat in the middle of a long open space at the bottom of its valley. As the ground rose on either side of the valley trees appeared and thickened into a heavy blanket along the top three quarters of the ridges. The road servicing the compound came in a straight line from the north and continued in a long curve to the south along the bottom of the valley after widening out at the compound.

Bird 2 glided in and landed with a soft flutter of wings on top of the wall surrounding the yard with the cars. Cade directed its attention with the promise of grubs at the license plates, moving until it had seen them all.

Captain Legan said, “You getting this Jake?”

Jake grunted an affirmative.





As Cade went back to securing the harness with its two rats on Cat 3 Jake said, “Holy @\$%. There’s a hit on one of the big black SUVs. It’s associated with the security forces of Abusaid Yandarbin.”

Legan said quietly. “Is it his vehicle?”

“Can’t tell. The other two aren’t in the database but they’re pretty obviously a set.”

Cade recognized the name. Yandarbin wasn’t an Osama but his name came up regularly in the INTSUMs as a major facilitator. He often traveled with 3 or 4 young girls which he joked were his “shield.” He was on the list, near the top.

“Ok, we proceed as planned. Doesn’t matter if we’ve got an HVT here, first priority is still Surveillance and Reconnaissance. Higher wants to know what they’re moving through here. Recon, you ready to launch yet?”

“Yeah. Launching now.” He urged Cat 3 away, carrying both rats in the harness. Cat 3 would carry the rats close enough to the compound for them to get in and be useful. With the view from Bird 1 Cade chose a low finger of bushes that stretched from the tree line to pretty near the compound and gave it to Cat 3 as a geo. The software could handle guiding him into that vicinity.

Cade reviewed the data from the other three cats. “Ridgeline is clear. No security, no cigarette smell, no trash.” As he spoke he launched Bird 2 back into the air in a quiet glide from the top of the wall and up into a tree on the far ridgeline that suddenly looked like a good place to sleep.

Captain Legan said, “Curly, let’s go.” Curly rose to his feet and led the team up slope to the military crest on the back side. They weren’t directly above the compound but half a click to the south along the gently curving ridgeline. Brooks, Mango, and Ponzy shed their packs and began clipping brush for a screen while Dog and Curly pulled security.

Cade kept the two birds and three of the cats focused on the compound. Captain Legan had him move them around here and there trying to complete the picture.

Once Cat 3 reached the bushes stretching from the treeline, Cade had him stop and hide. Once he went still Cade put him to sleep. With Cat 3 thus immobilized he sent the command that would release the harness to fall off of Cat 3 and free both rats to scurry into the compound itself. Cat 3 slept until they were out of sight.

Lights blossomed in the compound as a door opened on the biggest building, which Legan had labeled “A” on the Ground Reference Guide he was building. Music floated out into the night along with the smell of hashish and cooked meat. All the cats reflexively froze in the trees above the compound, staring at the light.



Jake muttered, “@#\$\$” over the link. “Boss, higher wants to talk to you.” Cade’s attention snapped off of the feed from Cat 3, back to where he was actually sitting on the ridgeline.

Captain Legan flipped over to the proper channel, his low voice quiet in the night. Cade could hear him through Dog. Likely nobody else but Jake could. “Yes, sir, six of us and a recon enabler. ... Yes, sir. ... understood, sir.” He came back on the link. “We’re gonna hit Yandarbin. R.O.E. 2.”

“Roger that,” the team replied, satisfied anticipation thick in their voices.

“Brooks, I want you in that rock pile.” The rockpile was on the same ridge but closer to the compound.

“Recon, I need to know which of those building’s Yandarbin is in.”

“Working on it.” Cade dove back into the feeds. He was pretty sure building C was actually a garage/toolshed. He sent Rat 1 skittering toward it with instructions to get inside and find food. Rat 2 he sent toward the building where the music and light had come from. Cat 3, awake again, he pushed toward the cars to determine if someone was in any of them. Cats 2 and 4 he drew toward the buildings. There didn’t appear to be any guards posted but if that changed he wanted to know about it.

Impossible to get a bird inside a buildings without a stir so he flew them with promises of a warm updraft to where they could cover the avenues of approach, up and down the road.

“Jake, I need a picture of Yandarbin.” A picture of a thick balding man with a heavy beard popped up into Cade’s HUD. He pushed it to the very edge of his vision where he could reference it.

Bird 2, on the southern road, saw a light out of sight around the bend. Headlights, three pairs, moving toward the compound. Cade called the Captain’s attention to it.

The Captain said, “You in place yet Brooks?”

“No. Two minutes.”

“Hurry up. Vehicles approaching.”

Jake hissed into the link, “Sir, Higher says Yandarbin is due to meet another HVT tonight. They didn’t know where but now ...”

“Who’s he supposed to meet?”

Jake snarled, “They won’t say yet.”

Cade raised his eyebrows in the dark. Bird 2 buzzed the high-end electric vehicles, black or dark blue and another matched set.



Captain Legan said, "Not local. Wait one." He flipped over to higher's channel. "Is Gulnaz approaching my position?... I don't care whether you're authorized or not, confirm or deny. ... Ok." The tone of his voice changed. "Hello, sir. ... Yes, sir, we can take him. ... Understood, sir."

Cade huffed. Gulnaz was #1 on the list. The vehicle's lights started flashing through the trees to the south.

"Gentlemen, that's Gulnaz approaching our position. We're going to let them link up then hit them all at once. Fit your grenade launchers. Recon, where is Yandarbin?"

Rat 1 had confirmed that building C was an unoccupied toolshed. Rat 2 was in the walls of building A peering through cracks in the crude planks.

"There are three girls and four men in Alpha. None are Yandarbin. I'm seeing A.K.s, nothing heavy."

"Is he in Bravo?"

"Likely. Let me confirm." Cade drew Rat 1 into a sprint toward building B.

Jake swore. "Link's out Captain."

"Are these guys jamming us?"

"No, it's not local. Wait one...it looks like the Tajiks have their laser working again. They've targeted swarm four." Swarm four was one of eight that spanned the distance back to the staging area two countries away. "I hate those damned lasers. They're too easy to repair."

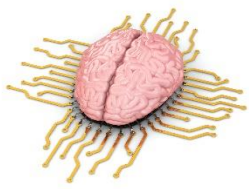
"Yeah, well, at least our ride's still in good shape." The copter was loitering a few miles away in a radar dead zone.

The three vehicles swooshed up to the compound and men climbed out. Two men entered building A. Two others strolled in opposite directions around the outside of the compound. From the third vehicle two more men appeared. The passenger, a pale portly man in a light gray suit, fit the description of Gulnaz. He stood and stretched his back outside his vehicle for a moment.

Rat 1 huddled outside building B. Cade looked around and saw a couple of pipes emerging from the wall of the building. In seconds Rat 1 had squeezed itself through the gap and into the dark room beyond.

Cat 3, crouched under one of the cars in the yard, was looking straight at the door to building B when Yandarbin emerged and shouted something happy to Gulnaz. Without the link to the rear there was no translation. Gulnaz crunched over the dirt and weeds toward Yandarbin. They embraced. It was not a hesitant or cool embrace..

As they re-entered building B, the lights came on and Rat 1 froze. Rat 1 was in the open at the base of the wall. Glancing around, Cade saw he was under a bare bones sink.



Captain Legan put his hand on Cade's shoulder. "Hey, no rush now. We'll give them all a few minutes to chill before we go in."

"Sir, Rat 1 is in a bit of a spot." Even as he said it he heard Yandarbin curse and saw a flash of movement from Rat 1's feed. Yandarbin had kicked at the rat and Rat 1 had bolted. Both men shouted and laughed as they chased the rat around the room trying to stomp on it. Cade's feed was a jumble of quick motion. Rat 1's data feed showed full panic and distress.

The motion stopped suddenly and the visual feed skewed. Gulnaz's face loomed down toward Rat 1, hand reaching out. Rat 1 struggled but was caught, probably under Yandarbin's foot. Gulnaz clutched and lifted. Rat 1 struggled madly, and Gulnaz cursed and grabbed, reflexively pinning the nearly escaped rat to his torso with his arm. Cheap cologne and body odor filled Cade's nostrils. "They caught Rat 1, Captain."

"Well, @#\$. Is it dead?" There was real regret in the Captain's voice.

"Not yet but he will be soon."

"Have him bite that bastard before he goes."

Cade nodded and sent the command. Rat 1 twisted and bit viciously. Gulnaz shrieked and flung the rat across the room. The impact was sickening to watch from the inside. As the signal degraded, Cade could see Yandarbin's face. It was worried, and not really looking at Rat 1. Yandarbin said something to Gulnaz and Gulnaz looked sharply up from his bleeding hand.

Cat 3 saw them both emerge and look out, up into the sky above the compound and around at the ridgelines. "Something's up, sir."

Gulnaz shouted at the two men circling the compound even as he ducked back inside building B. The two men ran to their vehicle and one opened the back hatch while the other started it.

Moments later Cade's feeds went out, all except Dog's, and that one was glitchy.

Jake said, "They just started jamming your frequencies man."

"Just my frequencies?"

"No, the whole band. It's going to affect the internal link too. Break. Brooks, can you hear me buddy? You in place yet?" No response. Down in the compound six men rushed out of building A with rifles in hand. Cade couldn't see where they all went. He felt blind without his bird's eye view.

Ponzy said, "Sir, even if they don't know that we're here they're on the alert. No more surprise."



Legan said, "So? That's Gulnaz down there. We only really have to get *him*. It's worth it even if we have to go in and do them all. If he decides to bolt and drives out of here we don't have the means to reliably stop his vehicle or track it."

Ponzy only hesitated a moment. "Roger that, sir."

"One minute."

Cade shrugged into his pack, mind racing. Six of them against at least ten fighters with no real surprise. Dog would be a big help. Dog! Cade said, "Captain, I have an idea."

"What is it?"

"We can use Dog. We can send him after Gulnaz."

"Not sure enough. He's a good dog, we'll use him in the assault, but he's not a bullet to the brain just by himself."

"You don't understand, hold on." Cade knelt by Dog and felt his belly and sides. Under the fur they were slightly firmer and bulkier than they should have been. "He's got a full load of C5 in there. It's part of the package."

Curly asked, "How much?"

"Two, three pounds? I forget exactly. I never intended to use it."

Captain Legan said, "Not enough. We can't just have him blow up in the compound and expect to kill Gulnaz."

"Right, but I can get him to go after Gulnaz specifically and not blow up unless he's right on top of him."

"How do you expect to do that? Your feed's dead."

"Not completely. The range is severely limited but I can still punch through to Dog while he's here next to me. I can give him the scent. I got it from Rat 1 before it died." Even as he was speaking, Cade was pulling his scent emitters off his face. With the input stone he rolled back the scent feed to the proper moment and then put the emitter to Dog's nose. He spoke the code word verbally at the same time he sent the commands over the degraded link. Dog whuffed and strained at his collar. "He's got it. Should I launch?"

Captain Legan thought for a moment, looking from Dog to the compound he could now only see through a gap in the trees. "Don't launch him yet. Let's get to Brooks first. Let's go Curly."

Back at the rock pile they all hunkered down, pulling security around the base of it. Brooks was up in a gap on top of it. Legan crawled up and spoke to him then back down.

"We'll initiate with the grenade launchers. Brooks will clear the way for Dog. Ready?" Cade nodded. Everybody crawled to where they could see past the rock pile. Their grenades were





launched from the end of their rifles and would use inertial guidance and fin adjustments to impact at the distance specified by the user.

All five grenades were aimed at the building with Gulnaz in it. The bark of the propellant round was harsh in the quiet night. As the grenades arced silently up over and down men began shouting in the compound, reacting to the gunshots.

Cade released the clasp on Dog's collar and it fell away. Dog streaked out into the night toward the compound, disappearing into the trees just as the grenades impacted on the building.

When Dog emerged from the trees on the flat area surrounding the compound, Brooks opened up. At the first crack of his rifle a man pitched backward from the gate and Dog leapt the falling body on his way inside.

Ponzy muttered, "Look at him go!"

Gulnaz staggered alone from building B, which was still standing but listing seriously to one side and gently smoking. Three men leaped on him and moved him quickly into cover of the thick mud wall. Brooks fired and one of the three pitched backward even as the others disappeared.

Dog cast about inside the compound. He caught Gulnaz's scent, turned, and raced behind the wall. A quick string of shots rang out and Dog did not emerge. Seven or eight men started firing up at the rock pile. Rounds cracked around the team. Brooks continued firing. Three girls broke from building A and ran into the woods across the valley.

Captain Legan whispered, "Blow it now, Recon!"

"I can't. He's out of range."

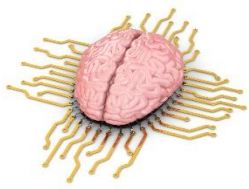
The Captain swore. "We have to get down there." He yelled up to Brooks, "Brooks, shift right! Wait until you hear us firing to start shooting again. The rest of you, we're going to swing left. Hopefully they lose us in the trees. We'll bound from the treeline into that left gate. Once we start shooting Brooks'll cover us."

Brooks slithered down off the rockpile and started into the trees to the right.

Ponzy said, "They're moving."

Gulnaz and two of his men dashed from the compound wall to one of their vehicles. It started up and the wheels churned up clouds of dust as it reversed.

As it started to pull away, Dog emerged from behind the wall, limping toward the moving vehicle. The entire team gasped and Captain Legan said, "Cover him!" They all began firing their personal weapons at the compound, trying to keep the other fighters from noticing and shooting Dog.



Captain Legan shouted at Cade, “What did you set as the trigger?”

“Bite on target.”

“Does Dog know Gulnaz is in that vehicle?”

“Yeah, I think he does.”

Dog was picking up speed even as the vehicle did. He stopped limping entirely and stretched into a flat out sprint after the vehicle. The vehicle had to slow just a touch, brake lights flaring as it crossed the streambed.

Dog was a torpedo. He caught up with the vehicle, mouth open, and disappeared in a flash of light and fire. The SUV surged into the air, breaking into pieces and engulfed in roaring flame. It came to rest a shattered and hollow shell, in pieces and on fire. One by one its batteries started cooking off, blowing it into smaller and smaller chunks.

The firelight lit up the valley, dancing on the trees and the building. The shooting from the compound had stopped for the moment.

Ponzy spoke into the silence. “Let’s get the hell out of here.”

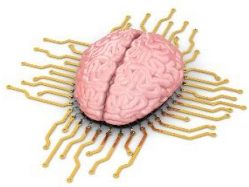
Captain Legan said, “We’ve got two hours before the copter hits the exfil site on automatic. We can make that if we hustle. Curly, let’s go.” Curly led the way down the back side of the ridge through the trees.

As they walked, with the jammer a fiery wreck along with the vehicle, Cade put Bird 1 and 2 on station overhead. He simply released Rat 2. Cats 1, and 2, who had been on this side of the valley, he pushed out a couple of hundred meters, one in front and one behind. Cat 4, on the far side of the valley, he just told to try and catch up. If she caught up he’d figure out what to do with her then, probably carry her. If she didn’t he’d release her as well. Cat 3 had been next to the building when the grenades landed.

The team moved through the apple trees at a good clip. There was no pursuit.

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SFC Ethan Skarstedt is MID NCOIC for 1/19th SFG(A) of the Utah National Guard as well as NCOIC of the SIGINT training activity at the Draper, UT foundry platform. He has three combat deployments with the 1/19th as a SOT-A team member and SOT-A team leader, OIFx1 and OEFx2, serving with 19th, 3rd, and 5th Group ODAs. He has participated in training and foreign internal defense operations in Korea, Senegal, and Germany. He has been married for 21 years and has 5 children. He has previously published two short stories, one as a co-author with Brandon Sanderson in the anthology ARMORED from Baen publishing.



Boudicca  
By Hal Wilson

Max Ramsey was getting old, and he knew it.

The sun's golden glare was upon him. Standing to attention in commercially serried ranks, slender pines surrounded him as they awaited harvesting. Yet there was scant shadow on the forest floor. The summer heat burned relentlessly through the meagre boughs above, so the rich brown of the trunks somehow blurred into the sandy khaki soil underfoot. Down here, verdant green ferns singed amber in doomed battles against the sunlight. Every movement and every whisper of the wind raised lazy clouds of gauzy dust from the parched Baltic earth.

Ramsey paused to take a breath, leaning against a ubiquitous pine and mopping his brow. His Digital ear and eye ached from the heat, summoning unpleasant memories of losing the originals in Helmand. His debonair days were long-gone: Dashing youth had lost to children, mortgages and divorce from a wife that said he loved chasing news too much. She was right, admittedly. But the job still took him back, still made him feel young and invincible.

It made him forget his shrapnel-scarred jaw, his beer paunch and crushing disappointment in himself. Listening to the *crack-boom* of artillery echoing through the woodland, he felt the years fall away, like weights lifted from his shoulders. He was lucky, he knew. Journalism – his first love – was dying. And yet here he was, paying alimony and tuition by witnessing Russia's latest war. How many others could say the same?

Drawing strength, he continued along the dusty forest path to the sounds of the echoing cannonade.

Rounding a low hill, he spied two armoured vehicles. Cast in ochre-beige hues, they hugged the earth like lounging predators. Toggling its zoom function, Ramsey's Digital eye granted him a closer look. *Strange...* Their exhausts were mute, he noticed. Soldiers milled aimlessly around them. But their tell-tale flecktarn battledress revealed them as Germans. *Good*, he breathed.

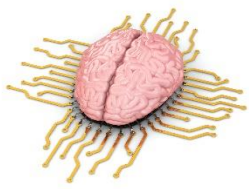
Ramsey saw no perimeter security, but he approached with arms raised. He held his E-Paper in one hand, its flexible screen coiled like a Roman scroll. He reached down to the Press lanyard around his neck, revealing the embroidered Union Jack velcro-ed to his body armour.

"Stopp! Stehen bleiben!" called out a sentry, rising from the dying ferns like some Teutonic apparition.

"Press! British!" Ramsey answered. Another sentry appeared, advancing with rifle ready.

The soldier snatched the pass while Ramsey's Digital ear translated the German's chatter, transforming sing-song Bavarian into mechanical English:

"*This idiot is for real*," the German said. "*How did you get here, British?*"



Ramsey ignored the soldier's jibe, slowly un-scrolling the E-Paper and using his pen to tap out a message. An app instantly translated into stilted German:

**My fixer ran off. I need help; I must speak with your commanding officer.**

Swayed by his accreditation, the dubious sentries took Ramsey into their position. More Germans were ensconced all around, each sharing dejected, angry looks. Some lounged carelessly, others argued in hushed tones. Ramsey used his Digital eye to Blink a photo of the scene, saving it to the eye's hard-drive. *Why aren't they supporting the American counterattack? They weren't sent out with black-painted broomsticks again, surely?* Ramsey tried to access his remote feeds, flicking his eye to bring up menus overlaid on his field of vision.

*// CONNECTION FAILED. PLEASE CONTACT YOUR SERVICE PROVIDER. //*

He cursed. Russian jamming had been playing with his connection all day. But it was sporadic. It was as if they were flailing randomly, unsure of which channels to shut down forever. He rechecked his anti-virals for the hundredth time: the last thing he wanted was some FSB hacker using him as an aiming point. Ramsey's escorts took him to the armoured vehicles, where an officer half-heartedly berated his juniors. The officer swiped a hand brusquely – scattering his audience like scolded schoolchildren. Ramsey noted the officer's name tab as he faced them - HOLGER.

"*Who is this?*" Holger demanded in German.

Holger was barrel-chested but deflated. His shoulders were slumped, his face ashen and wan. His chest rig carried a Hauptmann's three pips, but he seemed weighted more by defeat than responsibility. Ramsey's E-Paper was already translating for him:

**I am a British reporter. My guide abandoned me. Why are your men not engaged?**

Holger's jaw stiffened as he read the note. The sentries went scurrying after another curt flick of the wrist.

"I speak a little English," Holger said, beckoning for Ramsey to follow. They walked back towards the lonely forest track that Ramsey had just taken.

"You should not be here," Holger went on, "this is a dangerous place."

"Never mind me," Ramsey replied. "Are you waiting in reserve? Shouldn't you be supporting the American brigade?"

Holger stopped, dust billowing around his boots. Ramsey stifled a surprised look - his Digitals had just re-established contact. Holger's mouth twisted silently. Was he struggling to find the right words, or the right excuse? Ramsey focused on the feed as Holger hesitated.

*// Welcome back @MaxRamsey90 //*

*// You have:*

*... 90 Notifications*



*... 78 Unread Emails  
... 13 Missed Calls... //*

Ramsey went direct to his notifications. He had to know what his counterparts in the local area had learned. He scarcely went through the first five before he stopped cold. An old friend from his Afghan days, Donald Lynn, had dropped a bombshell:

*// @therealDonaldXLynn: WITNESSING GER. 101 PZ.GREN.BAT TROOPS SURRENDERING TO RUSSIAN FORCES. CAN ANY1 IN THE AO CONFIRM IF WIDESPREAD? APPEARS PRE-ARRANGED.  
//*

"We will not be fighting," Holger finally stated. The German studiously avoided Ramsey's gaze. "Your *unit* will not be fighting?" Ramsey shot back, his attention shifting away from the feed. An awkward silence fell between the two men. "The *Germans* will not be fighting," Holger said, "It is a political thing. You must leave now, this is a dangerous place." Ramsey looked into Holger's eyes this time, finding the kindled embers of shame, dismay, fury. His EPaper was up instantly, jotting urgently:

*// @therealDonaldXLynn Confirmed, pal. "The Germans will not be fighting" – Ger. Officer I just spoke to. No Russians here yet, just idle troops. //*

He tagged up his Blinked photo of the German unit and shot his warning out into the aether. Suddenly, he became aware of barked warnings from hidden lookouts.

"What was that?" Ramsey asked.

"One of your tanks approaches," Holger explained, "You will leave with it."

An armoured vehicle roared into view, trailing a thick cape of dust. The mantle of powdered soil swallowed them, forcing them to cover their eyes and leaving Ramsey's tired old lungs spluttering. His ears were filled with a diesel's guttural growl, shelving into a high, animal whine as the vehicle idled to a stop. Ramsey looked again as the dust cleared.

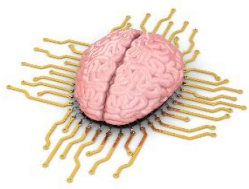
A light tank squatted before him, rocking gently on narrow tracks. Its flank carried the golden sword-crest of the British Army of the Baltics, a stark contrast against its drab olive skin. Enwrapped by slat armour, it seemed all out of proportion: The turret looked unusually small, tipped as it was by a long, narrow cannon and skirted by six boxy, bolt-on canisters, themselves slanted at rakish 45-degree angles. The cannon shifted furtively, as if catching their scent.

*I know that design, Ramsey realised. I've seen it before.*

A cupola *clanged* open, and a figure emerged from the strangely familiar machine.

"You in charge here?" the figure asked in southern England's clipped accent. "Will you fight?"

"We have orders," Holger answered with exaggerated formality, "My battalion must obey. This man is a British journalist. Will you take him with you? I cannot offer transport to your people."



Ramsey looked closer at the tank commander, realising it was a *she*. She had a mop of auburn hair tied back in a severe bun; her face was framed by the halo of a radio headset. Her eyes shone with bright disdain as she glowered down at them. *A modern Boudicca astride her chariot*, Ramsey mused. He Blinked her for good measure.

"Get in," said Boudicca crisply, "You might just fit."

\*\*\*

Using the tiny rear hatch, Ramsey climbed into another world.

Fierce heat and light gave way to dim, air-conditioned cool. The forest's breathless scent yielded to the stink of oil, sweat and fuel. Narrow seats hung from roof-mounted pistons, where the tank commander and another crewman perched uncomfortably.

"Get in already, for @\$%'s sakes," Boudicca hissed, clipping on her bowl-shaped helmet. With the cupolas buttoned up, the last streak of sunlight died as Ramsey closed the hatch. The second crewman offered a spare headset as the driver revved the engines. The cramped interior thundered with oppressive noise.

The crewman plugged Ramsey's headset into the tank's hard-wired internal channel.

"...still reckon we ought to slot those kraut bastards. What do you say? A bit of RARDEN to spoil their day?"

"Enough, Silver," said Boudicca. "Get us back to the Brigadier's CP. Don't spare the horses."

"Roger that." As if skating on ice, the tank span on the spot before jolting the way it came.

Ramsey fumbled for a handhold in the dark, unfamiliar space.

"Alright civvy," Boudicca snapped as she turned from her periscope. "You're in my wagon now. Don't mess with my crew and I won't throw you out."

"Who are you?" Ramsey asked, crouching like a hunchback to avoid striking his head.

"I'm Lieutenant Tanith, Royal Berkshire Hussars. This here is Corporal Warwick. Trooper Silver up front is our driver."

Ramsey acclimatised slowly to the gloom. He made out an ammunition rack slotted between Tanith and Warwick. Above it was the reassuring bulk of the cannon's rear mechanisms. Just adjacent to Warwick was a miniaturised computer - the only thing that looked relatively new to Ramsey's eyes. Its screen was conformal to the turret's curve and glowed at low-light settings. Everything shook from the cacophonous engine, or bucked with the tank's passage over rough terrain.

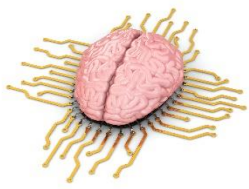
"Lieutenant," Ramsey went on, "Why are you here? Isn't the British sector further north?"

"It is," she shot back. "But the yanks got smashed and the krauts just surrendered. We were on a recce to find *any* Germans still resisting."

"It's time for a second Dunkirk, buddy," joked Silver from his unseen driver's position.

"Shouldn't you be calling this in?"





"The Russians compromised our Bowman radios," Tanith explained, "so we're back to Wellington's way of doing things. Glorified bloody courier service."

A hush set in, as if each mind were turning over the implications of the German surrender. Despite Silver's joking, they all knew that the Russian noose was tight. Ramsey couldn't bear the pregnant silence; he let tension drive a question of out him.

"Listen, Lieutenant, didn't they use this tank in Afghanistan?"

"Yeah, Scimitars went to Afghan," Tanith said absent-mindedly, preoccupied with her viewfinder.

Ramsey's chest was gripped by sharp panic. He *did* know the design from before. *Scimitars*. He'd seen them on patrol in the weeks before losing his eye and ear to a Taliban mortar. They were already old then. They were *ancient* now.

"Jesus. They've been using this tank for, what? *Sixty years*?" Ramsey quailed.

"I know," Tanith said in deadpan, "try maintaining the bloody things."

Her frosty tone convinced Ramsey to try again with his feeds. He sighed with relief that his connection was still active, and that his old friend Lynn had written back to him:

*// @MaxRamsey90 Good 2 hear from u m8. Germans def out the fight now. Be advised RUS def at or en route 2 #Tabimusti #Kurgi & #Valmere, stay safe. //*

"You guys," Ramsey started, "Do the places Tabimusti, Kurgi or Valmere mean anything to you?"

"Kurgi's a town about ten minutes back the way we came," Warwick replied. "Why?"

"I got confirmation that Russians are on their way there, if not there already."

"How do you know?" Tanith demanded, turning to face Ramsey.

"I'm online right now," Ramsey pointed to his Digitals. "A friend of mine just shared a heads up."

"You mean you're linked up with others through that eye? You're all talking to each other?"

"Connection's bad, but sure," Ramsey nodded.

"Thanks for sharing," Tanith shot back, "You hear this boys? A ready-made fix for the Bowman balls-up. We need to get our passenger to the Brigadier no matter what. Corporal, re-task the Mayfly to check--"

"Driver! *Stop, stop, stop!*"

\*\*\*

It was like the Scimitar struck concrete. With a wet *thunk*, Ramsey hurtled into the ammunition rack.

"Infrared contacts on Mayfly," Warwick reported, pointing to his screen. "See those trees at the crossroad? That's a roadblock, sure as sure. And look over there, under that garage roof? Could be a tank... The bastards must just have moved in, else they'd have eyes on the approach road."



"We don't have time for this," Tanith said curtly. "No way we're going around them, or back the way we came if the Russians are at Kurgi." Neither of them spared a look at Ramsey, who spat a skittering tooth as he groaned to his feet.

"Silver, you see that dead ground up ahead? With those birch trees in a line? Advance to there, nice and slow." The Scimitar grumbled into life again.

"What's the plan?" Warwick asked sidelong. Nervous sweat broke cover and fled down his cheek.

"Still got those red smokes, Corporal?" Tanith was peering deeper into the periscope, as if looking for inspiration.

"The ones off the Razzman? Right here." Warwick nudged a footlocker.

"Chuck them over. See how the land keeps dipping, and the trees get thicker before the crossroads? I'll use that concealment to move in. The Mayfly'll never get an angle to see under that roof – and we are *not* running this gauntlet until we know what we're up against. I'll get in and pop the smokes if there's a tank. If you see smoke, hit the building where you saw the tank hiding. And the roadblock. Use *all* our Mayfly canisters. Don't hold back. Got it?"

"That's a long run, Lieutenant..."

"The smokes and the Mayflies will cover me. I'll hustle back here and we'll give it full chat straight through the roadblock. Got that Silver? Don't @\$% up the gearbox this time."

"Roj, boss."

"Remember: the Brigadier *needs* our report, not to mention this guy and his augs-" she jabbed a thumb at Ramsey, "to get a handle on this disaster. That's what matters here."

Tanith levered herself out of the Scimitar, hauling the cupola shut after her.

"What are these Mayflies you're on about?" mumbled Ramsey, fingering the bloody gap left by his absent tooth.

"They're the drones we hump around. Cheap way of getting a troop of four wagons to be everywhere at once."

"And they attack things too?"

"Yeah: explosive nosecones. It's the dog's bollocks, mate. They'll @\$% up the little green men over yonder, but cross your fingers on the tank. If it's an Armata we'd need a Chally to dent it."

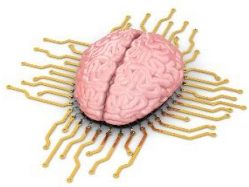
Ramsey faintly remembered 'Armata' was some kind of Russian tank – but he had no clue about 'Chally'. Still, he decided against more questions. Instead, he clambered up to Tanith's perch.

"You know what the worst part about this is?" Warwick asked suddenly. Ramsey realised the question was for him.

"What, besides that we're losing?"

"No," Warwick chuckled at the gallows humour. "Last we heard a German platoon was guarding this junction. Bloody krauts, man." Ramsey grimaced but found escape in Tanith's viewfinder.

The Scimitar's periscopes were old-fashioned, lacking a port for him to plug his Digital eye into. So he placed his cheekbones against the viewfinder's grey plastic face-cups, as if at an optician's appointment. It was like squinting through a letterbox, but the sudden colours were a shock after the Scimitar's gloom. The rich green turf bowed flat under a stiff wind. The blue sky above



tinged granite by towering smoke plumes, or else starkly scarred by bone-white contrails. The bitter coral flames of a fierce forest fire devoured the eastern horizon.

Compulsively, he Blinked a photo. He tabbed it up to his still-live connection, and rushed a quick message.

*// @MaxRamsey90: Looks like the end of the world from here. RUS units occupy town abandoned by Germans: Hell to pay at next @NATO meet. //*

Ramsey looked again through the periscope. The Scimitar was hidden behind a gentle knoll, topped by a low stand of birch trees. The forest had yielded to undulating farmland while the dirt track had become a paved road, sitting just on their right. The road ahead curved through clumps of trees to reach a lonely hamlet, a simple handful of buildings clustered around a T-junction. Ramsey spotted no Russians, but he saw the road on the far side of the hamlet was lined with thick, reassuring conifers. Thick enough to perhaps hide them as they ran through the other side. The ground to their left was little better than swampland: No wonder that Tanith decided they had to push through.

"And now," Warwick sighed, rolling his stiff neck, "we wait."

\*\*\*

Red smoke.

*Red smoke!*

Ramsey gasped. Scarlet bloomed in thick, viscous billows over the hamlet, like lifeblood in water.

"Silver!" Warwick bellowed, "She did it!" He was already hunched over his console, his back concealing his work.

"Standby for five rounds. First Mayfly going up in three, two..."

The aluminium hull exploded with intolerable noise, quaking the marrow, shaking eyes in their sockets. Ramsey screamed involuntarily from the howling that tore through the headset, shocked into wordless terror. *Were we hit?*

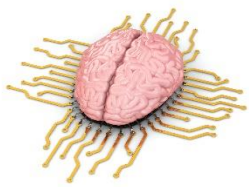
Silence struck, seeming as unnatural as that plaintive, harrowing howl. The Scimitar shuddered on its tracks, as if sharing Ramsey's fright.

"Clean launch," Warwick said with mechanical calm, "standby for second round in three..."

Ramsey gritted his teeth.

*Howl-shudder. Howl-shudder. Howl-shudder. Howl-shudder.*

"Rounds complete," Warwick reported, "Canisters empty." Driven by morbid curiosity, Ramsey lunged at Tanith's periscope. He had to see what caused such deafening noise.



The Scimitar was wreathed in funereal smoke. The once-lush grass around it was crisped into carbonised black. But above, Ramsey could make out the vaunted Mayflies. The last was just now ejecting strange, rectangular components - *Disposable rockets?* - and climbing swiftly. Its profile stood out in sharp relief against the sky: A javelin nosecone with odd delta wings, each flank carrying a small propeller engine. They moved surprisingly swiftly: The zoom on Ramsey's Digital eye struggled to keep up. He barely tracked them as it was, watching as they swirled and danced in random patterns.

"Mayflies engaging," said Warwick. Ramsey barely registered him, enthralled by the drones.

Like the Stukas from Ramsey's half-forgotten history classes, they rolled belly-up and dived in perfect unity. They raced one another with the sinister, suicidal grace of lightning bolts, slick blurs of motion rushing downwards, downwards, downwards...

The Mayflies reached out to touch the earth and, abruptly, a home burst into a blizzard of brick dust and matchsticks. Ramsey panned his view. Another house evaporated. Searing shockwaves played ghoulish ripples among the vaporised debris. Some sort of vehicle - *a jeep?* - emerged from the blizzard, flipping end-over-end in an improbable airborne ballet. He panned again. *There!* A figure ran from the devastation, staggering desperately as each shockwave overtook it. "That's Tanith!" Ramsey yelled, surprised anything was surviving the maelstrom. Head down and legs pumping, she crested the first rise at the hamlet's edge.

"I see her," Warwick echoed. She disappeared as she came down the reverse slope, concealed by the next rise in the ground.

"All set to go here," Silver chimed in over the intercom.

Tanith re-emerged at a sprint on the crest of the second knoll. Ramsey found he was grinning, the pain of his lost tooth forgotten. *She'll be the core of my story after this. A second Boudicca, defying Ivan...*

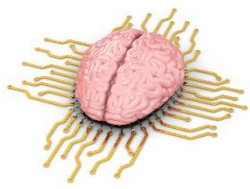
"Bloody hell!" Warwick blurted in surprise. Unlike Ramsey, he was watching the hamlet. Another armoured jeep came racing out of the smoke and ruins. Lustreless green and shrapnel-flecked, it barrelled after Tanith like a bloodhound. A masked man emerged at the jeep's roof hatch as it crested the first hill, bringing a machine-gun to bear. Tanith ran regardless, as if she sensed death were on her heels.

"Do you see that jeep?" Ramsey cried, only now spotting the threat. Warwick was already transfixed by his viewfinder. Without looking, he worked the turret traverse and old-style, wheel-spun gunner control.

"Standby, firing!" The Scimitar gave a sharp triple-cough, spitting three casings onto its front surface, and three 30mm rounds downrange.

Angry red tracer arced calmly towards the Russian vehicle. Ramsey watched their passage with desperate hope... and moaned in despair as the shots went awry. The first two sailed into the hamlet, the third erupting in a spume of earth alongside the jeep.

"@#\$%^' sakes" snarled Warwick. He snatched another clip of three red-tipped rounds from the rack. In one expert motion he slapped them into the cannon's receiver above, the clip



locking in place as he span the gunner control wheel. Warwick and the Russian fired simultaneously.

The Russian burst snatched Tanith cruelly as she crested a third hillock.

Chest hazing red, Tanith dropped like a marionette with cut strings and disappeared into the hill's long grass. Warwick's rounds struck a second later. The Russian jeep crumpled explosively, as a child smashes an ill-favoured toy. Warwick swore, punching the turret hard enough to leave blood.

"Trooper Silver," Warwick snapped, "the Lieutenant is down. Get us moving."

"What?" came the incredulous reply.

"Remember what she said: This guy's our new Bowman. So we get him to the Brigadier no matter what. *Now do as I @\$%ing well told you.*" Silver complied, spurred by shock and Warwick's sharp tone. Ramsey fancied he could see a final flash of Tanith's hair, a feeble patch of auburn. It was static against the swaying green. His heart sank.

Boudicca was gone.

\*\*\*

Roaring, the Scimitar sprang forward like an eager colt. It bounded the low knoll that concealed them, shattering the slender birches in their path. The ejected casings flew from the hull as Warwick slammed another clip home. Pitching forwards on the far slope, the tank immediately bucked upwards as it mounted the road. Holding tight, Ramsey tried to scan ahead through the periscope.

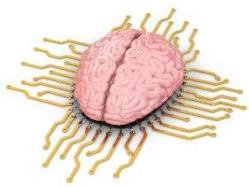
The hamlet was devastated. Shattered homes spilled their guts onto the road. Cars blazed like funeral pyres. Shimmering dust mixed with the thick scarlet smoke to conjure some nightmarish vision, leering ever-closer as the Scimitar gamely ate up the final stretch. The hull suddenly *spanged* repeatedly, as though some determined soul was forcing entry with a spanner.

*Gunfire?* Ramsey panicked. *How could anything survive those drones?*

"Contact!" Warwick growled as he unleashed the cannon once more. Ramsey watched the corner of one house disintegrate, a pair of figures falling apart as roof debris crushed them. Others tumbled in disarray from the smoke, running for cover or leaping to avoid the Scimitar's hungry tracks.

Ramsey shouted a warning as one more Russian sprang from some roadside trees. Ramsey saw the man with unnatural clarity, ingrainning him into his memory: Dark hair. A wide face. Flat green fatigues. Left arm pitched backwards, ready to hurl a grenade. The cannon barked, and a heartbeat later the man and the trees around him were destroyed. But not before the grenade was flying. It burst above Silver's cupola, shattering the vision block of Ramsey's periscope. The Scimitar's aluminium skin rang with the mad *clatter* of a thousand shrapnel strikes.

"Silver, report!" Warwick barked as he fumbled to reload.



"Still here!" came the terse reply. The driver revved the diesel defiantly, as if taunting fate.

With his periscope blinded, Ramsey's world retreated to the confined guts of the Scimitar. But he could imagine them blundering through, whorls of red smoke eddying around them as they raced to the other side.

"We're through!" Silver announced with palpable joy.

Warwick punched a trigger, filling the interior with one final set of blasts.

"Smoke grenades launched," he said, "Silver, mate, get us beyond that ridge up ahead. Between our smoke and the trees we should be screened for now."

"That was too bloody close," Ramsey breathed, waves of relief crashing over him.

"I didn't say we're *safe* yet," Warwick warned.

"Listen, I want to write about your Lieutenant," Ramsey persisted, "We'd never have made it but for her."

"Mate. *Shut up*. Or I'll lamp you."

\*\*\*

Warwick was right about the Russian tank in the hamlet: One of them *was* hidden there. And they really *did* need a Challenger tank to kill it.

Lieutenant Mikhail Azarov and his T-14 Armata had weathered the surprise attack completely unscathed. The Armata was the zenith of Russian tank designs, a true privilege to command. To boot, this one in particular was practically fresh off the assembly line in Nizhny Tagil. The Armata's oblique hide shrugged off the bombs the Americans had just dropped as if they were a light rain. (It had to have been Americans behind this madness. Who else would race a lone tank through this position?) But their accompanying paratroopers had been shredded.

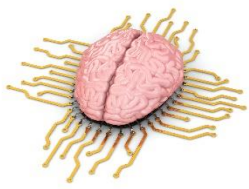
Too late to avoid tragedy, Azarov had just received a flash warning from Information Troops Command:

*// Be advised. NATO social media post geo-located to a hill overlooking your position, due south. Take immediate countermeasures. //*

Azarov sucked air through his teeth, silently cursing the ITC knuckle-draggers. His war had gone smoothly until now. When they entered the hamlet just fifteen minutes ago, all went as agreed in advance: The Germans at the junction laid down their weapons and mounted lorries to be taken off the battlefield. For their part, the paratroopers were just about to detail observation posts in the hillocks.

He listened with mounting anger at the casualty report over his radio. The paratroopers came from Pskov, whilst he and his crew hailed from near Volgograd. But they had grown close in the pre-invasion exercises, and to hear the tally of familiar names was galling. They even said Popov had even gone down throwing a grenade, the old fool.





"Sergeant Ilyukhin," he called out to his gunner, "Do you have them?"

Azarov was watching through the LCD screen slaved to one of the hull-mounted cameras. The fleeing little tank was fast, and well-hidden by the conifers. But its infrared profile stood out by a country mile.

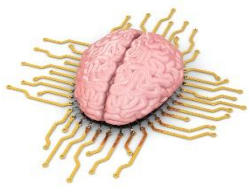
"Ballistic calculations complete on the firing computer," Ilyukhin replied lesurely, "I doubt we need the Vacuum-1 sabots for this shot, Lieutenant."

"Agreed. Sergeant, load HE-Frag and shoot."

END

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Hal Wilson lives in the United Kingdom, where he works in the aerospace industry. He graduated in 2013 with first-class honours in War Studies and History from King's College, London, and was twice a finalist. <http://artoffuturewarfare.org/2016/11/the-cod-squad> and <http://artoffuturewarfare.org/2016/05/the-flying-circus/> in the Art of the Future Project's writing contests. He has also been published by the Centre for International Maritime Security, and is working to release a Cold War-themed naval warfare board game.



CARETAKER  
By Michael J. Martineck

A city without lights looked wrong, Echo thought. Like a field gone to seed. A place in need of some attention, which he had come to provide. Starting now.

They called it the lid. A four-rotor drone his team rode over the skyline like a magic carpet. In training, it was fun. Tonight, jumping off and onto a rooftop that had not been prepped, ‘fun’ fell short.

Echo righted himself, knelt, held his breath and tried to listen through the rush of air. The drone’s electric motors had none of the rumble of a turbine engine. Still, chopping air made noise. So did dropping things.

A thump and crackle to the right. He glanced over, his faceshield clear to let in all the light available. He saw Charlie tucked tight. Barely. A soccer ball, done only in black. Two more thuds. Bravo and Delta hit and rolled. They stopped, heads up and alert, bodies low, the team formed a square, with room in the middle for the last delivery.

‘Invisible, impenetrable, intelligent,’ the mission commander had said. ‘Choose two.’

They had decided hours ago to ditch the first one. Echo said “Clear” and made it official.

The fifth crash to the roof made a crunch, a huff and whoosh, air bags busting on impact. They cushioned the sphere inside, making a racket in the process. Delta rolled to the package, a dull gray ball the size of a beer keg. He checked the seating and the ground. No cracks in the roofing material, no visible sign that it might continue its fall anytime soon. He pumped his arm once.

Echo glanced down to the bottom left of his faceshield. A small rectangle glowed orange. Somewhere out in the Gulf of Guinea a naval vessel pumped power into a Tesla array. The power coursed through the air to the relay on the roof. That gray ball – the keg, the team called it - transmitted power to each of the team-members.

They exchanged thumbs up. Echo turned to the doorway jutting up from the roof. A simple steel slab in a wooden frame, like an outhouse, and exactly what they expected, the entry point they saw in the models during rehearsals. He drew his Trident. A flat black slab with



a four-finger hole – an old book shelve the Army dipped in the rubber, he thought the first time he saw it. His new best friend, he thought after an hour of instruction.

Echo turned it sideways and fired into the door lock. A blue laser sliced the cheap steel bolt into small shower of fireworks.

Like on the Mall, in the Capitol, on the Fourth of July, the night a crop duster flew low, spreading a weaponized pesticide onto the thousands gathered. Gassing them, leaving them twisted, treated like weevils unwanted in a field. If the Caliphate of West Africa wanted to solidify a fractured America, they succeeded in one breezy stroke.

General Allison Guin, Deputy Director of Operations, AFRICOM, had been given control of the response initiative. Echo's first reaction – unspoken and hidden – was a grumble. She'd bomb a couple of warehouses on the docks of Freetown and call it even.

Echo learned he could be happy to be wrong.

\* \* \*

Screens over his nostrils split, letting in the hot night air, whiffs of smoke and that sea-sand scent so ubiquitous in this city. Charlie's pure black frame came into view. A seamless, lightless skin. The shadow of a woman on the woman herself. She grasped the swinging door and stepped back. Echo peered around the corner and in. He saw nothing. The filters covering his ears opened and took in the shouts, jostling equipment and the flapping of leather soles. He ran towards the sound and heard Charlie following close behind.

\* \* \*

"They are diffuse through the city," General Guin explained to 32 team leaders standing around a map the size of a pool table. The 3D printer head scooted around the surface, laying down the last of the constructs of the terrain models. "The Caliphate has separated command and control, communications, intelligence and fighting groups. Without a concentrated target, they believe they are safe. They work out of schools, hospitals and clinics, mosques and



churches, and apartment buildings, living alongside civilians. Children. They believe this makes them safe. I believe it makes them a cancer, and we are the cure.”

\* \* \*

The narrow hallway barely fit two abreast, and yet three men managed to jam into the first door way. Three assault rifles pointed up the stairs. Three barrels, three meters from Echo. They bloomed. White lilies, Echo thought. White lilies in the hottest of mid-day sun in his mother’s garden.

\* \* \*

“My father is a cancer survivor,” General Guin had said. She wore her camo duty uniform, with one star on her collar. Six inches shorter than him, and not much older, she could have passed herself off as a private if she wanted. If she didn’t speak. When she opened her mouth, she couldn’t contain the authority.

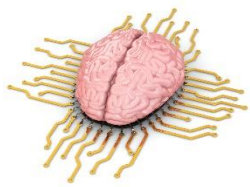
“My father was not saved by nuclear radiation or repeated salvos of chemicals. Nobody flew over him and dropped in the right medicine. He was injected with an oncolytic virus. The virus fought the cancer from inside him. From every angle. And it won.

“‘Virus’ is one of those odd words in the English language. We treat it like one thing, even though it’s made of many, many components acting as one. Like soldiers in an army. Like us. For this operation, we’re going viral.”

\* \* \*

The first bullet struck Echo’s left leg just below the knee. The second shot missed. Seriously? At three meters? The third round hit him square in his chest, over his heart.

A weave of fine ceramic blunted the bullets. An interwoven mesh of hollow carbon fibers collapsed, dispersing the energy through its microscopic ducts. A nano-jet near the small



of his back ordered power from the Tesla, spun up and forced air back through the fibers. They bounced back to full size, ready for the next assault. Two pancakes fell to the concrete steps.

The impact knocked Echo back against the stairs. He didn't fight it. He lay flat. Charlie understood. They'd practiced for this. Three snakes of brilliant blue shot past and over him. Silent. His faceshield darkened as he closed his eyes. He heard a scream from the bottom of the stairs. It may have been three voices in unison. He couldn't tell from the second-long sample.

Two taps on his head gear. Echo leapt up. Trident out. Three bodies half in, half out of the door way, each, in some way, half of what they use to be. Half a torso, half a chest, half a head. Echo didn't let his eyes linger. The men were no longer a threat. He entered the hall ready for the threats to come.

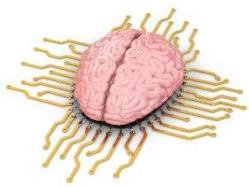
\* \* \*

"The Personal Passive Prophylactic Panoply makes the wearer highly resistant to mechanical energy impact." The civilian stood behind a desk, next to a mannequin in what seemed like a full-body wet-suit. The civilian wore khaki pants and shirt like they had been supplied by a wardrobe department. His beard looked like the first hairs he'd grown. "The P4 makes small arms very nearly useless," the guy continued. "That brings us to the next advancement."

"Something better than not getting shot up?" Charlie quipped.

The civilian smiled. "Something new. If small arms are no longer an effective option for the enemy, they don't need to be the foremost option for you. Carrying 60 pounds of gear into battle? Not a thing. Continuous re-supply of ammunition? Nope. Jams, miss-fires and other failures? Ancient history."

Echo took pride in his professionalism, but he couldn't help himself. His eyebrows jutted out and the left-side of his lip curled. The U.S. Army had carried rifles into battle since before it was the U.S. Army. He crossed his arms as the young man in khaki bent to pick up something from behind his desk.



He emerged with a carbon-black plank, eight inches by 16, he guessed. It had an egg-shaped hole a quarter of the way in. Echo could envision slipping his fingers through, pointing the end of the plank at something. Kind of.

“This is the Trident 12,” the civilian said.

“Trident?” Charlie chirped. “Is this Navy crap?”

“Everyone’s going to want one,” the civilian replied. “A multi-purpose high-energy laser tool. Three lasers actually, hence the name. Depress the trigger and one laser measures your target, a second laser determines air quality between you and the target and helps the tool guess at the density of the target material, that information is provided the third laser. The one with the kick. In excess of a kilowatt, if that’s what the system – or you – determine. We are not talking about a bolt or a beam. The high-energy laser fans. It cuts across while cutting through. Think of it as a saw you can use from 600 yards out. If your saw could cut at close to the speed of light.”

“Man,” Charlie started. “We going to be strapping like 50-pounds of batteries on our backs?”

“Nope,” the civilian answered. “We will send you the power you need as you need it.”

\* \* \*

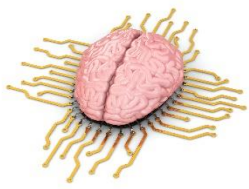
Echo felt the pull to go forward, down the hall. Command didn’t bother with words or signals, they just sent him the urge. A door on the left. Kick. An apartment, lights out, no occupants. Echo backed out and crossed to the door on the right. Another kick, another entry, another apartment. A mass of loose sheets quivered in the far corner. He could discern knees, shoulders and heads beneath from the bumps and swells.

“Lower the sheet,” he ordered. “Abaixe a folha,” came out of the speaker on his throat.

He felt an incoming message from Command. Not a good time. They didn’t force it, so he ignored it.

“Lower the sheet,” he ordered with more force. “Abaixe a folha!” came out of the speaker on his throat with more volume and bite.





The white bed sheet dipped. Another kind of flower, Echo thought. One of those kinds that opened in the moonlight. It revealed a young woman and two very young children, clinging so close he couldn't tell where one ended and another began.

He backed out of the room.

"Control, Team 9 Echo," he said softly. "I'll take that message now."

"9 Echo, Control." The voice of Command. "Value up to 62 percent. Thought you'd want to know."

"Roger," Echo returned.

"Hugs and kisses," Charlie added.

They moved quickly to the far stairwell. The change in numbers wasn't enough to change their plans. Command had an artificial intelligence. The Monster. With it, they had selected 32 targets in the city, each with close to an equal chance of containing high-ranking Caliphate officials. Intel monitored human activity: bandwidth usage, water usage, food and supply deliveries, the number of times young men came and went compared to the intra-city migrations. And anything else they could glean. They pumped all the data into a model and extracted the targets.

As Echo understood things, Intel kept the model live and open. Data streamed out of him, and Charlie, and the other assets, back into the model, reassessing the targets as the engagement unfolded. Command's message meant the odds that Charlie and Echo were in a high-quality location were rising. The probability had reached 62 percent. He could take from that whatever he wanted.

They surprised four more armed men in the stairwell. Blue bursts spread out from their Tridents. Narrow triangles, quiet until the fat ends sliced into their assailants, crackling through cotton, skin, muscle and bone, scorching the walls behind them. Burnt, black, bubbled flesh. Three of the men were cut clear in half. The other dove out of the way. Not faster than a laser, though. Nothing was. Echo's Trident dragged across him. He'd been told a good shot would sever the spinal cord in a 100th of one second, greatly reducing the pain.

Pain for the enemies, anyway. He wasn't so sure about the net effect. Physical pain was not the only kind.



No, it was like pruning a bush, right?

They cleared the fourth floor, then the third. Women and children, bleary-eyed, startled, pollenated with fear.

Not enough men of fighting age, Echo knew. He didn't bother saying it out loud to Command or Charlie. They knew too. The Monster counted everything. When studying the 3D-construct of the building, they'd written off the first floor. Too open, too many windows, too transparent to be of any use to the Caliphate. After searching floors five through three, they were left with floor number two.

\* \* \*

"Tridents and armor," the General said, arms behind her back, stars and stripes on the wall behind her. "That is the future of the American fighting force. I know what you're thinking. That sounds like ancient history. Like gladiators. Truth is, those tools let us go back even further. Before swords, before spears, before rocks and clubs. We are going to infect this city like germs. We are going to hit it everywhere at once. Outside and in. We are going to overcome it, like a sickness overwhelms the body. Then we are going to spread. Humans have never defeated the common cold. We are going to take a lesson from that. No collection of humans is going to defeat us."

\* \* \*

Command sent Echo an urge to pause. He stood before the door to the second floor. Charlie pressed a hand to his back. Without looking, he knew she'd turned. They stood back to back.

"Con, 9 Echo," he said with minimal volume.

"9 Echo, Con," he heard Control through the gear.

"Numbers?"

"You've got a 92-percent probability of high level targets in that room."



“Command and Control?”

“The Monster says hold and monitor, we want to send in a full squad.”

The big computer thought Team 9 hit the big time. Maybe the Caliphate’s central control. The commanders. And maybe those commanders were evacuating right now, rushing out some rat tunnel into the night. Escaping. He, and Charlie, should hold back. They had done their jobs. Mostly, he thought.

“Delta, Bravo, this is Echo. Report status, over.”

“Delta’s green.”

“Bravo’s green,” Bravo added from his position on the roof. “The keg’s secure.”

“Charlie,” Echo said. “I need to peek.”

“Didn’t come here just to leave.” She pushed her back against his.

Echo fried the door bolt and kicked.

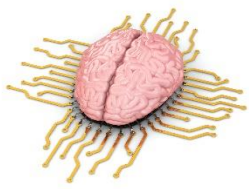
The room laid out long and wide. Not separated into apartments like the other floors. It had desks and chairs, couches and pillows, nothing matching or in any quickly identifiable kind of order. The windows were covered with rugs or paper. It had more video monitors than Echo could count before the bullets flew.

Two guards facing the door. Automatic weapons. Echo and Charlie darted to either side of the door. A hammer blow to his left shoulder. It spun him, but that was all. He checked the readouts in the faceshield. No troubles, except for the bullets flooding the open space.

He didn’t know if Command got what it needed from his brief look. They weren’t going to tell him, either. They wouldn’t break his concentration in a firefight.

One magazine emptied. The other continued. The guards staggered their fire. Good training. This would not be easy. Charlie crouched down and pivoted into the doorway. Echo stayed upright. Charlie took the left, Echo the right. No discussion, no fully conscious thought. They just did it. Blue pulses. Six-inch slashes in the guard’s chests, through the heart-muscles, through the spines and spinal cords, into the screams and stumbling and chaos behind them.

Echo stood for a full second, letting Command read the images coming through his faceshield, and listen to the cacophony caught in the microphones he wore. The mess. Men, in various states of dress, stretching, gaping, grabbing, leaping, yelling, stuffing themselves into a



wriggling mass of shoves and noise. Several had turned to face Echo and Charlie, pistols and assault rifles out. Like body guards.

“Control?” Echo kind of yelled.

“Jackpot,” the voice of Control returned. “Backup is six minutes out.”

Six minutes, Echo repeated in his head. He used to do six-minute miles back when he cared about timing his runs. He didn’t think these guys could make it a mile, but they could disappear. Dissolve into the city. They could reform and fight another day.

Command sent the urge to pull back.

“Charlie?”

“I’m in.”

Bullets from the other end of room arrived. Charlie slammed backwards into the wall. Echo felt a punch in the center of his stomach. Another off his faceshield. He hated those. They jerked your head. Broke your focus, if only for a moment.

The room lit up again. Twin blue bolts of very mean, very determined lighting. They didn’t zig and zag across a night sky. They went straighter than anything humans have ever made. And they cut.

\* \* \*

“You can speak freely,” the General said. “Tell me what you think.”

They had their team debriefing. Echo had not been prepared to sit alone with her for an informal chat, but if he couldn’t handle surprises he wouldn’t be sitting here in the first place.

“I don’t have an issue, ma’am.” Echo said.

“The Monster wanted you to wait. Control sent you an urge to hold and monitor.”

“We chose to disregard,” Echo continued. “I think it was the right call. We took five high-ranking Caliphate officials off the battlefield and destroyed their current command structure.”



“Yes,” the General said. “That was a major success. The Caliphate was not the Monster’s only concern, though. The machine takes a lot into account. What’s the enemy doing and what are we doing? How are we holding up?”

“I believe our vitals were reporting normal, ma’am.”

“There’s more to it,” the General said. “Our algorithms watch you, the person. As you swept the target, you and your partner engaged seven fighters. Then you entered a room with 17 armed men. I’ll be blunt. That is a lot of close-quartered killing. Soldier, Monster was a little worried about you.”

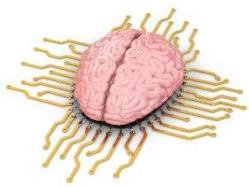
Echo let that sink in. This was the third time the General had surprised him. He never cared much for surprises. Even as a kid. He cared for other things.

“I used to help my mother in her garden,” Echo said. “Though she didn’t call it her garden. She always said the garden. She said none of us really owned land so much as looked over it for a spell. She never used pesticides because of that. Sprays were careless but we were careful. We weeded that garden by hand, every weekend. In that room, General. It was like that.”

General Guin’s head nodded ever so slightly. Echo was put in the mind of a bluebell in a soft breeze.

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Michael has been writing for longer than he’d like to admit. His last novel - The Milkman (EDGE Science Fiction and Fantasy), a murder mystery set in a world with no governments – won a gold medal from the Independent Publisher Book Awards and was a finalist in the Eric Hoffer awards. A sequel, The Link Boy, debuts in May. His previous novel, Cinco de Mayo, was a finalist for an Alberta Reader’s Choice Award. He has written for DC Comics, several magazines (fiction and non-fiction) the Urban Green Man anthology and two urban fantasy novels for young readers. Michael has a degree in English and Economics, but has worked in advertising for several years. He lives with his wife and two children on Grand Island, NY.



Cultural Support Team  
By Mike Barretta

"Your soldiers call you Ellen. Is there a story there?" asked Captain Carter Carroway, U.S. Army Medical Corp.

Captain Dianne Ripley leaned back in her Aeron office chair. The chair, pilfered from some Flag Officer's staff, had no business at the prefab outpost. The Doc was older than her. If he was career military, he would be a Major or Lieutenant Colonel. She concluded he was a reservist doing his time or a war tourist, looking for adventure. She leaned forward and her scatterlight camo shifted in slow waves. Her arms rested on the plastic table that served as her desk. "It's my last name."

"I still don't get it," said Carter.

"Have you seen the movie Alien? Aliens? And not the remakes, which sucked, but the originals. Ellen Ripley."

"No, I've never seen either," said Carter.

"Too bad," said Ripley. She leaned back and smiled and shuffled papers from one side of the battle-scarred desk to another. "I'm glad you're here. We've been trying to get you out here for about 6 months."

"Well, I'm here, and mission aside, I need to give you a field physical. You've been avoiding."

"I'm good. I don't have time."

"I've been directed and I don't have to take your word. Listen, no stirrups or anything. Why don't you just humor the Army's only combat gynecologist? I'm just going to interrogate your medical recorder, take a drop of blood, look in your eyes and we'll talk a bit. You can tell me about tomorrow's mission."

Against her nature, she acquiesced. "What do you need?"

"Put your finger here." He held out a medical analyzer. "You will feel a little prick and it's over."

She laughed.

"Something funny."

"You just described my sex life."

Carter blushed.

"Don't be embarrassed Doc. I'm just messing with you."

She pressed her index finger on the analyzer. The machine beeped.

"You can remove your finger." The analyzer whirled and he consulted it, squinting his eyes, processing the datastream.

"You're doing good. Liver function is nominal, Sugar normal. Oxygenation is good. No toxins. Nanotech load and amenerol levels are fine. Is the amenerol still working for you? Its effectiveness diminishes over time."

"Not a drop in about a year. I don't have time to bleed."

"You don't have..."

"It's from another movie. Never mind."





"Yeah, so it's working, but you've been on it for a long time. The jury is still out on long term effects. You can order tampons through the supply system and give your body a bit of a break. Women menstruate for a reason."

"Have you ever used a tampon built by the lowest bidder?"

"I understand they are useful for plugging bullet holes. There is the possibility the amenerol could compromise your fertility when you do decide to have children."

"That's not going to be a problem for me," said Ripley.

"At least you would have the option of changing your mind."

"I don't plan on having any kids, but if I were to, I have eggs on file in the Army repository. Standard hedge against teratogenic weapons."

"You don't see much of that around here," said Carter.

"The first law of weapons is that they proliferate."

"Right then. What is your preferred method of birth control?"

"Abstinence," said Ripley.

"Really, out here?"

"The Army's policy permits...."

"I'm familiar with policy. Let me interrupt you before you get on my bad side. There is not much to work with on this outpost. Abstinence is the safest policy for all concerned. And I am just flat out not interested."

"Side effect of the amenerol."

"Thank God for that. It's obvious that you have never experienced a CST (I) outpost."

"I know about CST teams. Eye?"

"No, 'I' for independent. We are on the @#\$ end of nowhere. This valley is like a retirement home for the survivors of the terror wars. We have Al-Qaeda, Taliban, ISIS, Wahhabi Jihadists, Tayyibba and even a few Al-Shabaab. This valley crawls. They snipe at us. We snipe back, but mostly we leave each other alone. I keep an eye on them and provide essential services such as yourself. They don't allow themselves to feel threatened because we are women. There is not a lot of activity, but there is activity. They tolerate us because I tread lightly and don't screw with them."

"Winning over their hearts and minds?"

"No @#\$% and @#\$. Petty Officer First Class Tiegs, is our Independent Duty Navy Corpsman, she is also a surgical nurse at a women's hospital in her real life. She has done good work with pediatric and gynecological care. She has connections back home so we get expired supplies without having to beg the U.S. taxpayer. She has saved a few lives. If it wasn't for her, the locals probably would have overrun this outpost a long time ago."

"I think I get it."

"I don't think you do, but that's not your fault. We have problems beyond Tiegs' skill level so we need you, the Army's only combat gynecologist. We have coordinated with three villages and have gotten permission from husbands, elders, and mullahs for you to treat three obstetric fistulas and a case of breast cancer."

"We've pre-staged everything you need and you have one day to work. I can't stretch the Army's or the local's patience."

"You have a mobile surgery?"



"It's standard equipment for a CST(I) team."

"I could have done this remotely."

"It is an older model. The AI is corrupt and there is no negotiating with it. The telepresence software is obsolete. It won't connect to MedNet, so it can only use its organic expert routines."

"No improvisation," said Carter.

"Exactly. The Army considers it expended, so we will deploy it on-site and abandon it in place."

"What for?" asked Carter.

"That's how I sold this operation. We are leaving it to collect genetic intelligence. The locals won't trust it at first, but it will be the only medical facility for 200 clicks. They'll use it."

"It beats dying of sepsis or gangrene," said Carter. "I need some post-surgical time with the patients."

"You are not getting it. They don't want us here and they certainly don't want us touching their women, but, like most men, they are willing to make concessions where @#\$% is concerned. I'm not worried about the ones that have given us permission. I am worried about the other ones. The ones that would rather see their women and children die than accept charity from us. How long will it take? I want to minimize our exposure."

"Fistulas are usually an easy repair, but they can get complicated and then there is the possibility of infection in a field environment."

Gun shots rang out and he flinched.

"Just a gun check." She jerked a warped desk drawer open, took out a box, and opened it up on the desk. A dozen glass cylinders filled with silver nanochines rested in foam inserts. The medical nano-scale machines, reacting to light, swirled like a quicksilver.

"You know what these are. Use them as you see fit."

"Silver bullets. Where did you get those?"

"Don't worry about it."

"I can't give nanotech to enemy combatants."

"Of course you can't, because you don't have any." She slid them across the desk.

"They're not combatants. They are civilians."

"I don't have the equipment to program them."

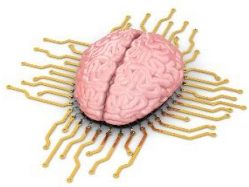
"Programmer is in the surgery. Have you repaired fistulas before?"

They are pretty rare in the developed world, but I've been a few places, Venezuela, Yemen, so yeah, I've seen them before and fistula repair is on the continuing education list for certification, so I've done complicated surgeries in the virtual a few times. Don't worry captain, I can do this."

"Good. It's life changing for these women, Doc. Remember that. I also need you to remember that the only thing simple about this operation are the operations. It took me six months to get you out here through the chain of command and another six months of working with villages to get permission for you to lay hands on their sick wives so they don't leak piss and @#\$% everywhere," said Ripley.

"Sounds like it's a bit personal for you."

"It is. I'm not going home until these women are fixed."



"Is that why you keep extending?" asked Carter.

"That's it. If I can excise just a tiny bit of misery from this world I will consider myself a success. You've seen women with fistulas, but you've never seen a woman living with a fistula. I can't go home until this is done."

He consulted his machine and pursed his lips.

"We will get you home then. Your blood pressure is up. Stress hormones peaking," said Carter.

"No @\$%, casual conversation pisses me off," said Ripley

"I'll be quick then. Lean forward. Let me look in your eyes."

She leaned forward and he shined a flashlight into her eyes.

"Headaches?"

"Everyday."

"Not unusual. "Silver flecks in your iris. Nothing to worry about. Side effect of your performance enhancing drugs."

"I monitor myself. I'm on profile."

"I can see that, but like the amenerol, you've been on them for a long time. You won't have to worry about osteoporosis. Your bone density is 90<sup>th</sup> percentile. I bet you have physical strength and endurance to match."

"It's useful out here."

"You didn't need it to complete Ranger training."

"You are not allowed to use Pee-Ees for Ranger training lest they camouflage mental weakness with physical strength. I'm not as young as I used to be and women fall off the curve a lot faster," said Ripley.

"Twenty-seven is not exactly over the hill."

"For a female Ranger it is," said Ripley.

"You're not competing with anyone out here. You can ease off a bit. As your Doctor, I recommend it."

"You're not my Doctor, and there is no second place in the field. When the Army said, Independent Operations, they meant it. We are thirty minutes away from drone support and that's if they deliver them ballistically. We can all be dead in thirty minutes, if the locals tried hard enough, but they cut me some slack because I am a woman. They don't take me seriously and I leverage their misogyny."

"How did you get the men to agree to treating their wives?"

"I promised them they could get back to @\$%ing."

"I see."

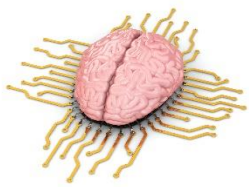
"You really don't. "Doc, It's going to be a long day for you. I recommend you turn in early. We will be moving out before the sun rises. I'll send a wakeup. Two prefabs down is the guest quarters. If you hear an alarm, take cover in the nearest fighting hole. Tomorrow, if you need any stims, I have you covered."

"I'm good."

"Tomorrow then."

"Yes, ma'am."

Carter stood and Ripley woke her laptop.



"Doc, thanks for coming"

#

"Cold," said Carter. He stamped his feet on the spray foam floor of the prefab.

"Hell, yea it is," said Connor. "It will warm up later in the day."

Captain Ripley walked in and her team made to stand.

"Seats. Good morning, listen up," said Ripley. They sat back down in a hodgepodge of chairs stolen from better funded commands. "Myself, Doc, and Vazquez will take the lead Bulldog." The Bulldogs were the Army's light tactical vehicles, a bit larger than the old Humvees and capable of autonomous patrols. "Vazquez, Connor, and Tiegs will ride the second. Comms between the Bulldogs will be line-of-site datalink. UHF backup. Threat is estimated to be low. But we will keep ourselves buttoned up. Vazquez keep your Sparrows up and about."

"Yes, ma'am."

"When we reach the village, I will liaison with the elders. Tiegs and the Doc will set up the surgery. Vazquez, Connor, and Shaw will provide security. Position the Bulldogs for a rapid retreat. The Bulldog's guns will be set to auto track, manual engage. Let me be clear, manual engage, unless we get into a fight, then switch to auto-auto. With that in mind, opcheck your personal transponders. Recognition software should discriminate, but the guns don't have an apology setting, so don't bet your life on it. Shaw make sure to update the database to include the Doc's profile we don't want to shoot the only reason we have to go outside the perimeter today," said Ripley.

"Yes, ma'am."

"Is she serious?" asked Carter.

"As a heart attack," said Shaw.

When she wasn't carrying a rifle, Shaw administered the outpost's machine systems and fabricator-printer.

"Doc, how long before you can bring in your first patient?" asked Ripley.

"About thirty minutes after setup."

"How long before you are finished?"

"With the anticipated caseload, it is going to take all day."

"I want to get back before sunset."

"It's surgery, I can't make any promises."

"Do your best," said Ripley. "Bring up the overhead."

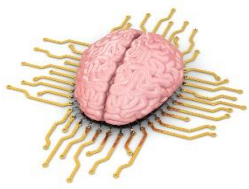
Satellite imagery appeared and drilled down to the village.

Ripley pointed. "We will set up the surgery here. The adjacent structure is for triage and recovery. It ain't optimal, but it is the best I can do. We've spray coated the walls, floor, and ceiling to keep it clean. After the small talk and @#\$ kissing with the elders is done, we will epoxy AC, skywater, and fuel cell units inside. I just hope the elders let the women recover before one of them moves in.

"Next," said Ripley.

A picture of a woman appeared. She looked worn and tired. One of her front teeth was missing.

"This is Fatimah. She is an English speaker, American, if you can believe that. She was lured by ISIS about two decades ago and stayed. She has been through about four husbands.



They keep getting killed. She is very bright and we have given her as much medical training as we can. She will be your post-surgical care nurse. Treat her like a local," said Ripley.

"Nurse?" asked Carter.

"Yes, we gave her some basic first aid training and paid her husband to let her be a nurse. I promised him the second half of the payment if he actually follows through."

"Hey Doc, what the hell is a fistula?" asked Vasquez.

"It's a basically a hole."

"What? @#\$%, No big deal. I like me some holes, ain't it right, Tiegs," said Connor.

"Bite me," said Tiegs.

"A fistula is hole between hollow organs such as the vagina, intestines, or urinary tract," said Carter. "Probably brought about by hard labor."

"I should be full of holes then," said Vasquez.

"Alright, knock it off," said Ripley. "Taking care of these women is a big deal. You know what happens to them out here. We will help, but this operation isn't worth any of our lives. Stay situationally aware. Vasquez, opcheck Mac and Cheese, and put a couple rounds through their guns. Bulldog turrets too. Shaw, print out armor and a sidearm for the Doc."

"You want me to get him some bullets?" asked Connor.

"That would be nice," said Ripley. "Ok, get to it."

The team split up going about their assigned tasks. Ripley and Carter stayed behind.

"Coffee?" asked Ripley.

"Yeah, black," said Carter.

"That's the only way we have it around here." She made two from coffee maker resting on the plywood table and handed him one.

"After this, you get to go home right?" asked Carter.

"Yeah, I go home."

"Good."

#

They drove slowly along the mountain road. The sun rose casting slanting rays across the dry landscape. Ripley drove the lead Bulldog. Vasquez sat next to her, monitoring the imagery beamed from the Sparrows. Carter sat in the back. The stink of his freshly printed armor filled the cabin.

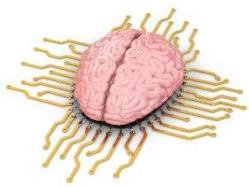
"Can we crank on the AC," said Carter.

"No, that would mean taking off the armored doors," said Ripley. The women laughed. "Open your vent."

"I've got signature," said Vasquez. "Doesn't look like they have any intent. They are opening our position." The biomimetic surveillance UAVs, the Sparrows, looked and flew like birds. The machines soared above the terrain in advance of the convoy using multi-spectral sensors to detect threats and relay imagery back to the Bulldogs. The Bulldogs in turn beamed the sensor data up to a high- endurance Global Hawk UAV for even wider distribution. Right now, someone in Bahrain was filling in the blanks for this particular valley. "Probably goat herders and look outs."

"How the hell do they live up here?" asked Carter. The vegetation was sparse.

"With an immense amount of difficulty. These people live hard," said Ripley.



"And die hard," added Tiegs over the Bulldog datalink. Her voice sounded like she was sitting in the same vehicle.

"Yeah, they do. Graveyard of empires. Brits tried it. Russians...and now us...twice" said Ripley. "Like, we didn't figure it out the first time."

"Excuse me ma'am, I'm going to have to ask you to exit the vehicle." said Tiegs. "It looks like you have had a bit too much to think."

"More than my fair share," said Ripley. "Two clicks out, Vazquez you got anything?"

"Negative, normal activity."

Carter leaned forward to look over Vazquez's shoulder to see her monitor display of the village.

"Doesn't look like much," said Carter.

"It isn't. Goats and guns outnumber the people," said Ripley. "Vasquez, bring your Sparrows down and give'em a couple of passes."

The view zoomed as the Sparrows dove down and crossed the village, a few heads turned skyward. One, a grizzled old man with a long beard, waved.

"Okay, Vasquez, we got permission, put'em in a security orbit."

"They know we are here?"

"How can you tell?"

"They're waving."

"Oh yeah, makes sense," said Carter.

"Doc, don't underestimate these people. It looks like a @#\$%!@ little mud and stone village but they ain't stupid. These people have been collecting guns foreigners have been dropping for over a century. They have everything from Enfield's to XM micro-munitions," said Ripley.

The image swirled. The Sparrows flew in a wide orbit around the village. The data fused into a slow spinning panoramic.

"This is the solar mirror and battery building. It powers a well, the mosque, and the elder's home. See that thing hanging from the line? Do you know what that is?" asked Vasquez.

"No," said Carter.

"It's a Chinese Stingbat drone being inductively charged," said Vasquez.

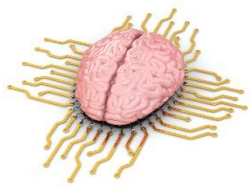
"How would they get that?"

"Some Chinese dropped it while they were running away," said Vasquez. "If that gear ever leaves its wire my Sparrows would tear that piece of crap up. Get inside its turn and claw out its circuits. Stingbats are @#\$%."

They drove past a man and his son walking slowly down the road. Each had an AK-47 slung over their shoulders. The son's gun looked ancient, like it was acquired during the Soviet invasion. Servos whined as the Bulldog's turret auto-tracked the two. Recognition software outlined the AKs in red.

"You are going to be busy with the surgery, but just to be sure," said Ripley. "Stay away from the mosque. Do not engage with anyone other than your patients. Your bedside manner is not welcome."





The Bulldog crested a ridge and the village came into view. The morning back light and distance made it look picturesque.

"Stay alert," said Ripley.

#

Carter triaged the women. All of them would need surgery.

He used a flashlight to augment the dusty sunlight filtering through the translucent plastic fixed over the windows. The frightened women smiled nervously and lay back on cots. Their eyes glazed over from the 10 milligrams of pre-op valium. Tieg held one woman's hand as she spoke and the local woman, Fatimah, translated. The breast cancer surgery would be the most complicated surgery as it involved substantial reconstruction. His handheld indicated that it hadn't metastasized beyond the breast tissue but the surgery's more powerful MRI would confirm. He would take her first and last. The first time he would reduce a knot of tumors with surgery, analyze it so it could be targeted by the programmable nanotech, and then take samples of healthy tissue. He needed at least four hours to grow a sufficient quantity for re-implantation.

"Tieg, are we ready?"

"Yes sir. The valium is hitting them hard. We should move the first two now. Fatimah will administer to the other two when you are ready. Family will receive the patients and bring them back here.

"Okay, let's get to it." He bent over to help the breast cancer patient get to her feet, and she recoiled.

"Let us do it, Doc. Nothing personal," said Tieg.

Fatimah and Tieg flanked the patient and walked her slowly. Before they left the white, spray-coated room, the woman covered her face.

He followed, passing Ripley and Shaw carrying in the equipment to install the fuel cell, AC, and skywater units.

"Are you good, Doc?" asked Ripley.

"I am."

"Ok."

#

After meeting with the men, Ripley posted herself with the women. Her helmet was off and her tangled blond hair cascaded down her back. Blond hair was a bit of an anomaly so it always drew attention. Back home, her hair was her vanity. With the women, she was fine. If she needed to go back to speak to any of the men, she would gather her hair up and tuck it under her helmet. The drawback of not wearing a helmet, besides a fatal headshot, was that without it, she didn't have her heads-up display to monitor the Leopards and Sparrows.

"Vasquez, how are Mac and Cheese?"

"New faces, so we are collecting intel. No obvious threat."

Mac and Cheese, the outpost names for two of the four General Atomics Anti-personnel robots assigned to their unit, were patterned after big cats. The machines were powerful and agile with polymorphic plastic muscles laminated over a carbon fiber skeleton. A distributed nervous system made them virtually immune to small arms. The machines had a war reserve mode that did not require a human in the kill chain. With a flick of the switch, the Army could



withdraw from the Geneva Convention protocols against autonomous killing machines. The men in this valley did not fear other men, but the Leopards were another story. She had learned that it was best to keep them outside of the villages when she entered.

She walked to the Bulldogs. She could see Vasquez through the thick bullet-resistant windshield monitoring the feeds. Connor leaned on one Bulldog and Shaw the other. Their M-4s were held muzzle down at the ready. They had never had trouble in this village before. The turrets had parked themselves in a ready position.

"Good?" asked Ripley.

"Good," replied Shaw.

"Have you guys eaten?"

"Yes ma'am, the local women brought us some chow."

"Great, make sure you take your anti-diarrheal."

Female family members gathered in front of the surgery, covered from head to toe. Children kicked a half deflated soccer ball to each other. Men sat removed and watched warily. Fatimah and Tiegs stretched out the first fistula patient and the women shrieked until Fatimah spoke to reassure them. Ripley pulled up next to Tiegs.

"Is it going well?" asked Ripley.

"Yes, the breast cancer patient is bit more complicated. We need to keep her in for reconstruction. But, fine. You have a lot of new faces out here. Everything Okay?" asked Tiegs.

"They are having a wedding," said Ripley.

"Is it going to be a problem?" asked Tiegs.

"No, it shouldn't be. How is our Doc doing?"

"He knows his job."

"Okay, good."

#

A boy ran to Ripley and tugged on her sleeve.

"Come, come," said the boy. Ripley followed crossing the village and being led through a gathering throng into a home. Women wailed and men gestured angrily.

A young girl lay bleeding on a mattress. An elder of the village, Aamir, spoke rapid-fire, agitated Pashto that boggled the translator. The bleeding child explained what the translator could not. Ripley opened her medkit and put a compression bandage on the wound. She gathered the child up, bullied herself through the crowd and ran.

Doc was exiting the surgery. "Doc!" he met her at the door.

"What happened?" asked Carter.

"Stab wound in the upper thigh. I think it nicked the femoral. I got a compression bandage on it."

Blood soaked her hands and the front of her uniform

"Where's Tiegs?" asked Ripley.

"Busy with Post-op. Let's go. You're with me."

Ripley followed Carter through the airlock into the sterile interior of the surgery.

"Put her down on the table."

Ripley lay the child out and Carter cut away her robes and bandage. The girl's eyes were glassy with shock. Blood pulsed weakly out of the wound.



"Oh, got the femoral. Keep pressure here while I get a line in." He positioned her hand just above the wound on the girl's inner thigh. He fastened a mask over her face. Oxygen hissed.

He took two attempts to set up an Intravenous line. "OK, got it." He attached a bag of clear synthetic blood. "Captain, trade spots. Squeeze the bag gently, just a bit of positive pressure. When it's empty attach another."

The girl moaned. He injected the wound site with a local anesthetic.

"Are you going to use the machine?" asked Ripley.

"In a second. I am still a bit faster than the machine." He opened the wound further with a scalpel, irrigated and suctioned. Her blood had a pinkish cast as it mingled with the clear synthetic. He clamped the artery. "Okay, we got some time here. I am going to set up the table to monitor vitals and let the expert do the rest."

He set up the bed to monitor vitals. A display lit up and the muted medical beeps of the girl's life filled the surgery. Line traces scrolled on a monitor.

"Watch your head," said Carter. A silver armed machine descended from an alcove in the ceiling and lowered itself over the injury. Theoretically, a wounded soldier could crawl in here lay down and the machine would fix them up. The machine set itself into motion. Delicate arms stitched and glued the artery back together.

"What happened?" asked Carter.

"A wedding."

"So."

"So, this is the bride. She stabbed herself."

"She can't be older than 13."

"Her name is Dari and she is twelve," said Ripley.

"Twelve? No, we can't let that happen. Who do we have to talk to?"

"Talk is done. That is why she is getting married."

The machine retracted into the ceiling and Carter inspected its work.

"You know what can happen to her," said Carter. "We can tell them she needs to go back with us for her leg. A man can...She could die."

"Remember who you are talking to. I know exactly what can happen. She knows too. Women here are disposable commodities to be exchanged and offerings to end disputes."

"I came here to help. I can't let this happen."

"You are not letting anything happen. This is not your problem."

Dari's eyes fluttered open and her face scrunched up to cry.

"Shhhh, It's okay sweetheart," lied Ripley. "You'll be fine." She looked up at Carter.

"Can she be moved?"

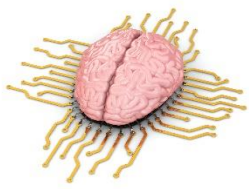
"Yes, but we should keep her."

"She is not a puppy. These are her people." Ripley picked the girl up.

"Captain..."

"Stay here, Doctor. I don't need a fight because you can't control your emotions."

Ripley exited the surgery. It was nearly dark. The women had retreated, clustered around the post-op room. A semicircle of men waited in front of the surgery. She counted three guns. The Bulldog turrets trained, smoothly adjusting to prioritized targets.



"We good, Vasquez?"

"We're ready if it comes to that."

Ripley walked towards the girl's father. The groom, a wire-thin, bearded man in his thirties, stood next to him. The father spoke and the broken translation filtered through her earpiece.

"Ripley! You can't," yelled Carter.

"@#\$\$," said Ripley to herself. She heard the spring tension of the steps as the Doctor stepped off the mobile surgery. She turned to face him. "Doc, I told you to stay inside." said Ripley.

"Ripley, maybe we could just....I don't know."

"Vasquez?" asked Ripley over Tacnet. Her heads-up showed the leopards in flanking position. The Sparrows tightened their orbits.

Carter walked towards her with his hand on his freshly printed sidearm

"Ready," said Vasquez. She had passed control of her machines to Connor and intercepted the doctor.

The Afghan men pulled the weapons tight, preparing to raise their muzzles.

"Vasquez, educate the Doctor."

"Vasquez, this is wrong," said Carter.

"On so many levels." She hit him in the pit of his stomach. Carter crumpled, air woofing from his lungs. He gasped for breath on hands and knees. Not that she needed it, but the armor she wore was fitted with the same polymorphic plastic muscles that drove the Leopards.

The local men laughed.

Ripley handed the frightened girl over and the wedding party retreated. Two men, one with an AK, the other with a sand-colored M-4, stood watch. She took two steps back and turned away. The spot between her shoulder blades itched. The sun was nearly gone. Dark mountains hemmed them in. The single light affixed to the mosque provided most of the illumination.

"Vasquez, round everyone up. I'll help the Doctor adjust to the real world."

Vasquez spoke into her radio to recall everyone.

"Carter," said Ripley. "You okay?"

Carter took deep gasping breaths.

"What a waste," said Carter. "How do you manage?"

"We manage."

She extended her hand and he reached up to take it. She pulled him to his feet.

"Are you going home now?" asked Carter.

"I think I will," said Ripley. "I've seen enough."

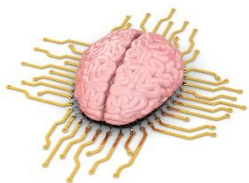
"Me too," said Carter.

Scratchy music blared as the wedding began.

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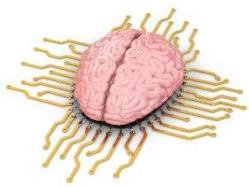
Mike Barretta is a retired U.S. Naval Aviator having deployed across the world flying the SH-60B Seahawk helicopter. He currently works for a defense contractor as a maintenance test pilot. He is married to Mary Jane



Science Fiction:  
Visioning the Future of Warfare 2030-2050  
U.S. Army TRADOC Mad Scientist Initiative



Player and they have five children. He holds a Master's degree in Strategic Planning and International Negotiation from the Naval Post-Graduate School, and a Master's in English from the University of West Florida. When the obligations of the day are over, he writes. His stories have appeared in Baen's Universe, Redstone, New Scientist, Orson Scott Card's Intergalactic Medicine Show and various anthologies such as War Stories: New Military Science Fiction, The Year's Best Military Scifi and Space Opera and the Young Explorer's Adventure Guide.



## The Defense of Gipper's Twist By Nathan W. Toronto

Jungle humidity is murder for Army-issued HUDs. Mine stopped working about 24.38 seconds after we touched down at Tocumen Airport, so I switched on my aftermarket specs and connected them by laser cable to the STAC—Systemic Tactical Awareness Controller. My old man gave me the specs as a graduation gift (West Point class of 2048). How he knew my Army-issued gear would stop working so quickly, I can't say.

I stowed my HUD and shrugged at Staff Sergeant Morris. "Figures. Aftermarket tech works better."

Morris grunted and motioned for the other human members of the HST (hybrid strike team) to debark. Morris had been distant the whole flight.

"Sergeant Morris," I said, pulling my ruck onto my shoulder. "I hope this doesn't feel like a babysitting assignment."

His eyes narrowed. "It's not that, Sir. We didn't even rate a C-17 from Bragg, and we didn't even get to jump from the plane. Panama's been quiet for twenty years, and we have ROEs so strict they wired them into the STAC." He flipped down his HUD and STACKed in, nodding towards the rear ramp in frustration. "Besides, a whole HST is overkill for a three-day area defense mission."

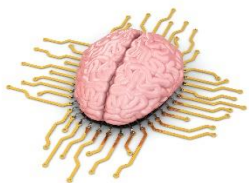
We were to secure the Ronald W. Reagan Omnidirectional Space Elevator Transition Station—Gipper's Twist, for short—the start point for one of four feeder cables to the main cable, anchored somewhere in the Caribbean. Gipper's Twist, connected to the Port of Gamboa by a 15K rail line, was the first link between a major seaport and Midway Station, a spaceport tethered in mid-earth orbit. Someday the elevator would extend to geostationary orbit, but for now we had to keep things calm on the ground so SECDEF could cut the ribbon at Gipper's Twist, in three days.

Back at Bragg, my CO had grinned. "What a great assignment for you, LT! We'll show the Ruskis and the Chinese that our elevator is better than theirs."

With a slap on the back he told me how hooah I was and stuffed my team and me, along with our gear, into the cabin of a rickety C-130. The carbon fiber skin and EM (electromagnetic) drive turbofan engines were a new lease on life for the old airframe, but after nine decades in production even Hercules starts to wear down.

I stepped from the ramp and wiped my brow as Morris strode toward the three Panamanian vehicles idling on the tarmac. He looked back at me and made a face. "And we have to ride in rusty old MRAPs."



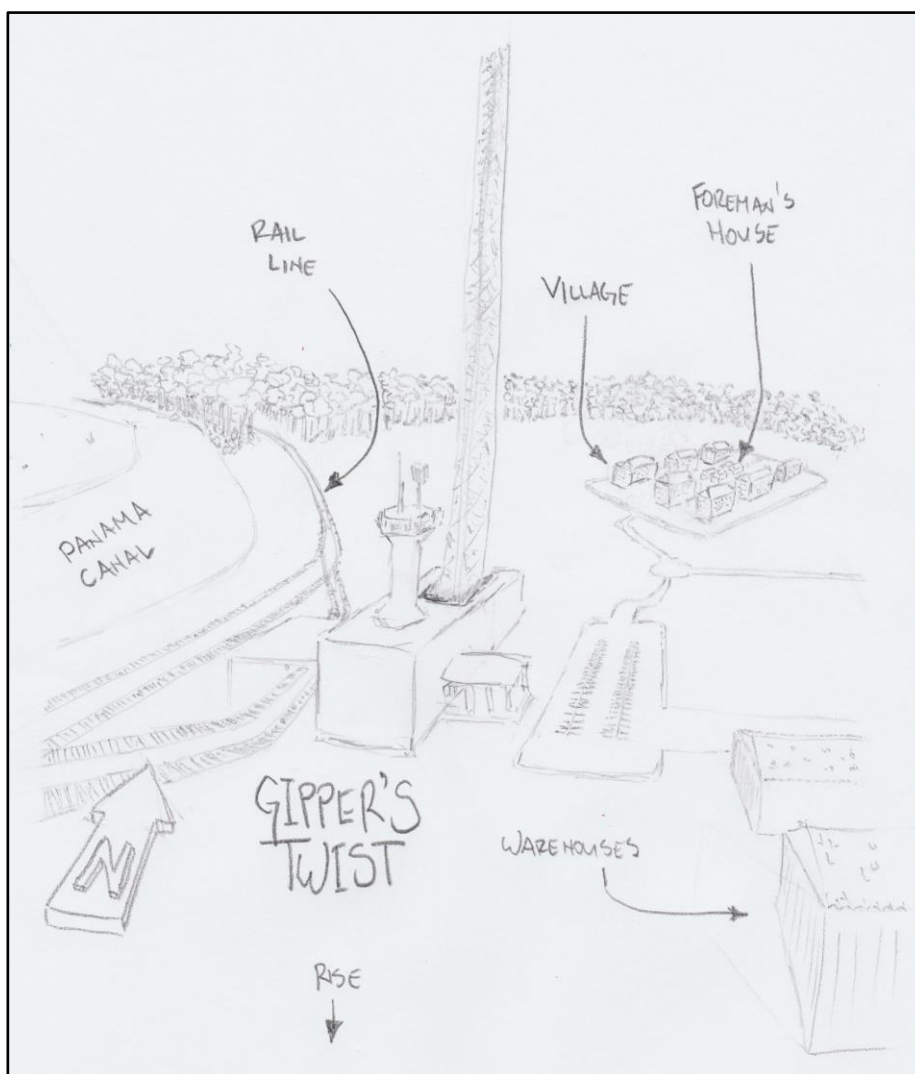


I ignored him and blinked into my specs to check progress. Drones were already in, and they were almost done with the rattle tubes (rapid-firing, self-propelled mortar tubes with STAC-targeting and turbo-cooling systems). The MECHs (Military Engineering and Combat Hybrids) would go last, since we'd use them when we got to Gipper's Twist to establish a wide area perimeter. No sense in defending Gipper's Twist by just sitting on it. I mean, who hasn't read *The Defense of Duffer's Drift*?

Morris commed over the STAC. "Ready, Sir."

I climbed into my MRAP, brimming with anticipation.

\* \* \*



The terrain around Gipper's Twist lent itself to the defense. The jungle had been cleared well away from the station to make room for the railway junction and other infrastructure, like



warehouses and the road to the village. As soon as defensive preparations were under way, I went to the top of the rise and sketched out the terrain. We had clean lines-of-sight and a lot of options for setting up interlocking fields of fire.

Our thirty MECHs helped set up the defensive strong points. MECHs performed combat engineering tasks, and their heat and IR signatures mimicked a human's. In a firefight, they could shoot, move, and communicate with their human controller over the STAC, so the enemy would have a hard time distinguishing them from human All Domain Soldiers.

The twelve ADSs in our team, including Sergeant Morris and me, covered all warfare domains. We had four ground combat controllers and two each of combat engineer, air domain, fires, and information domain controllers. Most of us could cross-operate in a pinch, and we could all fight the old-fashioned way. You know, duty, honor, country, and all that. The brass hated it, but we called ourselves "addies". "All Domain Soldiers" took too much breath.

With the MECHs, rattle tubes, and drones (fifteen unarmed for surveillance, comms, and targeting and five long-loiter ground attack drones), we had quite the firepower in our team. We also counted on continuous satellite and nextgen Global Hawk all spectrum surveillance and targeting, STACKed in seamlessly so we could see and shoot everywhere, even when it wasn't line-of-sight. In a real bind, satellite-based high velocity micromissiles, tipped with autotargeting explosive or inertial warheads, could rain death on the enemy. The ROEs were restrictive—no engagement outside the 1000 meter radius from Gipper's Twist, and no concentrated fires—but our team had warfare covered.

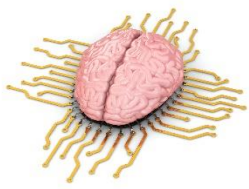
Confident, I put the CP in the Gipper's Twist control tower, kept an info addy, an air addy, and two MECHs with me, and assigned the rest of the combat power to strong points on the rise south of the CP, on the rail line leading into the jungle, and in the village, where I put our best marksaddies ("marksmen" is too gender-specific). I doffed my battle rattle and paid a courtesy call to the foreman of the work crew, who had a gentle demeanor and a Russian calendar that looked out of place on his wall. We exchanged pleasantries and he admired my specs, so I let him put them on. I put Morris in charge of organizing recon patrols, and instructed him to buzz my STAC if anything appeared amiss in the night. With a smile, I wiped the sweat from my brow, straightened my mosquito netting, and went to sleep in less time than it took my Army-issued HUD to malfunction.

\* \* \*

The buzz of bullets zipping through the CP startled me into consciousness. Brow furrowed, I reached for my helmet and weapon, then checked whether I was STACKed in. I blinked into my specs. Nothing.

"Sergeant Morris, do you copy?"

Nothing.



The two addies in the CP jumped out of their cots and activated the MECHs, then took defensive positions. I blinked into my specs again, but the battlefield overlay menu didn't activate. All I saw were grenade bursts and muzzle flashes in the night.

"Burns and Gill, whaddya got?"

"STAC's down, Sir," said Burns, the info addy, with powerful understatement.

Gill, the air addy, tapped his HUD. "Sir, we don't have STAC targeting or spectrum overlay, but we do have visibility for team air assets. We can..."

*Thwuck!* A bullet zinged through the window and hit Gill in the face. He slumped over, and instinct kicked in.

"MECH, cover my zone! Burns, help me."

Burns and I tried to staunch the blood, to revive him, but we failed. Bullets kept whizzing through the CP. Panic rose in my chest. Cut off from my team. I'd lost a man.

I stumbled over to my position, head spinning, the image of Gill's still body seared onto my mind. Yet another volley of bullets zipped through the CP, and my mind sprang to clarity. I rummaged through my ruck, hands crusty, and fished out my radio. I clenched my jaw and clipped the radio onto my shoulder harness, then returned fire.

I craned my head down to open the radio channel with my cheek. "Morris?"

"Sir, was your radio off? Lost STAC. Troops in contact at all strong points. Lost Jones and fifteen MECHs. Estimate enemy strength fifty fighters. Not clear how they jammed us."

I slammed my fist on the window sill. Two addies down. "What do you need, Sergeant?"

"Sir, rattle tubes are offline. Can you get us fires?"

"All the fires you want." *Screw the ROEs.* "You laze 'em. I'll blaze 'em."

When the enemy popped up, we smashed him, courtesy of my team's lasers and our ground attack drones. Problem was, the explosives twisted up the rail line and flattened one of the warehouses. The twisted metal and rubble were too much to clean up in two days. After the shooting stopped, I realized that the legal mess my concentrated fires created would take even longer than that to clean up. SECDEF couldn't come down like this.

My CO told me to hold a presser for local media to explain why the ribbon-cutting ceremony would be delayed.

Before the presser Burns came over to me, somber. "Sir, ran some STAC diagnostics. We had a hack. Your aftermarket specs."



I took off my specs and examined them with a wary eye. A dull metallic bead, about the size of a tick, was attached to the interior of the left temple. Then I remembered the foreman I showed them to, the one with the Russian calendar hanging on the wall.

I groaned, then considered the lessons learned:

- Controlling information systems won't ensure victory, but you're not going to win if you let the enemy hack you.
- When precision targeting breaks down, mass and firepower are still measured in effect, sometimes with strategic consequences.
- Battlefield terrain is composed of geography and information. And humans.

\* \* \*

I woke to the gentle hum of four EM drive turbofan engines. I didn't stop to think about whether yesterday was a dream, but applied the lessons, glad for a chance at redemption.

I tapped Sergeant Morris' shoulder and plugged into the C-130's comm system, signalling channel two.

"Sergeant Morris, STAC check, then test line-of-sight comms."

"Roger, Sir. I'll start Burns on a full STAC diagnostic," he said, reaching for his LOS comm card and holding it up for the team to see.

While the team rummaged for their own cards, I continued my instructions. "Launch drone patrols from the aircraft so we can have all spectrum recon as soon as we hit the ground, even beyond the ROE perimeter. We need a clear picture of the human and information terrain."

Morris nodded, then motioned for the team to STAC in. I flipped down my HUD to monitor the STAC check. When my HUD started wiggling, I passed it to Burns.

By the time I climbed into the ancient MRAP, I boasted a functional, Army-issued HUD, complete with active cyber diagnostics.

On route to Gipper's Twist, air recon gave us a baseline information and human terrain picture. The density of human activity around the station surprised me, mostly construction workers going back and forth, but the information picture blew me away. The village was thick with signals, centered on the foreman's house.

This time, I trudged over there with Burns, and I kept my gear on. Before rapping on the door, I nodded to Burns. He circled around the house to find the source of the flow.

The foreman answered, fat fingers holding the doorknob. "*Hola*, you must be security. *Bienvenidos.*"



His demeanor brimmed with levity, but I couldn't trust my mission to this man's geniality. All the same, I couldn't alienate him three days before the work was complete, so I yanked off my glove, flipped on my realtime digital interpreter and stuck out my hand. "Pleasure, Sir."

Entering his house for the second time, the same unremarkable interior met my eyes as before. I checked for clues that might explain the information flow. A decrepit plasma screen hung on the wall and a dusty cell phone made a home on the mantel, but there was nothing to suggest the place had left the twentieth century. I blinked into the STAC and messaged Burns: *Cut the line.*

The house buzzed with rapid-fire Spanish, too fast for my digital interpreter to pick up. The foreman's eyes darted this way and that. He shrugged in mock apology and shuffled out of the room.

A young woman emerged from the back, wiping wet hands on her bright pink apron, wearing a smile to match. "My father asks if you will please come back later."

I raised an eyebrow with as much nonchalance as I could muster and held up a hand. "No problem. Could you tell him that I'd like to gather the workers after the evening meal? I want to offer some words of encouragement."

"Si." She smiled and eyed the door with a please-leave-now look.

I pinged Morris as soon as my boot hit dirt. "You know the card security system for the construction workers?"

"Yes, Sir."

"Have handheld scanners ready to check worker IDs. I've invited them for a pep talk after chow tonight."

"Roger. I'll detail some MECHs for crowd control, and we'll check cards against the worker manifest."

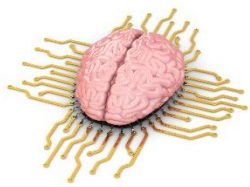
I smiled and blinked to ping Gill.

"Sir?" Gill said.

"Focus extra air assets on the village, and get the sat link up. I want to know if there are any suspicious comings and goings tonight, especially after we check IDs."

"Wilco, Sir."

With our strong points set, and with the all spectrum overlay streaming through my HUD, I felt confident that we had secured Gipper's Twist for the night. All the workers on the manifest came and had their cards checked after chow, and I blathered on about the future, pan-American brotherhood, and the riches the cable would bring. A couple of workers came up,



exchanged nervous glances and said something about “other workers”, but my interpreter didn’t follow the dialect. They walked off.

We were ready, though. At 2300, the patrols set, I laid down on my cot in the CP, giving strict instructions for Gill and Burns to wake me at the first sign of trouble.

I woke to a thunderous boom and the STAC alert buzzing in my ear. The CP shook. I bolted upright and reached for my weapon, half expecting to feel the tower topple underneath us. I slapped on my helmet and HUD, then worked my way out of the mosquito netting.

Burns and Gill were already up. I STACKed in and scrolled through the battlefield overlays. Explosion at Warehouse 1. Small arms fire north and east of the village.

“Burns and Gill, give me an air and info picture.”

“Sir,” said Gill, “targeting and recon for air assets are glitchy. We can find, but not fix and destroy.”

Gill: “Enemy is using handheld jammers with frequency skipping. Definitely Russian tech, Sir.”

Morris’ air controller STACKed through with a fire mission. The battle map on my HUD showed enemy fighters engaging from just outside the ROE perimeter. Occasionally they’d come inside, but not long enough for the rattle tubes to engage with precision, at least not without massing fires.

I scratched my chin. “Gill, patch into the sat and get some inertial micros on their way from low-earth orbit.” The jammers wouldn’t work as well on the slim-profile missiles, and they auto-targeted the last thousand feet of descent.

Another explosion went off by the rail line. The STAC’s alarm buzzed again, and I blinked it off to reveal a third squad-size element attacking us. I blinked through the overlays. We didn’t have any addy casualties, but total enemy strength was over fifty. The LEO sat only had forty missiles allocated to our team, and we were supposed to assume fifty percent targeting accuracy.

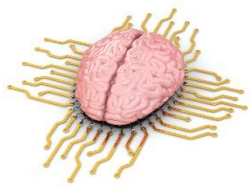
“Gill, how long before we have targeting back?”

“Sir, by triangulating drone, Global Hawk, and sat data, I can code a way around enemy jamming. Three minutes, Sir.”

“Roger,” I said. “When that’s up, use rattle tubes to funnel the enemy inside the ROE perimeter. Then we can target with small arms.”

“Wilco, Sir.”





I followed the engagement on my HUD. A group of fighters funnelled into the perimeter, but hugged the warehouse just before LEO missile impact, so only three of the fifteen went down. Other groups went to ground outside the perimeter, then disappeared from the STAC.

I pulled up the all spectrum imaging overlay, but the enemy fighters were gone. “Gill,” I said, “confirm contact lost with hostile force to the north.”

Pregnant pause. “Sir, confirmed.”

An eerie silence settled. Didn’t feel right. I pursed my lips. We knew where they were, and in what numbers, but had no idea what they intended.

I pinged Jones, a fires controller at the rail line strong point, and asked for a SITREP.

“Sir,” she said, “they shot our MECHs all up, but didn’t even target us. Had real good aim, Sir.”

Before I had time to process how our air and space surveillance capability could have lost track of two dozen enemy fighters, or how they targeted our MECHs, an explosion rang out from the direction of the warehouses, followed by the pucker of small arms fire.

“Morris,” I commed.

“On it, Sir.”

A message came over the STAC from one of the village MECHs: “Unarmed civilian running from station. Detain?”

I blinked an affirmative and said, “On route.”

By the time I got there the young woman from the foreman’s house lay tazed and shaking on the ground. A two-foot pipe lay nearby. I leaned down to check her pulse and turned to the MECH. “Was that really necessary?”

“She struck me with that pipe.” The MECH then produced a dusty old cell phone, just like the one I’d seen on the foreman’s mantel. I raised an eyebrow. “Summarize contents, MECH.”

Videos of workers wounded by rattle tube fire and members of my team aiming rifles at figures fleeing into the jungle appeared on my HUD, along with GIFs posted to social media. Hashtags like #AmericanImperialism and #UnsafeCable made the intent plain.

Her eyes flickered open. She sat up and gave me a surly glare. Off towards the warehouses, the engagement died off, and the pregnant silence returned. While the young woman fumed, another attack began back at the rail line. The sun had cleared the treeline, and the young woman’s knowing glance told me they had accomplished everything they set out to do, and I had not.



With a grimace, I turned on my heel and strode back to the CP, thinking of ways to explain to my CO how things had gotten so out of hand. Of course, he told me to hold a local presser. As I composed my opening statement, I considered the lessons learned:

- Space may be the ultimate high ground, but it holds little advantage without understanding the human terrain.
- Information is like water; you can influence its currents, but you can't control its content.
- Modern war is a race against time, a deadly game of hide-and-seek where no one knows who's "it". With precision targeting and microfirepower, whoever gets found first loses.
- A clear picture of the enemy disposition is no substitute for understanding his intent.

\* \* \*

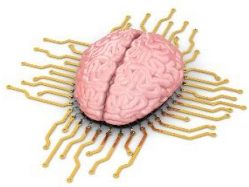
I awoke once again to the welcome sound of turbofan engines humming through the carbon-fiber fuselage of a well-aged C-130. I gave Sergeant Morris the same instructions as before, with the addition that Burns should insinuate zero-day malware on all networks in the vicinity of Gipper's Twist, just in case. I ordered Morris to create a quick reaction force, and Jones to lead patrols through the jungle, outside the ROE perimeter, to lay passive sensors.

When we got to the foreman's house, instead of cutting the network line and revealing our intent, I instead had Burns splice in, both to install his malware and to feed information back to the States, in case anyone in the village was part of known networks. I asked the foreman to demonstrate the station's capabilities for me, and I had Gill take high-resolution video of a shipping container ascending into the sky. The container was empty, and we brought it back down after a thousand feet, but the video that Gill produced would help steer the narrative about Gipper's Twist on social media. The video went viral, so I had Gill follow me around for the rest of the evening, inspecting construction progress, addressing the workers, and offering a substantial CERP bonus to the whole crew if they finished the project a day early.

The video fun stopped at night, though. "Sergeant Morris," I said over the STAC, "enforce a nighttime curfew. Have Burns set up a thorough permit investigation process should anyone decide they want to leave their homes anyway."

"Wilco, Sir."

I didn't even bother with a CP, much less a cot and mosquito netting. I would not fail this time. I caught some sleep here and there during battlefield circulation. Things were quiet until about 0200, when Gill's voice came over the STAC: "Sir, three groups of four individuals heading into the jungle. Passing drone feed to you now."



I examined the feed. *How'd they avoid the curfew patrols?* "Looks like they're converging on a point in the jungle," I said. "Jones, can you intercept?"

"Yes, Sir. We'll be waiting for them."

"Sergeant Morris," I said. "Have there been any curfew violations?"

"None, Sir. Their spectrum signatures appeared all of a sudden in the jungle, but they match signatures we logged in the village earlier. Not sure how they got there."

"Sir," said Gill, "all spectrum imaging indicates a possible weapons cache at Jones' rendezvous point."

"Jones," I said, "if they touch those weapons, detain them, but do not engage with lethal force."

"Wilco, Sir," said Jones. "In position now."

I watched the confrontation unfold on my HUD. The twelve villagers converged on the rendezvous point, and Jones' patrol enveloped them with practiced skill, silent. The villagers opened up the cache, and Jones and her patrol pounced.

"Sir," she said. "Eleven men and one woman detained. Gave up without a fight." She paused, but kept the channel open. "Uh, Sir, these aren't your average narco weapons. These are high-end AKs with signature diffusion and all spectrum sights. Chinese manufacture. They could pick off MECHs from well inside the jungle without having to worry about hitting a human."

A shiver ran through my spine. They were much better equipped than I thought they would be.

Morris commed. "Sir, a couple of MECHs and I located the spot where one set of signatures popped onto the STAC. Found a late-model handheld tunnel digger. Even has the original manufacturer plate in Cyrillic. They had plenty of time from curfew till now to tunnel into the jungle."

"Good work, Morris and Jones. Jones, bring those villagers and hold them in Warehouse 1. Burns, take two MECHs and begin processing and interrogation. Be ready to launch the zero day if things get hot." I smiled at the battlefield overlay on my HUD, completely devoid of enemy activity, but I wasn't about to get cocky. "Stay alert, Team. This isn't over."

I went to confront the foreman. "Before few days," he said, "men with guns come and threaten my daughter and me. We had to take in those twelve, like they were workers."

He refused to say anything more, so I detained him and his daughter, mostly for their own protection.



A new day dawned, and I let myself believe that we could succeed. The day passed without incident, even without the foreman directing things. Workers scrambled to put the finishing touches on Gipper's Twist: siding the station, seeding grass in the soil, painting parking lot lines, installing electrical fixtures. My team and I watched them carefully. It looked like Gipper's Twist would actually be done a day early, so I contacted Bragg to finalize my CERP request and offered local media a sneak peek of Gipper's Twist, one day before the ribbon-cutting. It would be real coup: award the crew their bonuses and show local media a container rising into the morning sky.

The next night passed without incident, and I afforded myself the luxury of a cot. I could almost see SECDEF's beaming face as she shook my hand with a firm attaboy. We just needed to pass one more tranquil night, then we would be home free.

I took off my battle rattle for the local media event. I unplugged my STAC and donned soft cover. More approachable and human that way. I stood in the parking lot with a clutch of local media. To the click of cameras and typing thumbs, and using my digital interpreter, I explained how Gipper's Twist would endure as a symbol of pan-American togetherness and prosperity. With a flourish, I motioned towards the shipping container as it entered Gipper's Twist on the rail line, explained how the twist mechanism lifted it from the rail line to the cable, and smiled as the container began rising from the station roof behind me.

But then the cable machinery stopped. I turned, and a pit opened in my stomach. Something snapped and the container fell back into the roof and crashed down inside the station. The concussion blew out the windows. A section of siding fell off the station. My blood went cold as I realized that the cameras and thumbs hadn't stopped.

I called off the demonstration, but the press walked off smiling with glee at America's humiliation. I dreaded the hashtags I'd see that afternoon.

I was already composing contrite words for my report when Burns ran up with my STAC earpiece and HUD. "Sir, Bragg finally got back with that human networks report you requested. Thirty names came up. We got twelve that first night, but eighteen others were in the work crew yesterday."

I took the earpiece from Burns and shoved the laser cable into my HUD. When the systems synched, I switched on my private channel with Sergeant Morris. "SITREP."

"Sir, Gipper's Twist has flexiglass. Even with that container falling in, those windows should've held. A combat engineer checked out the siding, and he thinks some of the workers put microdet behind it. The crashing container disguised the sound of the detonation, which was probably set off remotely."

Sabotage. For maximum media effect. We were so close. After sending my report, I reflected on the lessons learned:



- In an information vacuum every military action is tactical, but as long as communications hold out any action can become strategic. Unfortunately, information vacuums do not exist.
- Achieving information dominance is important, but it's just as important to retain and exploit that dominance.
- Technology enables economy of force and a clear picture of the human terrain, but controlling the human terrain requires material influence.
- Hubris is a fickle friend.

\* \* \*

I woke once again and sighed in relief at the forgiving turbofan hum of the C-130's engines. Determined to apply what I learned, I organized the team for maximum effect, as before: drone patrols, quick reaction force, strong points, jungle patrol, zero day malware. I even requested a human networks report on the worker manifest as soon as possible, marking it high priority so I'd get it back within twelve hours instead of two days.

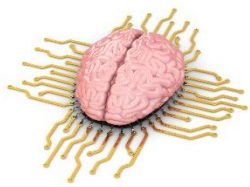
Instead of trying to control events as they occurred, I trusted my team to operate based on mission intent. Every addy had a responsibility, and I rotated around the battlefield to lend support, encourage decisiveness, and empower initiative. Together, Jones and Morris sussed out enemy movements on the first night. Based on the human networks report, Burns waylaid certain individuals with time consuming questions and paperwork. Gill detected messages to Russian contacts in Colombia asking for microdet and drones to activate it. I used the CERT bonuses, but I also gave references to authorities at the Port of Gamboa for any workers who wanted to move away from the influence of narcotraffickers.

And I didn't hold a local presser the day before SECDEF's ribbon-cutting ceremony. I documented progress at Gipper's Twist on social media, but I didn't accept more risk than was necessary.

The night before the ribbon-cutting, I stole a few hours' sleep, then woke at midnight to circulate. The day before had been cooler than normal, and fog descended in the wee hours. At 0335 muzzle flashes and grenade blasts ripped open the pre-dawn.

"STAC in, everyone. Trust your buddy and use your overlays."

Burns launched the zero day, in case any villagers had second thoughts about which was the right side to support. My HUD showed 112 fighters hunkered down outside the ROE perimeter, plunking sniper fire into my team's positions. We had a few MECHs damaged, but we dominated air, space, and information domains, and the enemy didn't target our addies. A real twenty-first century standoff.



Then Jones got hit. Lower extremity. Nothing really dangerous, but it was enough, so I got on the horn to Bragg and asked my CO to approve an expansion of the ROE perimeter.

“The longer this goes on, the worse it’ll be for us,” I argued.

“Approved,” said my CO, “but higher says to employ just enough firepower to get them to withdraw. Nothing more. Airborne.”

“All the way, Sir.”

Our LEO missiles and rattle tubes savaged the enemy as soon as the STAC expanded the ROE perimeter, and at 0407 the enemy started to withdraw. The STAC overlay showed them carrying off about 40 casualties, but we couldn’t say if they were dead or wounded.

I led a patrol into the jungle to see what I could find out about the enemy. They didn’t leave many clues, aside from some bloody foliage and shell casings, but we took samples anyway. On the way back to the village, I considered how decisive an advantage all-domain dominance is.

Before the ribbon-cutting ceremony the next day, as we waited for SECDEF, Burns leaned over to me. “Sir, the DNA analysis came back on that foliage. Mostly Latin genes, but some Russian as well.” He grinned and raised his eyebrows. “Spetsnaz?”

I turned up the corners of my mouth. “Don’t let it get to your head, Burns.”

SECDEF’s convoy pulled up outside Gipper’s Twist. She got out of her black SUV and strode up to me. “Attaboy, LT Forehand Hindsight,” she said, pumping my hand up and down. “You’ve made America proud.”

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Nathan Toronto loves stories, and has been known to stay up until three o’clock reading military history. His debut novel, *Rise of Ahrik*, tells of a love triangle in a matriarchal society thrust into a worldwide war. He’s lived in eight countries, visited 23 others, and speaks four languages.





## MOOSE MUSSTARD

By Karl Klicker

**Fort Bragg North Carolina  
Sunday May 4, 2042, 1015**

Staff Sergeant Annie Treadway, 18 Foxtrot, thought the final paragraph of her analysis through the pulse of her index finger into her PaperThin tablet, classified it, encrypted and saved it, then rolled up the tablet and stuffed it in the cargo pocket of her camouflage trousers.

Crossing the 3<sup>rd</sup> Special Forces Group compound, the 28-year-old, blonde, athletic NCO, combat veteran of the Fourth Iraq War, bounded up the stairs and into the CyberSof headquarters. A biometer in the foyer scanned her retina, blood pressure and breath and greeted her by name, “Good afternoon Staff Sergeant Treadway.”

“Hi-yo, Bio,” Treadway smirked.

“Destination?”

“I need to see the Command Sergeant Major.”

“You are cleared. I’ll let him know you’re coming,” the biometer offered. “Have a nice day.”

“You too,” Annie said, as she passed through the foyer, to the Sergeant Major’s office. The Command Sergeant Major, Johnny “PH” Carwash, stepped out of his office. “PH” was short for Purple Heart, and Carwash had more of those than anyone at Bragg – at least seven. Orphaned at 10, a long time ago, the now-square-jawed, black as night, leathery 50-year-old had survived on the streets washing people’s cars for digital coin. He changed his name to ‘Carwash’ when he turned 18, then joined the Army.

“Hey Treadway! What’s on your mind?” he asked in a gravelly bass.

“Hiya, PH.” Everyone called him ‘PH.’ “Just stuff, but it’s classified. Can we talk in your office?”

With the door closed, the Sergeant Major walked around to his wing-backed leather chair, and offered the soldier a seat in front of his desk. “So whatchya got, Staff Sergeant?”

“Well, Sergeant Major, you know those reports we get on the Veringians building artificial islands off the coast of Vaalbara? Some have air strips, and...”

“Sure,” he replied, but that’s way out of our Area of Responsibility. That’s a 1<sup>st</sup> Group thing, or 1<sup>st</sup> of the 10<sup>th</sup>. What puts this in your wheelhouse? MY wheelhouse?”

Treadway reached in her pocket to pull out the rolled-up tablet. “I know it’s in 1<sup>st</sup> Group’s AOR; I used to do reporting on Vaalbara when I served with 1<sup>st</sup> of the 10<sup>th</sup>. I still track it ‘cuz it’s interesting. Guess I’m a Veringian nerd.”



Carwash gave her a crooked smile. “Didn’t know that. So what is it?” the sergeant major asked, “And why didn’t you just go to the S-2?”

“The major and the rest of the 2-shop are on travel,” Treadway replied. “I’m just holding down the fort for the weekend. I’ve been working out some math estimates in my spare time. Geometry, actually. Here,” she said as she booted the PaperThin and called up an image. “Look at this.” Annie placed the tablet on the Sergeant Major’s desk and turned it so he could inspect the image.

“Check out the arrangement of these islands off the southeast coast. Aside from the fact that this complex is in what we consider international waters, and their claim to territorial integrity is disputed by every regional government, I believe the geometry is more dangerous than the location.”

The sergeant major looked up. “Geometry? OK, I see the pattern. What’s the point?”

Deadly serious, Staff Sergeant Treadway looked the Sergeant Major in the eye and replied, “If they continue this pattern, by late this year, maybe early 2043, they will have a 5-orthoplex. That means...”

Equally serious, the sergeant major said, “Uh, I think I slept through that class. What’s a ‘northoflex?’”

“Ortho Plex, Sergeant Major. Orthoplex. It’s a theoretical 5<sup>th</sup> Dimension construct that folks like Albert Einstein and others have been working on for the past 150 years. If the Veringians can construct a *tangible* multi-dimensional configuration, it could allow them to unlock the 6<sup>th</sup> through 10<sup>th</sup> dimensions.”

“Uh-huh. I see. Not. So you’re telling me this thing is a weapon?”

“Not by itself, no, but if they can master the 5<sup>th</sup> Dimension – create a penteract – it would change the face of war forever. Theoretically, with each dimension, they could bend time and location... space. Basically disappear in our timespace and reappear in another time, another place. Un-do a lost battle.” She flipped through the images on her tablet to show him an artist’s concept of a penteract.

“Damn! How the hell does a staff sergeant figure this stuff out?”

“I read a lot. Anyway, since we haven’t inspected these sites in person and don’t really have the tech to read super strings emissions, in person, as far as I know... I would postulate...”

“Don’t use words like ‘postulate’ with a crusty old sergeant major, Annie,” he smiled. “Kidding. Go on.”

“...they could be using the islands, both manmade and natural, as a cover for burrowing into the earth. To create a fully dimensional penteract, or 5-orthoplex, they would need to have nodes beneath the sea as well as overhead. Kinda 3-dimensional.”

“For overhead, you mean like with satellites?”



“No. I thought through that, Treadway answered. “Satellites would be too far from the site. But they could loiter helicopters in the right configuration, or use tethered aerostats. This would be a fairly compact system, globally speaking. Helicopters and aerostats would both be subject to prevailing winds, but.... I have that math here,” She said, reaching for a note-dot.

“Don’t need that. Got it. So what do you want me to do?” asked the Sergeant Major.

“Get me in to see the colonel? I need someone with more horsepower than I’ve got to get this to the right people. Someone in Washington’s gonna need to make some decisions on this.”

“Can do easy,” Carwash said. “Is anyone else working on this?”

Treadway replied, “I’ve got a buddy at OGA who dabbles in Scientific and Technical... S and T. Johnny Realeyes. We compare notes on Chatt.”

“You’re kidding. Realeyes?”

“Only guy in his unit who wouldn’t get the implants to see UV and infrared. Against his religion. Folks call him ‘Realeyes.’ He left 10<sup>th</sup> Group for a job with OGA.”

### **Langley Virginia, 1135, Same Day OGA Directorate of Operations**

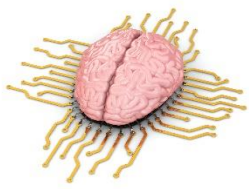
Nicholas “Max” Maxwell finished reading the classified message from a colonel Deke O’Brien, 3<sup>rd</sup> Special Forces Group. Also copied on the message were Special Operations Command, Assistant Chief of Staff of the Army, three people at Department of Defense and three counterparts at the Joint Chiefs of Staff, the Director of National Intelligence, and Walt Beyer at the White House’s National Security Staff. O’Brien had just been briefed by a Special Forces intelligence NCO at Fort Bragg. The message was classified TS Codeword // Eyes Only // Close Hold. The gist of Colonel O’Brien’s message was, “Do you have a ‘Johnny Realeyes’ in S&T?”

Max tapped the comms tattoo at his Adam’s Apple and spoke, “John Renfro.” Three seconds later, he heard: “Johnny here, Boss. What’s up?”

“Hey Johnny, need to chat with you. Special project. Can you come up to the 5<sup>th</sup> floor?”

### **The Pentagon, Monday May 5<sup>th</sup> 1330 Assistant Secretary of Defense for Special Operations and Low Intensity Conflict**

Career Senior Executive Nancy Rohrbach, A/SD-SOLIC, invited Navy SEAL Rear Admiral Mark Spence, Commander, Naval Special Warfare Command, and Air Force General Jenny Walters, Strategic Command into her office. “Thanks for making the no-notice trip, General, Admiral. Coffee?”



“Sure. Thanks,” they replied in unison. Rohrbach called to her assistant to fetch the coffee, cream and sugar.

“I don’t know if you’ve seen the traffic on this, but I’ve spent the morning on a secure line with the DNI, Walt Beyer – you know him, a tech geek at OGA, and believe it or not, a staff sergeant at 3<sup>rd</sup> Group, Fort Bragg, talking about the 5<sup>th</sup> Dimension.”

The two senior officers looked at each other... then back to Nancy Rohrbach. “Must be pretty close-hold, Ma’am,” said Admiral Spence.

“I’ll fill you in. My folks will get you the complete packet on this before you leave. Bottom line is, pending National Security Council recommendations and the President’s decision, we’re going to need a CONOP in place in a week, and a covert SEAL recon in the South Pacific. The Assistant Secretary of Defense briefed Spence and Walters on the theory, the projections and potential threat described by Staff Sergeant Treadway – amplified by this Johnny Realeyes fellow at OGA.

“So,” she continued. “Worst case, SEALs confirm the Veringians *are* tunneling. We send a scientific research ship – air quotes – in with some ground penetrating radar to determine the depth of the tunnels. They can get close enough. If the Veringians file a demarche, State will reiterate that we don’t recognize their territorial waters claim and it will drag out in the UN. Once we get the geometry on the tunnels and the islands and can project what they would need for aerostats or helicopters, we wait for the first sign of either. That gives us intent enough to launch a pre-emptive strike.”

General Walters looked to the SEAL, then Rohrbach. “Are we talking about ManDroids, or, you know, nuclear?”

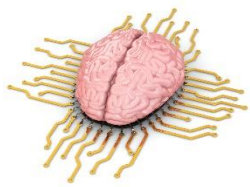
“No, of course not Jenny. ManDroids could.... And I don’t mean to belittle you, but this needs to be a plausible deniability mission. ManDroids are great, but we need human eyes on this – people who can answer questions, exercise judgment, and be prepared to go well beyond AI algorithms. If we go live, this will be a named mission. Operation PINK FLOYD.”

Jenny smiled. “Lasers?”

“Special lasers, General. That tech geek at OGA and his team have a new trick up their sleeves.”

**Joint Region Marianas**  
**Nimitz Hill, Guam**  
**Wednesday May 21<sup>st</sup> 0630**

The Sensitive Compartmented Information Facility briefing theater at Joint Region Marianas was packed with an array of one-star generals and admirals, policy makers, scientists, lawyers, and more military of all ranks, huddled around the continental breakfast of coffee,



juices and pastry. At precisely 0630, Marine Major General Robert “Knuckles” Bradshaw stepped into the SCIF, followed by Air Force Chief Master Sergeant Gerald Snow. Bradshaw’s booming voice welcomed the team: “Welcome to Joint Task Force Hyperion. Take your seats please.”

“Ladies and gentlemen, I’m Bob Bradshaw, Task Force Commander. I’m a MARSOC guy. Chief Snow here is my JTF Command Sergeant Major. I read 0630, 21 May. We have a lot of work to do over the coming week. This OP is classified TS Codeword. What we do on Guam stays on Guam. Go it?”

“Got it, Sir!” was the reply in unison.

“You should have all received OPERATION PINK FLOYD background packages. If not, see Chief Snow and catch up. Quickly.” Gesturing to a Navy Lieutenant, Knuckles Bradshaw continued, “Lieutenant Lawrence here is the SEAL unit commander. Based on the intel his team brings back, presumably by Friday, we will launch NOAA Ship Discoverer II for additional covert recon. They’re loitering 100 to 200 nautical miles off Vaalbara. They can do 20 knots and steam to the Vaalbara island chain in under 10 hours. Priority Intel Requirements are...”

A hand went up in the back of the briefing theater. “Sir?”

The General turned to the voice. “What’s on your mind, Andy?” Bradshaw asked. It was Andy Anderson, the modern day “Q” to the SOF world.

“We all have enormous confidence in the SEALs, but this mission seems ready made for MD-25s.”

Bradshaw paused before responding and looked around the room. “Look, Andy,” he said. “I know you’ve spent your life perfecting ManDroids, but I need decision-makers on site, not AI. The SEAL team will place charges to be remotely detonated – in case Pink Floyd fails. Ever try to spit in a spittoon 250 thousand miles away?” Bradshaw finished his in-brief and the team got down to work.

“Lieutenant Colonel Terry,” Bradshaw called out. “I need to see you.” Terry, a Psych PhD, was pretty much the dean emeritus of PSYOP at the JFK Warfare Center.

Terry shuffled through the body of planners. “What can I do for you, Sir?”

“I need you and your team to gather the right kind of science guys and build a disinformation piece – black PSYOP – for release on the net... It’s gotta read like a peer-reviewed, oceanographic research paper. We need something that will explain what caused calamity on those islands assuming Pink Floyd works as advertised, and an alternate story that explains why the islands disappeared into the ocean if we have to detonate the SEAL’s charges.”

“Roger, general,” Terry replied as he looked for his team.



Bradshaw strode over to speak with John Renfro, who was talking with his hands, explaining something to a female Air Force major. “Realeyes,” said Bradshaw, can you talk me through the proposed effects of Pink Floyd one more time, and this 5<sup>th</sup> Dimension stuff? I’m a street fighter, not a physicist,” then called out, “STRATCOM. JAG.”

Air Force Brigadier General Tony Portillo made his way through the briefing theater to participate in the discussion. Two JAG officers, a Marine Major and a Navy Commander, followed in trace to listen in. Realeyes explained the implications of mastering dimensional physics – in undergraduate terms. Portillo explained the laser option, “Basically what we’ve got, Sir, is a truck-sized device on the dark side of the moon. We call it ‘The Exacerbator.’ Got a problem? – we make it worse. If you don’t have a problem, we’ll make one. Flip the switch and it moves into position on command. It’s kind of a dial-a-laser, with gas lasers like all-gas-phase iodine, deuterium fluoride and chemical oxygen-iodine, or we can go metal vapor – with everything from gold vapor or copper vapor to helium-mercury or strontium. We’ve got solid-state options as well.”

Johnny Realeyes piped in: “What we’ve been experimenting with is using a combination of laser types, with picosecond pulses to excite changes at the molecular level in living organisms.”

“Humans?” Bradshaw asked.

Realeyes and Portillo looked at each other. “Not yet, Sir,” Portillo replied. “We’ve tested the apparatus on live animal subjects.”

“And?”

“What we get,” Realeyes explained, “Is something called ‘mass effect.’ Mass as in MOOSEMUSS. The laser pulses create biochemical changes in an organism that lead to rapid growth in tumors. These tumors will then restrict the functions of adjacent organs. For example, a brain tumor may be generated, leading to a sub-cranial hematoma, rapidly increasing intracranial pressure, and eventually deadly brain herniation. The same effect happens with tumors in other organs.”

“Damn! So it’s true... that’s sick,” the general said, turning to the lawyers. “Is this legal, from a Geneva Convention point of view?”

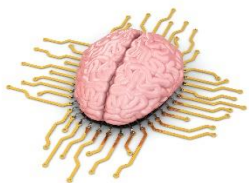
Commander Jose Ortiz replied, somberly, “Um... it’s not illegal, Sir. That’s all I can tell you.

“But it works?” the General asked. “And we can target specific humans from the lunar surface?”

“Of course, Sir.”

“Get back to work,” the general replied, pensively.





**Saturday May 24, 1630**

**SSN Fargo, 200 feet**

**Off the coast of Vaalbara**

Lieutenant Lawrence, Master Chief (SW) Kurt Teague, and two First Class Petty officers sat in the dry room, pulling off gear and stowing their kit while debriefing with the Boat's XO and Intel officer. Teague explained, "You know how the Emiratis built those artificial islands off Dubai forty years ago? This is that in spades. We scanned four of twelve islands. Each island has a prefabricated column... maybe 10 to 12 feet in diameter. Didn't get a read on what material."

Lawrence added, as the SSN Fargo intel officer took notes, "I'd estimate those columns run 200... maybe even 300 to 400 feet. We knocked, 'politely,' and got the impression they are not filled with either sea water or rock. Maybe resonance chambers?"

The frogmen completed their debrief as the Fargo made for Guam.

Three days later, observers on NOAA Ship Discoverer II sent an encrypted message to HQ Joint Region Marianas: "Aerostats aloft. Sixteen total. Tethered. Cables approximately 280 to 300 feet. Out."

**Fort Bragg**

**Thursday, June 5<sup>th</sup> 2042**

**Fort Bragg**

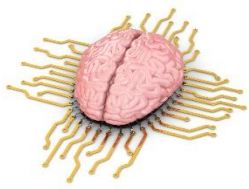
Staff Sergeant Annie Treadway scrolled through open-source news headlines, looking for a treat. After an article on Global Cooling from the National Science Foundation, she spotted this:

**Associated Press** - The Veringian Guard has just announced they are abandoning an island chain off the coast of Vaalbara. Unnamed sources report that hundreds of soldiers have been med-evac'ed by air and ship, with an unknown number of fatalities. Speculation continues on the relationship between this unexpected turn of events and a recent study published by oceanographers from two American universities, one Australian and a French university regarding the release of microbes from the Marianas Trench. These microbes have been reported following ocean currents, traveling west from the southern region of the Trench and have been blamed for a large number of fish kills in the region.

Annie smiled, and turned to the next article.



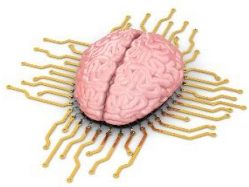
Karl D. Klicker (Captain of Marines, Ret.) is a career professional in multiple industries, including 25 years in Navy and Marine Corps Intelligence; industrial education and training (General Motors, NASA/International Space Station, and ENRON) – 10 years; teaching as an adjunct professor for 20 universities while overlapping these careers; and as a contractor supporting the US Special Operations Enterprise in PSYOP, Inter-Agency planning, and developing Strategy and Operational Art and Design solutions since 2008. He completed a B.A. in English



Science Fiction:  
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(Texas A&M) and both Masters and Doctoral Degrees (University of Southern California and Ball State) focused on Social Psychology while on active duty in the U.S. Navy and Marine Corps. Karl is also a career liar and story teller, with five books in print – including *Tested by Fire* (Leadership essays paired with grilling recipes and a fine Cabernet); *MERATHON* (which explores the science fiction of Energy Giant ENRON's 2001 financial collapse after which Karl filed for bankruptcy); and *INDOC* (a 500-page tome drawing parallels from recruitment and indoctrination into the Marine Corps and al-Qaida, based on academic credentials, personal experience in the Marine Corps, and a tour in Fallujah in 2006-07). Karl's first children's book has been out since 2013 in both English and Spanish: *A CLOUD FOR MY BIRTHDAY* as *UNA NUBE PARA MI CUMPLEANOS*, with nine more children's books in various stages of production. I'm on Linked-In and my books are on Amazon – the first two in Kindle format.



## Something Old, Something New

By Darren Carter

*As we have seen, the power of artificial intelligence has transformed the "art" of war. The mere thought of moving troops, tanks and artillery across a battlefield is as outdated as cavalry on horseback. Since the Galadine Conflict of 2027, it has been clear that large-scale war would be fought by technology -- by armies of bots and droids orchestrated by tactical AI operations systems, working relentlessly to fulfill the strategic objectives of their human masters. But not all conflicts are war. In fact, most are not. Many of the most hostile threats operate on the micro, as opposed to the macro, level. Small groups of individuals, acting with highly erratic ideologies that defy even the most sophisticated AI analysis. Experience has shown time and again that the fewer variables involved, the less accurate AI predictive reasoning is. And when the variables are a single man, or a small, rogue band of individuals, AI analysis breaks down completely. The algorithms that are so successful on the battlefield struggle when dealing with individual human action. For this reason, the realm of the strike team -- highly trained men and women, armed with sophisticated technology, but wielding the power of the human mind -- will remain a foremost resource of the United States Army.*

-- Brigadier General Susan Mosley, speaking at the Fourth Global Conference on North American Defense, April 19-24, 2035

*Wars may be fought with weapons, but they are won by men.*

-- General George S. Patton

At 0200 hours, 128 gigajoules of energy surged into the electromagnetic rails lining a reinforced concrete tunnel beneath the ground at Fort Benning, and the Type-4 Reentry Pod accelerated from standstill to Mach 4 in 3.7 seconds. TheT4RP ("TARP" in official Army lingo; or "coffin" as the grunts referred to them) screamed into the sky, hurtling towards the lower atmosphere.

Inside the TARP, the supine form of First Lieutenant Javier Nuygen lay unconscious, suspended in thick yellow shock gel. With a TARP takeoff generating over 60 g's of acceleration, no living organism could survive the compression unaided.

After a 118-minute trip through the cold silence of near-space, stabilization fins slid out from the pod's surface, and its internal computers began guiding the craft towards the desert plains of Kuristan. At 300 meters, a paper-thin nanocarbon chute deployed, arresting the pod's decent with alarming effectiveness. Thirty seconds later, the pod touched down on the rocky soil, sending a small plume of debris into the air. In the night sky the pale moon gleamed dully off of the pod's slate-gray skin, the moonlight dancing across the pod's scorching surface in violent waves.

As the pod settled, vents opened and the shock gel began draining. At the same time, Lt. Nuygen's ExoSuit began pumping his body with amphetamines. Consciousness came to the lieutenant, and he lifted himself out of the pod on wobbly legs. A wave of nausea rippled



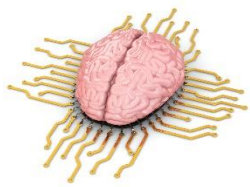
through his midsection as he began sloughing the gel off with his hands. A TARP was unequaled in terms of its effectiveness -- it could deliver Army assets anywhere in the world in less than two hours. But providing a pleasant ride for its cargo was not part of the deal.

Taking a couple of steps, Nuygen made a quick survey of his surroundings. The pod was stealthed but you could never tell if an unfriendly sensor had managed to penetrate the camouflage and register his descent. Sensing nothing unexpected, Nuygen activated his E-Shadow. The E-Shadow was a sophisticated piece of AI software that ran over the lieutenant's neural net, a delicate web of metallic hydrogen filaments laced through his brain. The E-Shadow gave Nuygen powerful augmentation: enhanced memory, in-vision iconography, the ability to interface with almost any network within range; and, of course, access to highly encrypted military communications channels.

The E-Shadow began running a comprehensive diagnostic on Nuygen and his ExoSuit. The DynalIndustries Series V suit was the absolute pinnacle of bioengineering technology. Powered by a micropile thorium reactor (affectionately called a "Coke can" by the grunts), the ExoSuit was a fully weaponized exo-skeleton of chromium-magnesium alloy that gave a soldier like Nuygen a massive boost in terms of strength, endurance and firepower. When fully engaged, the E-Shadow interfaced so smoothly with the ExoSuit that Nuygen really couldn't distinguish where his abilities ended and the suit's began.

After a few moments, a dull green icon appeared in Nuygen's vision, letting him know that his E-Shadow had completed its diagnostics and everything was in order. The lieutenant immediately sent an encrypted microburst transmission to one of the GBaND military command satellites that hurtled across space in LEO orbit. Two seconds later, a reply transmission was received: there were no changes to the target or the objective; the mission as-planned was a "go." Activating his ExoSuit's midrange sensors, Nuygen surveyed the desolate plains and plateaus that covered the 41 kilometers to Kyrat. On any given day, Kyrat was a rather unremarkable mid-sized industrial city of four million inhabitants that eked out a living copying and trading last-gen technologies. Today, however, Kyrat also happened to house the single largest biological threat to humanity.

In the year 2049, the largest threats to civilization were not the ones you could see. Rather, they lurked beneath the surface, gestating in the crowded barrios and industrial complexes of the Earth's 12 billion inhabitants. Technology was researched, developed, commercialized, stolen, copied and cloned with incredible speed. The hurdles for motivated groups of people to assemble the requisite components to produce sophisticated biological or nuclear weapons were not high. Pshperic, an extremely advanced military AI system rumored to be quasi-sentient, had seen something that alarmed it -- and resulted in Nuygen being ferretted to Kyrat on six hours notice.



After re-confirming the mission parameters with the GBaND, Nuygen killed the comm link. His E-Shadow sent an order the inert TARP pod and with a series of clicks, an Auxiliary Support Pack detached itself from the rear of the craft. Current military strategy called for three types of support bots for a soldier on the ground. As the Pack's various hatches began to open, the bots spilled out.

First came the Swarm, a collective hive of what looked like miniature metallic dragonflies. With amazing agility and speed, the Swarm was primarily responsible for maintaining the lieutenant's intelligence grid. Constantly monitoring the environment and both actively and passively scanning for threats, the Swarm provided real-time situational awareness to the E-Shadow.

Following the Swarm were the Snakes, scurrying out from the Pack like something from a horror movie. Each one-meter in length, the Snakes moved through a peristaltic motion that mimicked their namesake with eerie accuracy. With an optically inert coating, the Snakes were difficult to see when moving, and practically invisible when stationary. They were excellent at infrastructure sabotage; they could also deliver a range of incapacitation toxins to human targets.

Bringing up the rear, a pair of Crabs emerged. Each about the size of a pony, they picked their way cautiously out of the Pack, bristling with an array of hardware. Strictly offensive, each Crab carried enough munitions to level a small town. Calling upon the Crabs for help was a likely indication that a plan was going awry.

Nuygen's E-Shadow began sending commands to the bots. With subdued shuffles and hums, they spread out, forming a web of surveillance and defense around him. The Snakes and the Swarm dissolved into the night, and the Crabs scurried close to the ground, hiding in the shadows. The bots began feeding visual, thermal, seismic and dozens of other types of data to his E-Shadow, that in turn began scrubbing the data, running scenario analyses and piping summaries and recommendations into Nuygen's vision. Satisfied that his support was in order, the lieutenant flexed his ExoSuit-assisted legs and began trotting at 20 kph towards Kyrat.

This far from the city, the land was empty and deserted. Setting his E-Shadow into a semi-autonomous mode, the lieutenant relinquished control of his legs and felt the AI take over his ExoSuit. With the grace of a dancer, the E-Shadow sped him forward, avoiding the myriad crags and outcrops with almost thoughtless ease.

Freed from having to watch his step, Nuygen pulled up the original threat assessment compiled by Pshperic. Pshperic's logic was said to be beyond human understanding -- after all, it had been programmed by a computer. And that computer, of course, had been programmed by a computer, that was programmed by a computer, etc. Human experts had lost the ability to comprehend the billions of line of machine code that powered modern AIs. As Nuygen poured over the report scrolling through his vision, he was drawn to the three seemingly unrelated facts had piqued Pshperic's interest:



1. a graduate student at UCSD majoring biochemistry went on sabbatical, ostensibly to begin work on his dissertation regarding apoptosis; he was currently overdue to return to his university, and checks of his colleagues' email traffic showed they did not know where he was or why he was missing;
2. a distributed hacker network penetrated the firewall of a Chinese pharmaceutical research facility, stealing four terabytes of data related to rDNA derivatives of the solanum-3 virus; and
3. a nondescript warehouse in an industrial district in Kyrat was consuming 9.3% more power than normal.

While no one knew exactly what data sources Pspheric could access, or what other AI's it communicated with, its abilities were universally regarded as vast and deep. Scanning through the rest of the report, Nuygen saw that the AI had tracked down copies of birth certificates linking the grad student's family to Kuristan, emails expressing sympathy towards counter-government groups, a flurry of logistical records tracking gene sequencers and nucleotide enzymes through various ports and shell legal entities to wind up in Kyrat. After painting the target, Pspheric had honed in, accessing 8mm satellite imagery and global facial recognition databases to track everyone and everything entering or exiting the suspect warehouse. Seventy-two hours later, Pspheric computed an 86.3% probability that the resources in Kyrat were being used to manufacture a Stage 7 viral weapon with pan-global destructive capabilities.

A flashing yellow icon pulled Nuygen's attention from the report. The barren landscape was showing signs of population: farms, rudimentary irrigation systems, packed-gravel roads. The Swarm was picking up contact points as the presence of technology began to grow.

The initial contacts were unsecured local nets connecting small agricultural cooperatives to other local industries. Slow, latency-ridden and unintelligent, the Swarm did little beyond post their existence to the E-Shadow as they were encountered. A rainstorm would represent a greater threat than these primitive networks.

But Nuygen knew that would evolve rapidly. His eyes scanned the yellow icons popping up and fading with faint afterimages as the Swarm encountered and dismissed a growing number of contacts.

Suddenly, a red diamond flashed before his eyes. The data tumbling from the diamond showed it to be a carrier-class deep wave scanner. Nuygen saw the Swarm converge on the scanner, a blizzard of small white icons burying the red symbol. But their jamming power was limited and Nuygen's own sensors lit up, indicating the scanner had penetrated his cloaking.

On his screen he saw half a dozen Snakes scream towards the scanner. At the same time the Crabs closed rank, positioning themselves to unleash destruction if Nuygen were compromised. Anyone with the resources to deploy carrier-class surveillance undoubtedly had formidable





firepower in the area backing it up. Watching the screen, Nuygen felt powerless as the electrical battle waged, the scanner seeking to confirm his presence, the Snakes and Swarm clouding the air with a storm of electrical warfare.

Suddenly, there was a flash across his screen, and the red diamond threat disappeared. Reading the data, it looked like a Snake was able to penetrate the scanner's hardened bunker and self-detonate, taking the scanner offline. Nuygen held his breath, waiting for some form of retaliation. It did not come; the scanner had been disabled before it could raise the alarm. Whoever was running the scanner was sure to be aware of its "malfunction," but the time needed to investigate would be measured in incremental minutes not hours. Sending a microburst signal to the GBaND satellite, he alerted command to the heightened risk of detection. The GBaND immediately told him to proceed as rapidly as possible.

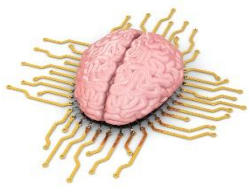
Nuygen ordered his ExoSuit to increase power, and the lieutenant went blazing over the rocky soil at 45 kph. At such a speed, his ability to remain unnoticed was significantly compromised, but he knew the encounter with the scanner would bring an array of unfriendly attention his way. Kyrat was coming closer by the minute, and his E-Shadow reoriented his bots, ignoring all but the most pronounced threats as he flew by. Nuygen knew his cover would be blown, but he was hopeful that he could reestablish it within the city itself.

Pushing his ExoSuit to its limit, the lieutenant screamed the last two kilometers into the shelter of the city. The rabbit warren of Kyrat's tangled buildings and infrastructure enveloped Nuygen like a forest, and he slid into the comforting gloom of winding alleyway.

Nuygen's bots melted into the urban background with him, slowing down and mimicking his own move to ground. Within Kyrat, the prevalence of surveillance and detection assets – civilian, government and military – made avoiding detection futile if he was being actively sought. However, Nuygen believed he still had some time on his side, and a decent chance to make it to the warehouse unmolested. The sky was still dark, but with local time registering 0430, life would come to the streets in short order.

He moved quickly but quietly through a maze of alleys and side streets, his E-Shadow guiding him away from the denser concentrations of surveillance. Kyrat was like any other industrial town, with block after block of low, dusty office buildings and industrial parks, unadorned and unremarkable. With the twin benefits of a dark sky and his ExoSuit's stealth coatings, he made good progress towards his target undetected.

Five hundred meters away, the lieutenant paused in a recessed garage and ordered his Swarm and Snakes forward. The bots were in a passive mode, not wanting to trip any alarms with active interrogation pings. As the bots stationed themselves around the building, the E-Shadow began constructing a detailed, multispectral visual feed for Nuygen to study.



The feed confirmed much of what the detailed satellite imagery had shown during the mission briefing. But with this degree of proximity, new details emerged to Nuygen's trained eyes. Efforts had clearly been made to make the building look no different than any other industrial warehouse in the area. But a careful inspection showed Falkniven-reinforcement along load-bearing walls, series of well-concealed balistraria that could deliver defensive measures against intruders and, most interestingly, a pair of 3PH isolation transformers capable of managing power in the gigavolt-amp range. There was no way to confirm how many people were inside, but prior satellite surveillance estimated a rotating force of three dozen, one-third scientific staff, two-thirds security.

With a faint glow starting to lighten the eastern sky, Nuygen knew his time was running out. He ordered his Swarm and Snakes forward, sacrificing some level of stealth for better positioning and speed. His Crabs naturally flanked him as he began traversing the final distance to the target. The ExoSuit pumped a light dose of levoamphetamine into his blood, increasing his alertness and quickening his reflexes.

Three hundred meters. Two hundred. One hundred. Nuygen's attention darted back and forth from the E-Shadow feed showing him and his bots closing on the target to the target itself, looking for any sign that he had been spotted. That he had gotten this close without triggering an alarm seemed almost too good to be true. It turned out that it was.

A high-pitched crack sounded and resonated in the air, and a dozen alarms flashed in Nuygen's vision from his ExoSuit. The massive electromagnetic pulse explained the powerful transformers at the building. Seventy percent of his Swarm was lost immediately, their circuitry fried by the pulse. One-third of the Snakes were disabled as well. The shape of the damage wave showed fairly advanced magnetic pulse-forming technology at play, focusing the EMP on Nuygen and preventing damage elsewhere.

After several shaky seconds, the lieutenant's E-Shadow managed to run a rudimentary diagnostic. The ExoSuit's hardened circuits and redundancies had held up reasonably well, with the suit maintaining 84% effectiveness. The Crabs, as well, were more or less intact, their design built to endure just such an electronic attack.

Nuygen knew he was firmly in the scope of the enemy, and he did the only thing he could do -- he attacked. He sent the remaining Swarm bots raining onto the transformers, jamming any signals coming to or from them, and self-destructing themselves by wedging their conductive bodies into electrical nodes, trying to force the cooling grid to overheat. The Snakes threw themselves against the building, wedging themselves inside through any path they could find. Most fell to the array of countermeasures pouring from the balistaria, a mélange killbots with varying weaponry. But the Snakes that did make it inside were effective, attacking any humans they encountered with dart-delivered incapacitation toxins, and wrecking havoc with the building's electronics.



Nuygen crouched behind a small service shed as the Crabs sprinted ahead. They stepped in front of a reinforced loading bay door, and launched a pair of depleted uranium rockets that blew the thick steel apart. As he was rising to sprint towards the opening, an electrolaser blew one of the Crabs to pieces. Straining to see through the smoke and debris, Nuygen saw the weapon mounted on a platform inside. It was Chinese, a Xisushan Model 7, about as sophisticated a weapon that existed, and not something the Chinese military would have parted with willingly.

Instinctively, Nuygen sent frantic orders to the remaining Crab. The bot launched itself into the space, a blizzard of munitions converging on the electrolaser just as it refocused and reduced the Crab to subatomic particles. Praying that the damage the Crab managed to inflict was enough, Nuygen sprinted into the building.

As he came, his ExoSuit charged a pair of 12GHz plasma rifles built into the suit's arms. Nuygen immediately sent two superheated plasma streams into the wreckage of the electrolaser, just in case the damage the Crab inflicted was not enough.

Charging through the smoke, Nuygen unleashed a rain of destruction, his ExoSuit sending munitions against anything the E-Shadow could conceivably view as a threat. While the building's technological security was formidable, the human component was much less so. Upon seeing Nuygen in his Series V ExoSuit, they scrambled for an exit, knowing their own last-gen hardware was close to useless. Ignoring the fleeing men, Nuygen flew through the building, pouring destruction on the technological forces trying to stop him. Towards the back of the building, he screeched to a halt in front of what he was seeking: the sequencing lab.

With transparent, triple-pane bulletproof glass walls, the lab loomed before him like a giant cube. The gene sequencers inside were self-contained, operated by specialized robots locked inside with them. Of their human masters, no trace remained, but a half-full cup of tea near the control panel suggested Nuygen had just missed them.

Approaching the panel, Nuygen sent a communication probe into the universal data port, and his E-Shadow took over. With sophisticated hacking programs, the E-Shadow was able to drain the lab's systems in less than a minute. The data showed that the sequencing was in its final phase. In twenty-four hours, the racks of light blue fluid inside the cube would be fully weaponized, suspended in an aerosol that could be deployed across cities. Preliminary death tolls were estimated in the 250 million area.

Staring grimly at the data, Nuygen deployed a series of P9 charges, surrounding the cube. The combined firepower was a lot, on the order of 0.15 kilotons. Overkill, perhaps, but Nuygen could not take any chances of the lab or its partially-sequenced virus surviving.



He was sending armament codes to the charges when out of nowhere a RPG rammed directly into him. Impacting his ExoSuit at nearly the speed of sound, the kinetic force blasted Nuygen off of his feet while an explosive concussion engulfed him.

The suit acted instinctively, sealing itself tight against the blast. But the impact had penetrated its armor, ripping into Nuygen's left quadriceps and severing his femoral vein. The ExoSuit sensed his injury, and constricted violently around the lieutenant's leg. Blood clotting agents and pain blockers flooded the lieutenant's system as the suit tried to stem the bleeding. Instinctively, Nuygen began reaching down towards the damaged area when the suit suddenly froze.

Desperately, the lieutenant struggled as the E-Shadow sent a blizzard of commands to the inert suit. His eyes scanning around him, Nuygen saw the cause of the suit's malfunction. A traction web generator, secreted in a ceiling nook, had locked onto his suit and frozen it. Somehow its presence had not been registered by his E-Shadow and now Nuygen was paying the price.

Paralyzed, the lieutenant struggled uselessly against the suit's inert mass. Hopeless. He could not so much as rollover, let alone arm the charges and destroy the lab. His E-Shadow made a concurrent assessment of his predicament, and a small orange icon began slowly blinking in Nuygen's vision. A Strategic Defense Platform was coming over the horizon, and in 114 seconds would be able to target Kyrat.

Heavily cloaked, an SDP was an orbiting platform, the existence of which was vehemently denied by the government. Representing the ultimate weaponization of space, an SDP carried a catalog of extreme possibilities. From orbit, it could rain strategic nuclear munitions, HEIR lasers, thermal flechettes, and sterilization fogs upon a target. Using one brought a heavy cost - in this case, his E-Shadow estimated 250,000 Kyrat civilian deaths. But the pandemic threat represented by the viral agents in the warehouse tipped the balance.

Nuygen stared at the blinking orange icon, his mind searching frantically for an option, for a choice. He knew his mission, his duty; he knew what was at stake and he would do what he must. But he was so close -- there must be some other option, some altern --

His pistol, Nuygen's mind screamed at him. His Beretta M9 semiautomatic 9mm sidearm. The exact sidearm carried by his grandfather during the Iraq War. The weapon given to Nuygen by the old man when he completed basic training. The sidearm Nuygen had carried with him on every one of his missions as a good luck charm.

The Beretta was a purely mechanical weapon, utilizing a chemical explosive to launch a ballistic round. There were no electronics to jam, no electronics to fail. The traction web would not affect it.

Gritting his teeth against the pain, Nuygen twisted his right wrist harshly toward his forearm. On the third try, he managed to grasp the emergency release switch and freed his arm from the



exoskeleton. Pushing awkwardly against the suit's weight, the lieutenant reached towards a storage chamber in the ExoSuit and pulled out the Beretta. With an awkward twisting of his torso, Nuygen drew the best bead he could on the web generator. Focusing on a dull concave indentation that should house the central CPU, he exhaled slowly and pulled the trigger.

Nine grams of lead exited the barrel of the Beretta at 400 meters per second and slammed into the generator's CPU like a sledgehammer. Instantly the web generator failed and Nuygen felt his ExoSuit come roaring back to life. Rising from the ground, his injured leg sending torrents of pain up his side, Nuygen finishing arming the charges and initiated a 20 second fuse delay. Then he began running as fast as the impaired suit and his impaired leg could move him.

He was sixty meters from the warehouse, flying down a narrow twisting alley when he felt the ground shake as the charges detonated. The sequencing lab and its contents were engulfed in a 2,000 degree Celsius blast of roaring heat and destruction.

Without breaking stride, Nuygen charged towards the edge of Kyrat, pinging the GBaND for an extraction solution as he left. The GBaND was silent, presumably waiting for satellite confirmation that the target had been destroyed. After a nerve-racking two minutes, an encrypted set of coordinates was received by the E-Shadow. Sighing, the lieutenant gritted himself for the 120 kilometer jaunt to the pick-up point, and ordered another dose of painkillers from his ExoSuit.

As he ran, he kept his Beretta clinched tightly in his fist. It was ancient, it was outdated. It was an antique. And it had saved his life, as well as the civilian lives that would have been sacrificed if the SDP were called into service. Call him superstitious, but Nuygen liked the feel of the gun in his hand, and he was not going to release it until he was on a transport back home.

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Darren Carter holds degrees from Texas A&M University and the University of Southern California. He has spent the last twenty years working on Wall Street where he focuses on technology, media, and telecommunications companies. An avid reader, Darren became hooked on science fiction when he read Isaac Asimov's *Foundation* series as a youth. He currently lives in New York with his family.



## The Weapons of World War Four By Oren Hammerquist

Senior Chief Special Warrant Kyle Barristan raised an eyebrow as he watched the Sergeant survey their equipment. Wisely, he asked permission before entering the ACT—Advanced Reactionary Technology—squad tent. Unwisely, the Sergeant seemed to have forgotten his purpose and surveyed the ACT equipment. By necessity the existence of most of the equipment had been declassified, but ACT Squad members—the famed Chrome Caps—still discouraged random curiosity.

The tent offered a great deal to satisfy such random curiosity. Mixed among the Army cots designed in the Vietnam conflict—never fix something that worked—were neat arrays and rows of micro-drones called Skippers and Gnats. Neatly hung to one side were six body armor suits looking like a cross between a wetsuit and a still suit from Dune. Computers and advanced weaponry in a canvas tent—though lined with insulating material—formed a juxtaposition every bit as strange as a smartphone in a World War I trench. Only the six Special Warrant officers—specially trained and selected to use this advanced weaponry—seemed at home both with the technology and without.

The Sergeant who entered the tent didn't look old enough to drink, and he may not be in most states. The silver letter "I" under his stripes indicated he'd entered on a technology rank waiver. He must have at least a bachelor's degree in one of the computer sciences—of which there seemed to be a new one every year—but not a master's yet or he'd be a Staff Sergeant. Since most tech waivers finished most of their college in advanced placement classes in high school, chances were good the Sergeant was twenty or younger.

"Did you need something, Sergeant?" asked Barristan.

"This is BAS, sir," the young man replied.

"What do you want?"

"Top asked me to get a translator."

"Why?" Barristan demanded.

"Some Wadi at the gate spittin' Gibberish," the Sergeant said.

"Then go ask the translator," Barristan said.

"He's in route to Landstuhl," the Sergeant said. "Got hit on patrol last night. I thought you knew."

The six warrants sighed. This only created more work for them. "I'll send someone right out, Sergeant," Barristan said.

Barristan pulled his "chrome cap" from the charging case beneath the bunk. When the eye visor was raised, the assembly vaguely resembled a silver baseball cap with a black bill. Except, of course, that the assembly comprised a helmet rather than a hat. Still, the name "chrome cap" stuck partially due to the choice to wear light-gray berets in uniform.

The front of the mask looked like a cross between a fighter pilot oxygen mask and a





chemical protective mask. The goggles, with wearer-selected variable tint, allowed projection of augmented reality (AR) graphics and text alerts. Barriston grew up on classic science fiction, and felt all the helmets needed to look more like a Cylon was a red light running across the eyes.

"We can do that, Senior," said Salish.

Tomms added, "Yeah, you know Liu is the world's greatest conversationalist.

The Chief Special Warrant nodded once without looking away from his book.

Barristan shook his head. "I have to take a piss anyway. This probably isn't good news, so let's get the Skippers and Gnats ready. Check the armor to make sure the batteries are good and the Kevlar is in good shape."

The others nodded and Smith asked, "You actually expecting bad news here?"

"I've never known a local to bring good news," he said.

\* \* \*

The heat outside the tent hit Barristan like a wall. Even at the other end of the one-square-kilometer combat outpost, mirages flowed in the heat. Barristan's uncle used to talk about the heat from his time in Afghanistan. Heat played tricks on the body. At 120 degrees, sweat evaporated so quickly that someone walking from a cooled area into the heat felt a momentary chill. That was thirty-five years and ten degrees earlier. Barristan clipped the pistol belt on and donned his gloves.

Barristan turned the corner toward the gate wearing only his pants, t-shirt, boots, and chrome helmet. The local stepped backwards with wide eyes. A gesture from his left hand turned his translator on. As he lifted the goggles, he held up a hand.

As Barristan spoke English, the speaker outside the mask said in Uzbek, "Don't be afraid. It is only a helmet."

The man looked suspiciously for a moment before nodding. Barristan lowered the visor and activated his millimeter-wave scanner. The AR scanner highlighted items of interest inside the man's pockets. The only item of concern to Barristan was a long, thin, curving item hanging from what appeared to be a chain around his neck. It was clearly a knife, but it could be for religious purposes. Or, it could be for him. Best keep out of arm's length.

Translator reactivated, Barristan said, "Can I help you?"

The man spoke rapidly in his native tongue as the suit translated to a machine voice inside the headset. Unfortunately, the words initially made little sense:

This man was not local. It raised a red flag.

"Search dialect," he ordered the onboard computer.

As the man continue to speak in partially translated speech, the computer ran text across his visor. Finally, it said, "Northern Uzbek Colloquial 7: 85%."

"Switch translation."

Immediately, the man's words began to make sense.

"Can you understand me better now?" Barristan asked.

The man again looked surprised. Barristan knew he wanted to ask how the robot-man



could switch to a local dialect; the fact that the man did not say this raised the second red flag.

Barristan wouldn't have tried to explain the helmet even if the man had asked anyway—he'd never do that again. As a Special Warrant, he once tried to explain computers to a farmer who didn't even have air conditioning. Thankfully, declaring people witches was a European thing. By the end of his failed explanation, Barristan himself had begun to wonder if he was a wizard of some sort.

Barristan explained in auto-translated, colloquial Uzbek, "I did not understand you at first. Please tell me again what you need."

"I beg you in the name of Allah to help our village. Men came in with IEDs, hand grenades, and many other weapons. Please. Will you help us?"

Barristan asked, "Where is your village?"

The man gave directions up the main road and left at the first "T." Barristan promised they would consider it and resolved to himself to take any route other than the one given by the supposed villager.

In the tent, Barristan related the cry for help and the dialect issue. Tomms asked, "You think it's a trap?"

"No doubt in my mind," Barristan said.

"We're going to walk into it anyway, aren't we?" Salish asked.

"Isn't that what Rangers do best, Rick?" Barristan asked.

A ten-legged sniffer drone crawled out from under a table and nuzzled Barristan's foot. Despite looking like the bottom half of a foot-long cockroach, the team considered Odie—OD-E or Observation Drone-Explosives—a pet. It was one of seven which the team deployed on missions, but it was the friendliest one. It was therefore the only OD-E called Odie and had a decent rendering of the Garfield sidekick painted on top.

"I signed up for the cool toys," Smith said, offering her own foot to be nuzzled by Odie. "But I'm always up for a fight."

None of the four highly-educated Special Warrants (four holding one or more PhDs) could explain the personality exhibited by the sniffer drones. "I want to roll in one hour," Barristan said.

"We'll be down one sniffer," Campbell said. "Wallie picked up some debris on the last search."

"Wallie always picks up debris," Smith grumbled.

"Six is plenty," Barristan said. "Tomms, talk to me about the armor."

"Batteries are charged and I see no damage or abrasions," he said. "I'll give it a once over again anyway just to make sure."

"I can help you," Smith offered. "I'll check magnetic alignment on the rigidizing armor."

"That's good," Barristan said. "Salish, I need you to make sure our translation databanks have all the languages we need. That Uzbek dialect required an uplink to our server."

"No problem, Senior," he said. "I'll check the droid-helmets while I'm at it."



Campbell was already hard at work preparing the 106 drones—50 skippers, 50 gnats, and six sniffers—they would use on this mission. Barristan felt she probably liked drones better than people, but he didn't dare say anything aloud. The drones seemed to like her better than most people too.

Forty minutes later, all six team members donned their form-fitting body armor. The flexible material was a tenth of the weight of ceramic plates used in standard body armor. Despite the reduced weight, it was five times less penetrable than ceramic—capable of stopping multiple AK-47 rounds without damage—and twenty times less penetrable than Kevlar alone. Though the Army called it "liquid body armor," it actually had a gel between the layers allowing it to redistribute force from small projectiles across a much larger surface area. The concept was similar to placing an egg in the palm of your hand and squeezing. It won't break because the force is spread out evenly but you could quite easily push a finger through the shell. A straight pin, even easier.

Some stated that being shot felt like being kicked on one entire side of your body at once. It could also reduce the point impact of a bullet traveling at 2700 feet per second to being shot by an over speed paintball. It left bruises occasionally, but it was better than letting the bullet pass through the wearer's body.

To make the armor even stronger, a layer of fabric filled with metal fibers in mesh weave covered the entire body. When power was applied, this layer became instantly as harder than steel. The most important element of the sensors was the ability to sense explosions and rigidize the entire body. Because the suit must assume only one shape, it pulled the body into a modified fetal position in the event of an explosion.

The AR-capable goggles imposed a path on the landscape as they walked. Though this mission used the path (marked in green today) primarily for situational awareness, the suit computers were accurate enough to plot a safe walking path through a known minefield. Every member of the team had tested that system in school; though those mines were filled with paint, they also gave a minor electric shock to remind ACT trainees not to stray from paths marked red.

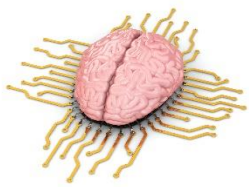
"Okay, Campbell, turn the sniffers loose," Barristan said.

Though "turning the drones loose" involved choosing the "random" setting, there seemed to be nothing random about the way the drones assembled. As expected, Odie took charge. For some reason, Odie always took charge, which none of the ACT members could explain. Immediately, Race, Drone 6 of 6, sent a message warning of partially degraded operations. Another ghost in the machine, Race always acted as a communications.

"What's that mean?" Barristan asked.

"The drones are complaining that Wallie isn't with them," Campbell explained.

The drones had already fallen into an M-shaped formation with Race in the center and rear to aid communications. The legs of the formation pulsed slightly with terrain and search patterns, but they maintained a surprisingly consistent pattern.



Knowing they were likely walking into a trap, the six were understandably quiet. Though whoever had moved into the village expected them to come through the main road—a choke point with plenty of elevated firing positions—they might also have backup plans for the entire perimeter.

Apparently, the silence had become too oppressive for Salish. "So I'm delayed on my dissertation, but I'm getting close again," Salish explained.

"Cut the chatter," Barristan said.

The two apologized in unison, but the silence became oppressive again. Barristan said, "Okay, go to hyper. Use radio for mission updates."

"Hyper" was a special capability only ACT droid-helmets possessed. In addition to anti-jam radio capabilities, the ACT could turn on hypersonic voice transmitters to translate speech from inside the helmet to sound waves above the human range of hearing.

This system of sound transmissions had several benefits over radio transmissions. First, radio waves could not travel through solid objects like sound waves. Second, the sound transmitter/receiver assembly took a third of the power required for a radio. Third, the sonic system could listen and transmit simultaneously unlike radio.

"I was complete with all my research and I was starting to compile it when someone over at MIT released almost the exact same study on machine language," Salish said. "His study was better. Mine became irrelevant."

A warning from one of the drones, Mr. Crabs this time, interrupted. Barristan turned to see an arrow floating above the landscape in his visor. Mr. Crabs, true to his name, scuttled sideways as it found the perimeter of the buried explosives. AR lines formed on the ground as the drone relayed, through Race, its findings. The boundary of the superimposed-graphic took shape.

"Weapons cache," Barristan said. "Let's mark it so regulars can take care of it. Our mission is onward."

At 100 meters from the village, a single crack rang out and Liu staggered backwards a step. All six AR goggles registered small-arms fire and placed an arrow on the land to indicate the general direction.

"You okay, Liu?" Barristan asked over radio as they all lay in cover.

"I'm fine, Senior."

The suit-mounted detectors only gave a general direction and that only when the bullet would strike or nearly strike the target. It was exceedingly clear what direction the shots came from without the technology. Unfortunately, the shooters held excellent positions in heavy cover.

"Skippers and Gnats," Barristan ordered.

"Skippers" were small bots about the size and shape of a ping-pong ball. Two metal flanges could retract and extend to make them roll and "skip" forward. The bots were "dumb bots" with no artificial intelligence. They had three purposes in life: move forward, stay



between 1.99 and 2.01 meters from all other Skippers, and transmit to a correlation server. The "gnats" were little more than flying versions of the Skippers.

A "ready" status blinked in visors and the six checked their arm displays showing the overview of the battlefield. Barristan drew two routes on his pad for the main assault force and flanking force. The other five nodded and prepared to move on his command.

"Give me smoke," Barristan ordered. The six sniffer drones released their smoke, obscuring the battlefield from the shooters. Even completely obscured, the visors provided outlines of buildings in AR to the ACT team and laid the path on the ground. The position of the shooters also showed red through the smoke.

Team A (the assault force consisting of Liu, Tomms, and Campbell) bounded forward out of the smoke into cover, firing on the move. They continued to lay down suppressing fire of their 9mm MP5 SMG on full auto. Immediately, Team B (the flanking force with Baristan, Salish, and Smith) moved to the right within the smoke to a side street revealed by the Skippers. Team A emptied their first magazine (100 rounds each) and dropped again into full cover. Team B rushed forward into the city streets as the four enemy jumped out of cover and began to fire.

AR goggles superimposed the live feed of the four shooters through walls as well as friendlies. No chance of shooting one's own. Silently and without firing a shot, Team B moved behind the shooters and within 100 yards. The weapons contained a toggle switch on the foregrip allowing the team to select targets as their own.

Barristan ordered, "Go." And three weapons fired simultaneously. "Moving in," Barristan said.

Two of the four (Salish's two) were dead. After scanning the bodies with millimeter-wave scanners, Salish and Smith rendered aid.

Team A moved forward to sweep past the flanking team in case there were more shooters. The computer added Team B from the Gnat and Skipper feeds to the AR display.

"Senior, we'll need a MEDEVAC for this guy," Salish said.

"Same here," Smith said. "He's priority."

"Campbell, are we clear?" Barristan asked over the radio.

"Yes, Senior."

"Okay, call 'em back," ordered Barristan ordered, referring to the "callback" function of the Skippers and Gnats. They could all be turned off instantly if necessary—letting the Gnats fall from the sky—but there was no reason to risk damaging the drones despite how cheap they were. "Have the Sniffers check around too just in case. Smith call a chopper if they have it. Tomms and Liu, let's find someone in charge."

\* \* \*

The windows and alleys along the streets began to swarm with half-seen civilians. Barristan expected this. In towns like this, built of mud walls with wooden supports, the team often inspired fear. The villagers probably lacked the words to even describe what they saw. Barristan walked directly up to one of the men and switched his suit to translation.



"Take me to your leader," he ordered, and the ultrasonic decoder registered laughter from Tomms. Liu never laughed at this joke—and Barristan made it every mission. Then again, the villagers didn't either. Some things did not translate.

Helicopters picked up the two wounded prisoners, Campbell gathered and redistributed the Skippers and Gnats, and the Sniffers finished a sweep of the town perimeter. Now the six gathered in the center of town waiting the leader.

People slowly crept forward now. They would come up and touch what they had been afraid of earlier. Though it still unnerved Barristan, it happened everywhere. Even Soldiers sometimes reacted by hiding first and touching second. Curiosity was perhaps the most human of all reactions.

An elderly man hobbled forward and Barristan stepped forward. "I wish you peace, sir," he said.

The old man shook his head. "Leave us."

Barristan assumed the remark was directed to one of the younger men beside him and continued, "There were four terrorists here. We have removed them and we will remove any other explosives and weapons you do not wish to remain here after them."

"No," the man said. "We wish you to leave. Leave our village. Now."

"Ungrateful sons of @\$%!@#," Salish noted. Barristan frowned, but the visor hid this from his subordinate and the ultrasonic hid Salish's words from the villagers.

"We removed dangerous men from your village," Barristan insisted.

"You are devils and you brought evil with you."

"Those men we killed, they were devils," Barristan argued. "If they come back, will you let us know?"

"When you come, they come," the old man said. "They were here because you were here. You will leave us forever or there will be more."

"What? Is he up for re-election?" Smith joked.

Tomms added, "Maybe for lead jack@\$%."

"Cut the chatter," Barristan said. Maybe the villagers couldn't hear it, but it distracted him.

Barristan said, "They asked us to come here and then shot at us. Why?"

The look of anger on the old man's face said either Barristan had said the wrong thing or the computer translated it incorrectly.

"They will not come if you go," the man insisted. "Go now."

The crowd now formed a tight circle around the team. The other five began asking the villagers to back away, not interested in being touched. Their pleas had no effect, and Barristan had a bad feeling in the pit of his stomach.

"We must look around your village," Barristan explained. "We found several places that might still hold weapons, and—"

"@\$%!" screamed Smith.





Barristan turned to see a woman with a bloody knife in her hand. Blood seeped through the Smith's fingers on her abdomen. Always a trade-off, what stopped edged weapons did not stop bullets and vice versa. Had she seen it coming, Smith might have activated the instant-rigidizing steel armor.

Reflex, Barristan drew his M1911 and shot the woman in the head. Now, the crowd scattered. For a moment, the streets were silent. Campbell and Tomms supported Smith.

"Let's move to cover," Barristan ordered, forgetting to take his translation matrix offline.

The order came too late. Barristan turned his head just in time to see a black object strike his visor. The glass did not shatter but spider-webbed. It took him several seconds to associate the damage with the rock that fell on his foot. Just as he recognized the source, a salvo of pebbles hit the team.

Liu was the only one to name the problem, "@#\$%ing slingshots."

The rocks travelled at 60-100 miles per hour: too slow to set off defensive sensors but fast enough to hurt. The limited vision on his left side reminded him that the relatively slow-moving rocks could still cause significant damage to their equipment.

"Let's move!"

The team hurried to the still marked path Team B used to flank. Salish took point as Barristan could not see the path on his AR any longer. When they came between buildings, the Salvo began to include heavier rocks dropped from above. Had the Gnats still been in the air, the team—except Barristan—could have seen the position and possibly fought back. Instead the team, slowed by the bleeding Smith, had no choice but endure the stoning.

One hundred meters from the edge of the city, Barristan felt hopeful, but his optimism was too early. The team members suddenly crumpled into the fetal position against their will. The acoustic and infrared sensors processed the explosion before the team even knew it had happened and took actions to protect the team. Mercifully, the automated rigidizing of their suits caused the pebbles to bounce away as if striking steel. The relief was short-lived as the explosion, designed to topple a wall, buried the team beneath a ton of rock.

The suits had a slightly higher tensile strength than steel in this position, but they would only hold so long. They had become boulders at the base of this rubble; eventually, the batteries on the armor would fail, the suits would return to fabric weight, and they would all be crushed. With an already broken display, Barristan could not see statuses of his team. He used voice commands to switch from translation mode to infrasonic. This would travel through the rubble better than the ultrasonic frequencies.

"Status report."

"Tomms okay for now."

"Salish okay."

"Campbell... my helmet is dented, but I think I'll be okay."

"Smith... Doesn't look good. I wasn't able to seal the wound."

"Senior, this is Liu. I think I'm near the rear of the pile. I can see some daylight."



"Just hold on a moment," Barristan said.

"Let me deactivate my suit and push up," Liu offered.

"No!" Barristan said. "Do not disengage. You have no idea how much weight is over you."

Barristan felt his suit begin to compress. It was far too early for his battery to get low. This meant that the rocks must have damaged the power source. Frankly, he was shocked it hadn't happened to the entire team.

"Liu, can you raise the sniffers?" Campbell asked. "I can't see anything but spiderwebs and black."

"Standby."

Several seconds felt like an hour. "I got Race," Liu said. "Apparently Odie left thirty seconds after the explosion. They have arrayed themselves in a line to act as relay stations to the base."

"Good thinking, Liu," Barristan said. He had to bite his lip to keep from screaming; the armor in his leg began to buckle and turn to fabric.

"I didn't do it," Liu said honestly. "I wish I had."

"Odie did it," Campbell said. Barristan knew she said this on faith alone—her display was likely worse than his. Regardless, he didn't question the assumption.

"We live through this," Tomms said, "I'm painting a medal on top of that cockroach. To hell with regulation."

"We live through this," Salish added, "I'm going to cite him in my dissertation."

Only three team members laughed. Barristan felt his leg slowly compressed beneath the tons of rock.

Barristan took a deep breath. "How long?"

The team was too silent and he knew why. There was no good reason for Barristan to ask this. He knew the speed of the Sniffers, the distance to the camp, and the reaction time of the quick reaction force. Barristan should have been able to do the math in his head while playing chess. Barristan and his failing power source had become the elephant in the room. They knew something was wrong. "Dammit, how long?"

"Sniffers move up to 60 kph," Campbell said. "It's 4.6 clicks to the outpost. It will take probably fifteen minutes for the tech guys to figure out how to talk to Odie. Thirty for QRF. Ten to get here. I say 62 minutes."

"Best case," Liu said. "Could be up to 90 if they can't figure out what Odie wants."

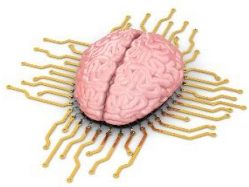
"What's wrong, Senior?" Salish asked.

"Rocks damaged my battery pack."

"How much power to you have?" Salish asked.

"My screen is completely busted," Barristan said. "There's a reddish glow in the top right. So not long."

"For @\$%'s sake, stop transmitting," Tomms said. "Save the power!"



Barristan's leg shattered and the other began to compress. His body now began to compress and he had trouble breathing. He used every ounce of strength to keep from screaming.

"Too late for that."

"We're getting you out," Liu promised. "Just hang in there."

"No. There's nothing you can do," Barristan said. No one spoke, but he knew five highly educated minds had reached the same conclusion he had and refused to admit it. "Trust me."

Liu spoke up, taking command as he should, "Smith, what about you?"

"Cold. Not good."

"We live through this," Tomms said, "I'm going to slaughter everyone in this @#\$%!@#\$ village."

"No you won't," Barristan said. "That's an order."

No reply.

"You know what Albert Einstein said?" Barristan asked, barely forcing the air out. "He said that whatever world war three looked like, world war four would be fought with sticks and stones."

Had it gone out? The red light on his visor was gone now. He felt the suit relax suddenly and there was a moment of calm before the rocks gave in to gravity. In that split second, he said a prayer, said a second prayer for Smith, said a third for the team, and saw the world go black.

\* \* \*

The Sniffer relay system began giving thirty-second updates to Liu. The engineer drones had been ordered to stop filling baskets and go move the boulders. They were powerful and slow; Liu was closer to accurate with his 90-minute guess. Would there be time to save Smith? She stopped talking ten minutes ago. Hopefully, the loss of blood would slow the bleeding. If she was still alive.

The rocks began to shift, and Liu found himself suddenly unencumbered. The AR was useless now—drones all crushed in the explosion and the route blocked by rocks. Liu wrenched his helmet off and shouted to the security team, "If you see anyone with a slingshot, shoot to kill!" With a second thought, he put the helmet back on and shouted this warning again through the translation matrix.

Liu grabbed ineffectively at rocks, trying to get where he had last seen Smith. Two people grabbed him from behind and pulled. A third was required before they could remove him from the pile. Engineer drones moved in and freed Tomms and Campbell next: the two who had been carrying Smith. They too began clawing at boulders, but the engineer drones understood their actions now. One robot lifted them gently from the pile and set them beside Liu. Liu placed a hand on their shoulders and they stood watching.

"We need a medic now!" Liu yelled.

Two medics rushed forward and lifted the still fetal Smith from the rubble. Aside from



the blood at the gash, she might be a rock herself. She had not deactivated her armor; it was a very bad sign. Liu rushed forward and used the arm band computer to turn the function off. Smith collapsed like a rag doll and the medics sliced through the liquid Kevlar like the knife that might have killed her.

Salish was finally free and the other three team members held him from rushing to her side. Their rifles had all been lost in the explosion and magazines likely destroyed. It was probably for the best, Liu reflected. It probably prevented a massacre.

The lifeless body of Barristan came out last—after the inoperable rifles—and seemed fluid rather than solid. The four still standing removed their caps and saluted their commander.

“She’s alive,” the medic announced, “but we’ve got to move her now.”

The MEDEVAC chopper was already landing outside, and the four Special Warrants pushed the medics away from the litter and sprinted toward the helicopter. The medics—still wearing ceramic-plated body armor—couldn’t keep the pace. They climbed breathless into the chopper a second before Liu waved it off.

They carried second litter, covered by an emergency blanket from someone’s kit, back to the base. The four ignored all questions from the regular Army Soldiers and let them provide security for the slow walk back carrying their dead commander. The sniffer drones formed a procession behind the four, and Race informed them all seven were present. So Wallie had come to pay his respects; Liu would never understand where these bots learned loyalty. Nor could he ever be thankful enough.

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Staff Sargent Oren Hammerquist is an Air Battle Systems Manager currently serving as the Section Sergeant in the Air Defense and Airspace Management (ADAM) Cell, 2nd Cavalry Regiment. He lives with his wife and four children in Rose Barracks, Vilseck, Germany. He holds a BA in Criminal justice and an MA in English and Creative Writing. In his off time, he writes and works heavily with the American Legion, the world's largest veteran service organization, as the Commander of his local post.



Memories of Cordite, Sinew, and Steel in a Non-Binary Future  
By Lieutenant Colonel Yukio Kuniyuki

“Distinguished guests, cadets, one and all!” a voice declared in almost perfect pitch, tone, and clarity among the 200 assembled guests, for some it was directly translated in another native language through a discrete earpiece. “Please welcome our special guest, Lieutenant Colonel Damien Price commander of the 1<sup>st</sup> Battalion, 72<sup>nd</sup> Armored Regiment. He is a leader who has dedicated 20 years to the service of our nation with operational deployments to Korea, Bangkok, Brazil, Azerbaijan, and India. He also led relief efforts to the Yellowstone quake in 2024 and the 2036 greater South Asia tsunami with joint task force 42. He is an esteemed alum of our school and holds Master degrees from the Combined Armor and Maneuver Center as well as the Command and General Staff College.”

*Once upon a time, we used to say, “Ladies and gentlemen,”* Price mused, blocking out the applause and trying to organize his thoughts as he made his way up to the elevated platform.

Cadets and gala attendees saw a grizzled officer walk up to a podium; *grizzled* by their standards. The only visible scars for Price were the trenches worn by worry at the edge of his eyes and he made no effort to hide the streaks of white lining his hair. In an age of augmented beauty, he shunned it. Some of his peers said he would never make general because he didn’t ‘look’ it. But Price didn’t care; he accepted himself even if he appeared gaunt under the harsh spotlight. What they did not see was the synthetic, flexible undergarment that allowed his right leg to operate normally, though with a slight limp.

“Cadet Prcic, thank you for the warm introduction. To all assembled here, it is truly an honor and privilege to return to my alma mater. It feels like only yesterday that I was sitting where you are now, clear eyed and hopeful for a career in the military. Now I stand before you as one who has lived a full life in service to his country. I have seen and experienced much. Some bad, but mostly good. The one thing that has kept me going through all the pomp and toil of soldiering is knowledge in my heart that there will always be young...cadets who are willing to commit themselves to something greater than the individual. To the team...”

For a second, Price had almost stumbled into a *nouveau faux pas* and referred to the aspiring service members as men and women. These cadets and many of the guests were children of Millennials or a combination of Generation Z and Alpha. Gender norms had changed significantly in 2018, but even more so in 2021. It was customary to now refer to persons by their job, title, or group to which they belong; in this case *cadets*.

As Price continued his speech, cordite memories stirred in the recesses of his mind and old wounds began to ache. He found himself starting the next sentence, “So there I was...”

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It was the year 2038. Lieutenant Colonel Damien Price looked out across his formation of tanks. He remembered when he was a young lieutenant in 2020. While it seemed like a distant memory, it felt like yesterday with things changing very incrementally over the years—by leaps and bounds in some areas, at a snail’s pace in others.

Captain Manisha Becker strode up to him. She was a recent graduate of the Armored Officer Basic Course. Back in 2016, when they first included women in combat roles, the ratio was less than 10% per class. Now the number of women graduates in combat arms specialties was approximately 45% among officers and about 33% among the enlisted.

Price recalled stories as a young lieutenant from brigade commanders who had a knack for capturing the great changes either eloquently or with the sophisticated use of vulgarity. These warlords would banter about the late 90s for example when an all-male armor force was sacrosanct. Tankers, soldiers, and leaders alike, would debate the challenges of feminine hygiene within the crew compartment while they affixed a new pin-up to the side of the main gun’s breach. These men could not fathom a woman commanding a platoon of four large, armored phalluses to deal death and destruction. They preferred to objectify women, seeking only their conquest and the satisfaction of male urges.

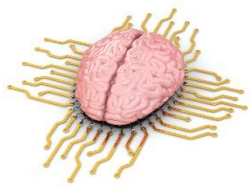
Earlier in the 90s, the field artillery was one of the first combat arms branches to include women, though at a very small number (less than 200) and not in tactical assignments. Those old brigade commanders would also joke at how they would be on the radio doing a NETCALL when the chemical platoon leader would enter the net. In many cases it would be a female voice transmitting, and every one would suddenly tune in.

But after 2010, the tide started to shift. On what was known as Fort Hood back then, a female Bradley commander was ‘top gun’ among the Engineers that were fielded the old M2A3 Bradley Fighting Vehicle. During the wars against terrorism, countless women were also heralded for their bravery and leadership in combat with some earning the Silver Star and other decorations for valor.

Now, in some units, the male voice would be the odd one out. Price had two female company commanders out of five and one transgender. His staff in particular represented a very non-binary grouping of warriors. But it didn’t bother him. The battalion was very effective and had proven themselves in training and in combat. Sometimes he wondered what past commanders would think about the modern soldier and how the gender roles had become indistinct. In part, Price thought the widespread popularity of competitive functional fitness regimens had changed the physicality of women entering the Army, leading to evolutionary change in the system.

By 2022, the population eligible for military service based on physical fitness changed from three in ten, to four in ten. This was the year that Lieutenant General (retired) Mark Hertling’s





national security issue hit home. At a TED talk in 2012, he had made the statement that obesity was becoming a significant threat to security. By 2021, advancements in genomic research and genetic engineering succeeded in varying degrees to stem the obesity epidemic. Unfortunately, advances in health did not correlate to improvements in behavioral health. The military found that mental health issues were not well addressed by overburdened public schools or social services. Many potential recruits had dissociative disorders, depression, or suffered from panic attacks and severe anxiety; screening of mental health at the point of recruitment became a necessity. Genetic engineering only offered a temporary solution to the obesity problems caused by mental health issues, however the Army was able to use new treatments to help recruits get their weight in check to maximize performance.

New generations of soldiers presented a different demographic than previous generations. Price had grown up in a same sex household with two moms. They had taught him that it was important to serve others and to serve the country that was a beacon of freedom to so many others. Not to mention he was part of the derided Generation Z that had gained the ire of Millennials, Generation Xers, and Boomers. Fast forward 18 years, Price now commanded Generation Alpha and some of the newer 'kids' were Beta and in another decade they would be the Gamma Generation.

He did not look forward to the Gammas. The Alphas and Betas were already too engrossed with augmented reality, meta-human enhancements, and virtually all were connected to the ubiquitous Net in some form or fashion. Price feared that he would have nothing in common with the Gammas and felt deep concern for the next generation. It seemed the future could be very bleak, with potentially fewer and fewer binary and non-binary humans eligible for service without significant reprogramming.

*Binary and non-binary*, Price scoffed to himself. In 2020, a segment of society had begun preaching that our notion of humanity was all wrong. We were not biological creatures but binary-logical machines; sentient and programmable entities based on a bio-electric chassis. Simultaneously, artificial intelligence had gained much more sophistication along with nano-tech medicine that lines became more blurred as fanatics leveraged social media to tout their various beliefs and extremism. Price had limited his virtual presence ever since, especially when he started seeing #carbonlivesmatter, #cyberneticislife, and #nonbinaryisnotlogical.

So much had changed, yet there were many important lessons that had not. Price opened his 'green book' thumbing to a page with notes for the next mission. It was 'old school,' he knew it. Some of his peers would tease him about it. But he never needed to plug it in or back it up. In his office, he had a shelf filled with green books he had kept over his time in service.

But the first thing that caught his eye was a poem he had laminated against the inner cover, "The God of Copybook Headings" by Rudyard Kipling. On the first page was also his favorite quote, "Learners inherit the world, while the learned find themselves beautifully equipped to deal with a world that no longer exists," by Eric Hoffer.





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Price snapped back when Captain Becker interrupted his thoughts, “Sir, boresight complete as well as plumb and sync for the company.”

“Thank you,” Price replied automatically, “please link up with Subaltern Ice-Zero Two, I plan to attach them to you on the next gunnery table.”

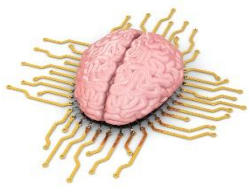
“Sir, WILCO,” Becker acknowledged confidently. The Ices—derived from Artificial Intelligences, AIs or Ices for short—are android meta-officers programmed with advanced artificial intelligence to augment human-led combat teams on the battlefield. Price’s battalion is a testbed for the new technology and will determine the best way to adapt them to company teams in the span of operations across multiple domains. They reminded him of special weapons in retro video games that he played as a child, ones that would tether to his spacecraft as he zoomed around annihilating aliens.

Stepping away from the gunline, Price took a moment to scan the formation of units assembled in the battalion area, each company had a unique brand and composition.

The Longknives were his light infantry they were augmented with all sorts of tech to improve individual endurance, strength, combat and survival skills. Each soldier had nasal implants to decode scent markers and to conduct assessments of their environments. They also used ionic emissions to reduce inhaling particulates and pollution that may affect physical exertion. Additionally, each infantry soldier had advanced audio implants to communicate with and to also detect changes in the environment. The tech actively and passively monitored micro and radio wave emissions around them. Finally, each soldier had visual lenses that could scan visible and invisible light to detect various signatures and changes to the environment. To control and calibrate each system, all the soldier had to do was flick his wrist to activate an electronic wristband that would display controls on the forearm or other surface.

None of this kit was permanent. They were active so long as the soldier’s embedded nanochip remained active in their forearm. The nanochip contained the soldier’s entire record of service to include their medical history and authority to operate enhancements. Once deactivated at the end of service, it would lockout the enhancements. More importantly, if a soldier failed to return the enhancement back to the demobilization site, the enhancement would begin decomposing at the molecular level.

Scanning further along the assembly area, Price saw his favorite unit—he could not help it as he had grown up in the Armored community. The Thunderstix were the heavy combat vehicles comprising tanks and mechs. The tanks were an evolution of the old M1. Lighter and more maneuverable, the new chassis could traverse a wider range of terrain and was also swimmable for short distances. Its armament was a revolution in technology, the fin stabilized sabot now



fired from a railgun which meant each vehicle could hold more rounds of ammunition in the turret. Also with no chemical propellant, the vehicles could withstand a direct hit. The sleeker round also obviated the need for an extended turret design allowing more room within for the crew. One thing that had not changed on the entire vehicle was the M2 .50 caliber machine gun—the last line of defense. In 100 years the M2 had only undergone slight modification and was as reliable as ever. *Some things never change*, Price thought to himself.

Mechs, short for Mechanized Combat Systems, were entirely different from the tank. Thirty years prior, a competition between a Japanese and an American company gave birth to the Mech revolution. Unlike the tank, a Mech had two operators instead of four. It was more like an Apache helicopter without the rotors mounted on a gyro-stabilized chassis with a triangular tread configuration. This was the first version, other versions under development included types that could transform from a humanoid form to an aircraft. Science fiction made real.

Price returned to his command tent. The smell of diesel was not as strong as he once remembered it, but the dust—it took him back to simpler times. Perhaps, this was the same dust carried across continents by the Army as it marched to the sound of guns, conquest, freedom, or security.

Inside the tent, he checked to make sure the active/passive electromagnetic and electro-encephalometric protection systems were operational. China had been the first to test electro-encephalometric jamming by disrupting beta waves at 14-40Hz. One reported test produced catatonic seizures among unshielded test subjects that lasted 3 hours; enough time to penetrate an integrated defense or severely disrupt command and control. In a separate Russian test, meddling with brainwaves produced heightened awareness that suggested clairvoyance and extra sensory projection. While recent unconfirmed, reports indicated compromise of sensitive information, nothing conclusive ever tied the data breach to the Russian tests.

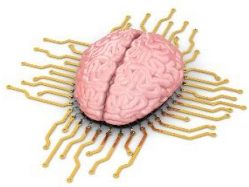
“Excuse me sir!” It was Major Riley Vance, a non-binary who had risen through the ranks and was up for promotion.

“XO, what is it?”

“Received word that our launch window for the Enders moved up. Brigade is going to have a virtual meeting in an hour to determine the impact on the mission.”

“Very well, we’ll holo-cast into it, make sure we have an updated risk assessment.”

“Sir, the conference holo-cast is down, we can only use the VR-suite or the deskside holo-cast in your quarters. Captain Musisi is working on the risk assessment to determine how it will affect future meetings with brigade. At this time we assess low risk due to the backup systems.”



Enders, holo-casts, VR-suites...Price drifted for a moment as Vance droned on in the background. The Enders had emerged as a mad-scientist idea to solve the population and resource crisis of 2033 but the program was still in its infancy. Politicians hoped to build an expeditionary force to start learning the lessons for space war and to support the long term—like 500 years—plan to colonize Kepler 168. *How typical, when life becomes difficult, we try to find a way out.* In this case, *out* was off-world. “Mars First!” was the motto strung tirelessly through the news outlets and on various social media sites as conglomerations, commonwealths, and meta-states entered the race to become the first to colonize Mars. It was the drumbeat during the last presidential election and echoed long after.

For the Crusader Battalion, Price had the luck to train a company of Enders. Each of the eight Army divisions had to task a battalion to train Enders in addition to their normal warfighting tasks. For Price and the Crusaders, it had been uneventful—except for the quarantine episode. But that was behind them now, the only thing left was launch training. The intent of the Ender project was to create the baseline for the development of terracolonyes and starbases as well as the security forces that would protect them. Security forces became popular as the country recoiled from a series of crises and unpopular wars abroad.

Suddenly, an alert message flashed across his eyes. *Troops in Contact!* One of his deployed light infantry companies was in a firefight. They had deployed in support of Operation GOOSEBELLY to the Republic of Arizona to assist with border security. Price walked over to the holo-caster. Instantly, on the other end a small drone activated and hovered at what would have been eye level for him. It paired with a small ground rover that created a hologram of him. In tandem, the two moved to the company commander’s location.

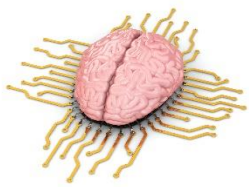
Captain Julian Piggot took cover behind a modified HESCO type XVI barricade. A few bullets zinged by and through the moving hologram of Price. “What is the situation report?”

“Contact two snipers, they engaged us as we were assembled in the motorpool to conduct our pre-combat checks and inspections. Second platoon has their location pinpointed using our acoustic sensors, we’re getting ready for a smart missile but the collateral damage assessment is not complete.”

“Very well,” Price replied calmly, “Keep me informed if the situation changes.”

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Half a world away, Lieutenant Cadence Riley bemoaned her assignment to the Enders. *End of the world, more like it*, she thought. Her company team was composed of one light infantry platoon, one engineer platoon, and a light armor platoon that was hers. They had trained diligently for the mission to Mars. Platoon situational training exercises, company team STX, and gunnery. The problem with gunnery was that the scientists could not wholly replicate conditions on the Red Planet to finalize the ballistic solution for the main gun system. The current solution was theoretical.



Earlier Mars missions prioritized terraforming efforts and infrastructure build over ballistics testing. The earthbound defense contractors did their best to simulate Mars conditions in VR and by using pressure chambers. While their math worked at shorter distances, they could not guarantee complete accuracy at the ranges the tankers were accustomed to, 5-8 kilometers were normal for standard gunnery tables. Simulations suggested that the calculations would work, but still there was a chance for human error and financial biases. The contract companies presumed that the thinner atmosphere and lesser gravity on Mars would reduce the friction coefficient on the fin stabilized sabot round and potentially increase the distance and lethality of the main gun. However, without testing, they could not refine some of the targeting solution—especially on the move. Not to mention, in some areas, the terraforming efforts had altered the atmosphere to make it denser.

The other issue that they could not anticipate was the obscuration caused by the fine Martian dust. It was bad enough on a hot day in Texas, but on Mars the obscuration would no doubt linger longer and even give away one's defensive positions.

To compensate for the presumed deficiencies in the main gun, the contractors created high power laser systems for some of Riley's vehicles and guided missile pods on others. The lasers would have no energy loss in the atmosphere and be effective against light infantry while the laser guided missiles would deliver a high explosive shaped charge to defeat most enemy armor and some structures. The deployment of geosynchronous satellites in orbit around Mars had been delayed preventing the necessary global positioning accuracy that most were accustomed to on earth. Laser designation would come from drones that would lift off from the top of each armored vehicle.

"Don't worry about it so much LT," said Riley's Platoon Sergeant. Sergeant First Class Magnus Erikson carried himself with a confidence beyond his years. Seven promotions in seven years, he had distinguished himself from his peers by always taking and excelling at the hard jobs. This assignment was a nominative position and he was eager to go.

"Easy for you to say," Riley retorted, "can't you see this mantle of command that's resting oppressively on my shoulders?" she said gesturing with her hands as if some giant gorilla were sitting astride her neck.

It wasn't going to be easy. The trip itself would take approximately 215 days base on the best projections for this time of year. But they could not wait for a better window. The Russian Confederation had already deployed a military mission ahead of schedule. They would be in place before Riley's platoon and the rest of the company would arrive. *The Ruskies would be acclimatized and their weapons zeroed* weighed on Riley's mind. She had left her brainwave modulator back at her tent; a device made of flexible nano-tech that fit comfortably around one's crown and helped modulate brainwaves to improve concentration and reduce stress.



*Ruskies, sounded like the Cold War from the history books.* Riley picked up her olive colored tablet and started scrolling absent mindedly through the mission details. Her mind was preoccupied with other thoughts. Her platoon would spend almost a year in space, just to get to into geosynchronous orbit. Then it would be about 30 days to prepare for the descent on specially designed landers. Another two to three weeks just to get their equipment unpacked along with two weeks of Martian gunnery. *If all went according to plan.*

No one really knew what the Russians had sent. Intelligence assessed light infantry with long range air defense. No doubt their plan would be to disrupt United Nation plans to expand the foothold established. Riley decided to focus only on the things she could control at the moment. She reviewed the dossiers of her subordinate leaders. They had been selected after intense psychological screening because the mission would be very strenuous, more strenuous than many of her peers would expect and more difficult than her family would ever know. In its entirety, the mission would last approximately five years with no furlough or leave back to earth. Her platoon would only return when relieved by others. In the meantime, they would exist at the American Martian Colony subsisting on the locally grown produce and cargo delivered by railgun from the Moon Supply Point. The only thing she could compare it to was the British military during the era of Pax Britannica, and she had dedicated time to understanding history to put this mission into the proper context—not just for herself but for her soldiers.

Riley couldn't help but think that maybe the quiet apprehension throbbing at her temples was a human trait from time immemorial. She couldn't trace her family heritage, it was too mottled, but she imagined SFC Erikson could. She imagined Erikson's ancestors standing at the prow of a Viking longboat cutting its way westward through the ocean to Lindisfarne. Over centuries of human development, the drive has always taken warriors to distant lands for gain, gold, glory, or god.

She stepped out on to view the launch platform from her small temporary headquarters near the mission ground station at Sriharikota—just north of Chennai, India. The small island was a veritable spaceport with frequent missions to the moon and orbiting multinational space stations. Mars was its magnum opus, the first mission to Mars launched from the Satish Dhawan Spaceport, two weeks ahead of the combined US, Korea and Japan mission. It had been a blow to American pride which had struggled through the early part of the 21<sup>st</sup> century. Now, foreign college students returned home to begin projects to revitalize their countries. Nationalism spread throughout much of what scholars had once termed the developing world, but more significant were the shifting of alliances and the building of new ones.

In the last decade, countries like Azerbaijan, Kazakhstan, Indonesia, Thailand, and the Philippines had become leaders in the space industry. While India maintained the largest investment in space based technology products on a global scale, closely followed by China, Russia, and the US, each of the other countries worked as part of a larger conglomerate to share resources alongside India and with China. Whereas Europe had sweeping influence





during the age of exploration centuries ago, space was anyone's game and an astronaut would more likely find an Asian food stall at one of the Mars mission sites than a burger joint.

Even African countries were in the game. Buoyed by investments by India, the Commonwealth of China and the European Union, there were support and logistics nodes in Africa to support space exploration as well as some newer spaceports under construction.

A terminal beeped inside Riley's command tent. Due to the remote location and narrow bandwidth offered by the host nation, Riley only had voice over internet protocol with an older version web camera. It was enough to relay information back to her battalion and her computer could package the data very efficiently. She only had technical issues when it required both voice and video. *It was the battalion commander, probably looking for an update.*

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"And so in conclusion," Price said, "I have learned that somethings will never change, at least not so drastically as to become unrecognizable. However, I have also learned that science fiction writers, theorists, and innovators will always be ahead of our military force. It was true when cyberspace became a warfighting domain in 2010, thirty years after it first made its debut in print. We can only hope that we empower our best and brightest to lead us into the next decade—not necessarily to destroy our enemies, but to compete and safeguard our future. At the end of the day, the answer to everything is 42. Thank you, it has been a pleasure to speak before you and share my experiences. Our memories of cordite, sinew, and steel will forever shape our destinies."

Price returned to his seat amid a rousing applause. But the true reward of the evening was the look of hope in the eyes of the cadets present.



Yukio Kuniyuki is an aspiring science fiction writer who hopes to one day find his name on the spine of at least one book or available through a self-publishing website—alongside many other authors who served in the military. In the meantime, he spends most of his time writing in an active style regarding mundane topics such as tactical signals intelligence operations, leadership, or comparing information collection to ghost hunting.

Yuki (no, his name does not mean 'snow' in Japanese) spent his formative years growing up in Dar Es Salaam, Tanzania; Stockholm, Sweden; and Singapore. Eventually he found his way to Florida where he finished high school and discovered a deep interest in

science fiction and fantasy.



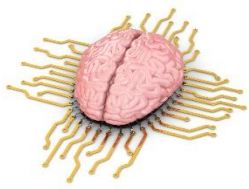


Science Fiction:  
Visioning the Future of Warfare 2030-2050  
U.S. Army TRADOC Mad Scientist Initiative



In 1998, He graduated from the University of Michigan with a Bachelor's of Arts in Mandarin having also studied Japanese, French and Arabic. He entered the Army as an Armor Officer branch-detailed from the Military Intelligence (MI) Corps; this helped nurture his affinity for science fiction and fantasy. He served as a Tank Platoon Leader in 3<sup>rd</sup> Battalion, 8<sup>th</sup> Cavalry Regiment—where he would marvel at the night sky through his cupola--and then worked as the Assistant Brigade S4 and Assistant Brigade S2 for 3<sup>rd</sup> Brigade, 1CAV, Fort Hood, TX—spending a couple rotations on the Martian landscape of the Mojave Desert. Some of his favorite smells in the field are diesel exhaust, cordite, and powdered dirt. Yuki spent two years in Korea as the Battalion S2 for 1<sup>st</sup> Battalion, 72<sup>nd</sup> Tank Regiment, 2ID, and then spent a third year as Company Commander for A Company (MI), 1<sup>st</sup> Brigade Special Troops Brigade, 2ID.

Following Korea, Yuki attended the National Systems Development Program (NSDP) at Fort Meade, MD. From 2007-2009, he served as the Division Collection Manager and Division Intelligence Planner for 4ID and deployed during Operation Iraqi Freedom 08-09. In 2009, Yuki received an assignment to Fort Huachuca, AZ where he served as a Program Manager in the Intelligence Battle Lab followed by an assignment as the Division Chief for Electronic Warfare and Cyberspace Operations. He concluded his time at Fort Huachuca as the Battalion S3 and Battalion XO for the 304<sup>th</sup> MI Battalion responsible for the training of all officers and warrant officers in the MI Corps from 2010-2012. He then received an assignment to 10<sup>th</sup> Regional Support Group, Okinawa as the Group S2 in June 2012 and then served as the Group S3 and the Group XO. He is currently the Battalion Commander for 344<sup>th</sup> Military Intelligence Battalion, Goodfellow Air Force Base, San Angelo, Texas. He feels his current assignment gave him the motivation to finally complete his first essay for the TRADOC G-2 Mad Scientist competition because Gene Roddenberry once trained as a pilot at Goodfellow AFB. Yuki is married and has three boys along with two dogs. His family has also been a major inspiration for him in writing and exploring his imagination. Somewhere in Hawaii, his doppelganger leads the Intelligence Warfighting Function in support of Tropic Lightning.



**Beginning Morning Nautical Twilight**  
**By Matthew J. Keating**

The all-hell which broke loose over the past half hour was diminishing. Captain Garcia looked out from the roadside ditch into which he and his soldiers had scrambled when the shooting started. Three trucks surrounded a small, partially-collapsed building half a click out and were tearing it to pieces with sustained barrages of their heavy machine guns, sirens wailing and horns blaring. Two trucks were on fire and spewing pillars of black smoke, their ammo stores cooking-off with bright red flames and staccato reports. He looked at his soldiers and they looked at him, eyes wide.

Like a wave, reality caught up with him and, pointing to the road behind them, he shouted "Go see to him and call a medevac in now!"

He pulled his own radio from its pouch and called his operations center, "This is Apache 6, we have been ambushed. I need a recovery mission. Give it to 2<sup>nd</sup> Platoon, tell Lieutenant Adams to bring all his Dumbos and six tow sets, and tell him to be armed to the teeth."

Garcia looked out across the desert. He knew there was a drone circling above and he wondered if it recorded accurately what he just witnessed.

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The Army colonel looked through a one-way mirror into the interrogation room. It had been a long series of flights, commercial and military, to arrive here at the main logistics base. He had travelled the whole way with the civilian from the factory, faking interest in his stories of corporate deals and politics. The technical specialist on his team, Chief Warrant Officer Kelly, came out ahead and had been here for two days, seeing what she could sniff out.

On the other side of the glass in a sparsely furnished room, an Army captain sat at a table. Dressed in faded battle camouflage, he had the rough edges and wind-burned look of one who had spent some time in the desert. His complexion was callow, like the greyish tan dust that covered this base, and he had dark circles under his eyes. He raised a water bottle to his lips, his hand shaking.

The captain stood and turned as the visitors entered the room, an intelligence colonel, too young and too clean, a female warrant officer and an obviously out-of-place civilian. "Captain Garcia, I am Colonel Cook and these are my associates, Chief Kelly and Mr. Selby. We are here from D.C. to talk with you about the events which occurred on your convoy operation this week."



As the visitors took seats around him, Garcia nervously stared at them for a moment and replied, “Ok, sir, I can certainly tell you what happened, but I am still struggling with the how and why.”

“Let’s just start with your unit and mission” said Jones. “What is your role here?”

Garcia took a breath and began. “I am the commander of Alpha, 330<sup>th</sup>; we are a Transportation Company. I have fifty personnel and forty Dumbos.”

“Dumbos?” Jones asked.

“Sorry sir, that’s our nickname for the Defense Mobility Carryalls, our trucks. From a distance you could imagine they look like an elephant, sort of. When we convoy, the First Sergeant said they reminded her of ‘elephants on parade’ and the name stuck.”

“The Dumbos are semi-autonomous and use leader-follower programming. They’re lightly armored, with a titanium passenger-pod in the center. On convoy, only one truck is manned and it controls the whole mission, three soldiers can run a convoy of up to five trucks. For security, we alternate the position of the control truck in the line, and all the Dumbos look pretty much alike.”

“They have full-up sensor packages, GPS with block-chain positioning as a backup, night vision, audio, video, thermal...the works, so the control truck can be anywhere in the convoy. They’re all networked together and share information between themselves and the manned truck.”

Garcia continued, “Our area of responsibility is the southern half of the country. Our mission is to run supply convoys out to all the Forward Operating Bases. We carry anything and everything, ammo, food, water, fuel, even US mail. We go everywhere and run missions every day, it never stops.”

Jones touched his tablet and said, “The reports here say that your unit has one of the highest mission readiness ratings ever achieved while deployed, so you must run a very effective team. I have read though the after-action report from a few days ago and it says that your unit engaged an enemy force of about twenty, all killed in action and that you lost one soldier and no wounded, is that correct?”

“Yes, sir” Garcia replied.

Tell us about what you face day to day, what is it like?” Jones asked.

“It’s pretty crazy out there, Sir. We get shot at almost every mission. Small arms fire just pings off the armor but sometimes we take some heavier damage. The Dumbos have advanced turret-mounted M-240 and .50 caliber machineguns and we control all the guns simultaneously from the manned truck. Our convoys have serious firepower and are in constant



communication, so if we need fire or air support, we can get it. We've only had one casualty in our eight months here; this week....that's when all this happened."

Jones looked at him for a moment and asked, "All what happened?"

Garcia was silent, the whole room was silent. Garcia took a sip of water and began. "Sir, you mentioned our readiness rate. We have a good team here. My motor pool troops are first rate; 'death's head mechanics' as the joke goes. We know our jobs, our equipment is good and we're all focused on doing our best and in four months, rotating out of here. But we also have, I guess had is the more appropriate way to put it, something special.

"There was this guy, Specialist Daniel Patrick Murphy, everyone called him Pat. He was National Guard, a mechanic from Tennessee, here on mobilization. He was a strange bird, sir, really odd. I did not talk with him much, because it was really frustrating to. Some of the NCOs said he farmed Christmas trees, others said he raised pigs on some tumbledown patch in the backwoods somewhere.

"Active duty tours were good money for him and he was here when I got here. His records said he had extended, maybe more than once. He was almost twice my age and only made E-4; never went to NCO schools and never sought promotion. He was happiest doing what he did best, fixing trucks. He said that he loved deployments, "Three hots and a cot and all the money I got", he was weird like that, rhyming words.

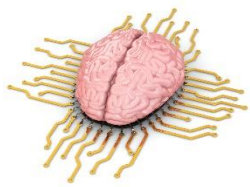
Garcia continued, "Pat, I mean Specialist Murphy, did not interact with people all that well. I said it was frustrating to talk to him; that is because he was in his own little world. If you asked him what the date was, he would tell you in Egyptian...ancient Egyptian, somebody looked the words up. The rest of the company treated him ok, a few pranks here and there, but Murphy just took it in stride.

"My predecessor told me to hold on to him if I could, he was the best mechanic he had ever seen, despite the quirks. You know how it is with soldiers, sir, some develop and grow into leaders, some just find their niche and dig in and make a life there. Murphy was like that, he just wanted to fix machines, any machine, but especially the Dumbos.

"After a while, the motor pool guys became really protective of him. He would eat chow with all of us at the DFAC and always stopped by the leader's tables to chat. He would tell us about the trucks he was working on and what he had to do, but topics other than that got really strange. We learned quickly to ignore his oddness, because he was the reason our readiness was so high."

Garcia paused to sip more water and Jones, tapping his tablet asked, "One odd-ball specialist was the secret sauce for a 98 percent mission-capable rate?"

Garcia nodded "He knew the Dumbos, inside and out, he...named them,... each and every truck. He started with dog's names, like Spot, Rover, Hunter. When he ran out of those he



used mythological names too. Every truck had a name. We used to test him, someone made a matrix of tail numbers and names and he never failed, not once. The company started using the truck names, I admit, I did too. He showed the mechanics stuff about Dumbos that they never knew and some of my folks even trained at the factory where they are built. The motor pool was in awe of him I guess you could say; that is why they became so protective. Soldiers are superstitious, especially in combat; Murphy was like a good luck charm.

“He moved his cot down there and set up a hooch in a shipping container so he could work all day and night on the trucks. He only broke for meals and an occasional PX visit. If a truck came in with a bullet ding on the side, he would have it repaired and repainted by the next morning’s mission. He loved those trucks, and some of my soldiers think, well, that the trucks loved him back.”

Cook pushed back in his chair and looked at Kelly and Selby and then back to Garcia “What do you mean by that, captain?”

Garcia took another sip of water and swallowed, his hand visibly shaking. “Some of the troops said the Dumbos loved Pat, Specialist Murphy, loved him like a dog loves his master. It started about two months in to our deployment. One of my maintenance NCOs brought Murphy to my office and he asked if he could make some changes to the diagnostics subroutines we use in the shop, use system dynamics to put in feedback loops, virtuous-circles, goals reinforcement and so forth, a lot of tech-sounding stuff.

Garcia went on, “I’m pretty up-to-date on Carryalls. I went through the maintenance course at Fort Lee. I’m licensed to operate them and I’ve gotten down and dirty fixing them. I even visited the factory, but he lost me on exactly what he wanted to do. He said it would improve turnaround time and make the shop more efficient. I said fine, go ahead, but make sure we have the default backups secured in case it does not work.”

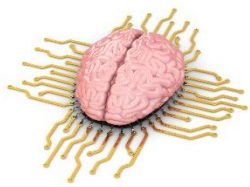
At this, the civilian, Selby interrupted, “Captain, you know you are not authorized to change Carryall programming or diagnostics.”

Garcia looked tensely at him for a moment and turned to Colonel Cook and asked, “Who is this guy?”

Cook said, “Mr. Selby is the contractor representative from Defense Mobility; he works at the factory in Michigan.”

Garcia stared at him and said, “There aren’t people shooting at you and trying to blow you up every day in Michigan.”

Cook intervened, “OK, gentlemen, enough. Captain, continue with what you were saying.”



Garcia resumed, "It really doesn't matter, the Carryalls are all set to default baseline when we bring them back to the US, anyway. It was diagnostic and maintenance programming, not the control logic...at least that is what we thought. Murphy bought a VR headset and gloves at the PX and used that to link into the maintenance computer at the shop. He streamlined everything and it was working very well, better than I expected. Our readiness rate went from seventy-five to eighty-five percent almost immediately.

"Murphy added some hardware to the Dumbos, whistles, beepers, sirens and other stuff. It was weird, at first. Murphy would meet each returning convoy at the motor pool gate, wearing his VR headset and gloves, and each truck would whistle and beep at him as it went by. Diagnostic reports, he told us. Each truck was telling him what it needed. Some of the troops were unnerved, but it worked and our readiness stayed high and even climbed higher. At first only Murphy could understand the beeps and whistles, I guess it was a language he invented. As time went on, the other mechanics came to understand some, too.

"Over two months, we'd installed Murphy's diagnostic improvements on all the Dumbos. One day, as a convoy came back in, one of the mechanics was at the gate with Murphy. Each truck gave its beeps and whistles as it came by and the mechanic could recognize the signals for routine stuff like fuel, tire pressure, oil, but there was a curious pattern preceding them. The mechanic asked about that and Murphy, wearing his VR goggles and waving his gloved hands turned and said "That's me; they are saying hello to me." He reported this up the chain and it came to my attention. I had to see for myself.

"When that day's convoys came in, I too was at the gate and heard the beeps and whistles. I asked Murphy about the greeting.

"He laughed "Yes, sir, they know me because I take care of them. Murphy said "Hey sir, watch this" and spoke directly to the approaching Dumbo "Thor, wash racks first, then fuel, then shop". The big truck passed them and turned right towards the wash racks.

"I could not believe what I was seeing and asked him, 'Murphy, are you going to tell me they understand voice commands?"

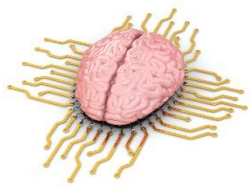
"Murphy turned, laughed and said "That was an easy fix, sir. I just tied in the audio from the sensor pack."

"Tied it in to what, Pat? These trucks do not have voice command; that is something they have been promising us for years."

Murphy giggled "Sir, it was no big deal, I upgraded the maintenance server and made it real". He turned back towards the next oncoming truck and said "Daisy, refuel first, then wash racks, then shop."

Garcia said, "I watched the Dumbo...'Daisy' pass me, lock left wheels, pivot and start towards the fuel point. The truck emitted a whistle like a Navy bosons whistle as it passed by."





“That’s you, sir” Murphy said, laughing. “She’s greeting you.”

Garcia continued, “I asked Murphy how the truck knew it was me?”

Murphy just laughed and said, “They all know you, you are the boss around here; how do you like that?”

“I went immediately up to the motor pool and found Chief Schwartz, my maintenance warrant. “Chief, tell me I’m not going crazy...I just watched Pat tell the incoming Dumbos where to go and one of them whistled at me as it went by.”

The maintenance officer laughed and said “Yes, and they also email their status reports now; we do not have to download them off each truck. That saves us a ton of time and they all come in to the shop clean and fueled up; Murphy is a genius.”

“I said, ‘Chief....they can’t do that. How do they do that?’”

Schwartz chuckled and said “Captain, you know the Carryall has a pattern-learning capability; it will learn the routes that it takes repeatedly. They also monitor changes, like a filled-in pothole that was not there last trip. All of this is meant to decrease operator workload, so they can focus on security and mission.”

The maintenance officer continued, “Pat just tied in the audio and camera sensors and beefed up all of these capabilities with some maintenance server programming patches. I for one like it. It really streamlines our work here in the shop. C’mon sir, you’ve seen our readiness reports, right?”

“I told him, ‘Chief, after dinner tonight you come up to my office, I need to know all the things you guys have done to these trucks...all of it.”

Colonel Cook said, “Captain Garcia, why don’t we take an intermission here. Go get yourself some air. Mr. Selby, why don’t you go with him? Let’s reconvene in fifteen minutes. Chief Kelly, hang back for a bit, I want to ask you something.”

Selby said, “That’s a good idea Colonel. Captain, my apologies, I should not have shot my mouth off back then. I did not appreciate all the pressure you deal with out here, and now this.”

Garcia nodded, got up and went towards the door, Selby following.

When they had left Cook said to Kelly, “Selby is sniffing opportunity. He has an idea of what went on and figures if Garcia emerges from this intact, which I expect he will, that he will someday become Selby’s new rain-maker in Transportation Corps.”

Cook looked directly at Kelly and asked, “So what does CYBERCOM think happened here, the birth of artificial intelligence?”



She laughed and said, “Kind of looks that way, doesn’t it? Though I would not yet make the leap to full AI; pieces of it, maybe; an emergent capability, maybe. There are two types of AI, weak and strong. Weak AI is task-oriented, and non-sentient, a sort of brute force approach, like the chess computers some years ago. They succeeded because they could crunch through hundreds of thousands of potential moves in microseconds.

She continued, “Strong AI on the other hand, is a sentient machine, aware of its own ‘self’ and exhibiting recursive self-improvement. It finds and fixes its own inefficiencies, rewrites its own programs based on goals it sets for itself. I am not sure we are there with these trucks, but we may be close.

Kelly went on, “When I got here I linked up with some Fort Meade folks I know. I got the First Sergeant to help, had her sign a Non-Disclosure form, swore her to secrecy, all that. I went over to the motor pool and inspected the shop computers and Murphy’s hooch.

“He has something...a patchwork of laptops and arrays of virtual reality game processors filling the back wall of his hooch. All of which is cabled into the motor pool maintenance server. I did not touch it, it’s still running. The unit is still doing convoys, though the trucks from the ambush are powered down and locked up in a separate area of the yard.”

Cook said, “I assume you have viewed the predator video of the ambush and what happened after.”

Kelly replied, “I watched it about two dozen times, at various speeds, infrared, UV, false-colored and we ran it through our analysis systems at Meade. It shows exactly what he said; his unit engaged and defeated a platoon-sized attacking force.”

Cook shook his head and asked, “Chief, you know where I am going with this?”

Kelly paused, smiled and replied, “I can count, colonel. Garcia’s report said he, an NCO and Murphy took three Dumbos, I mean Carryalls, out to assist 1<sup>st</sup> platoon’s convoy, also a three-pack, where one truck was hit by a standoff mine. So Garcia plus two soldiers, and there were three with 1<sup>st</sup> Platoon, that’s six. On the video you see all of them were out of their trucks and on the road. One of Garcia’s men was hit, Murphy from the report, when the action started. During the fighting, the pred feed shows one casualty on the road and five men in the ditch.”

Cook nodded, “So, when the trucks engaged the enemy, who was the human-in-the-loop?”

Chief Kelly looked closely at him, sighed and said, “Yeah, there’s that.”

Kelly changed the subject, “I wish I could have met Murphy. We have a few like him at Meade. You could say they are savants, in a way. No people skills, but wow, are they good with systems and programming.” DOD filters for these skills, and every now and then we find a real



pearl among the oysters. I liked what Garcia said about people finding their niche. I guess I'm like that. The Army lets me play around with some of the most advanced machines on the planet, and I also get to play a lot of golf."

Cook said, "I know you have a doctorate in computer science from Hopkins, kind of unusual for a warrant officer."

"Part of the package" Kelly replied. "I have a whole list of headhunters always eager to talk to me, but for now, I'm lovin'....this." she said, waving her hand around.

She continued, "Back to the issue at hand, I have a hypothesis. The control logic and server are supposed to be isolated and tamper-proof, ask Selby, if you want. But, I think the key is the maintenance server and embedded maintenance computers on the trucks. The control server, by necessity, is linked into the maintenance server. Vehicle health stats are crucial for operations.

"Murphy's cobbled-together thing is also linked into the maintenance server. I think we have a cascade arrangement here, a hybrid neural network. It's almost like a human brain, different parts do different things. Murphy somehow found a way to knit them together with his software patches."

Cook countered, "Three server boxes does not a brain make, and how can a farmer who lives in a trailer in Tennessee write AI software that nobody in the entire military-industrial complex has been able to come up with?"

Kelly replied, "Sometimes real talent gets you farther than training. We pulled his web traffic going back eight months and he was farming out bits and pieces of the program patches to a number of small VR gamer hack-shops. The rest, I guess, is self-taught; everyone is saying he is a genius with machines. Programming may be just an aspect of that. As to the brain analogy, it's just my guess here in the field. Call it intuition. The part of this brain-system we don't have any longer is Murphy. Maybe he was the cortex, the thinking part."

"So how do you explain the counterattack by the trucks, if Murphy was down?" Cook asked.

"Not sure", Kelly replied. "Instinct? Fight or flight? The big question is will the system continue to function without Murphy? Maybe Garcia is the key since it apparently knows him."

"This just gets better and better" Cook said.

There was a knock and the door opened and Garcia and Selby came back in and took their seats. "Ready to resume?" Cook asked.

Garcia nodded. Cook said, "Let's go over the day of the convoy. I want you to know that I have viewed the drone feeds, so tell it straight, ok? I also want you to know that nothing will leave this room. Selby is cleared for this."



Garcia started, “We had one convoy on the road that morning, 1<sup>st</sup> Platoon, three trucks, control truck was number two. They were about a half hour out when the lead truck was hit with a standoff mine, a platter charge. Truck one was down, severe damage. The other two went on defense and called back to the ops center. They were not taking any fire so I told them to hang tight and that a recovery mission was on the way.”

“I wanted to see for myself, so I told the First Sergeant to get me a three-truck convoy and an assistant driver. I called Brigade and requested a recon drone mission. When I got to the motor pool, my NCO was waiting for me with three Dumbos. I rounded up Murphy and told him what was going down. He was a bit agitated and I told him to get his weapon and gear. Honestly, I think this was the first time he was outside of the wire.

“We rolled up on 1<sup>st</sup> Platoon’s vehicles and I pinged them for the security situation; ‘nothing happening’ was the reply. We pulled in behind, maintaining spacing. I popped our pod door and the three of us went forward. 1<sup>st</sup> Platoon’s folks did the same and we met at the damaged truck. It had a hole clear through the superstructure and the shot had sheared off the front axle, so it was almost on its side. It was whistling and beeping as we came up on it.

“Murphy went right to the truck and said, “Oh Lord, I have to help him”. He took off his pack and pulled out that VR stuff he uses. He took off his helmet to put on the goggles.

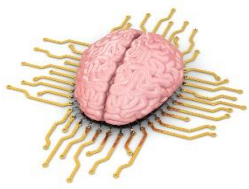
I yelled at him, “Pat, don’t do that! Don’t take off your helmet!” I lunged to pull him back behind the Dumbo where there was some cover. One shot rang out, a sniper. Murphy went down immediately. Then we started taking lots of small arms fire. It was like one of those moments when everything goes into slow motion. We all dove into a ditch at the side of the road. I hate it that we just left Murphy, lying there on the road.

“Then the first truck in line starts up its siren; then the next and the next, then all of them. The pod doors on the two command trucks closed up by themselves and the five Dumbos pivoted right simultaneously. All the guns tracked forward and opened up, the damaged truck, too. They are not supposed to do that, right? That can’t happen?” Garcia looked at Cook, then Kelly, then Selby.

The three visitors were uncomfortably silent.

Garcia swallowed and continued, “The trucks took off across the open desert, sirens wailing, horns blaring and all guns firing. They were in camouflaged spider holes, sir; the enemy. They were waiting for the recovery mission, waiting for us, waiting for me.

“I saw the trucks fan out like spreading your fingers, each heading to where the fire was coming from. One enemy shot off an RPG. It hit dead on, sir, but the truck did not stop. It was on fire and it did not stop. It ran them down, crushed them. Some enemy popped out of their holes and took off, with trucks in pursuit, chasing them down like bull elephants.



Garcia went on, "Another truck took an RPG, same thing, no effect, now they had a burning truck chasing them. They all broke and ran at that point. The trucks' gunfire was effective. Only four enemy made it to an old mud-brick building about a half-klick out. The three remaining trucks surrounded it and just tore it up with their guns."

"That was pretty much the end of it" Garcia said. "We counted twenty enemy dead, all badly messed up, either by gunfire or the truck wheels. Dumbos don't take prisoners, sir."

Cook pushed his chair back. "Okay, Captain Garcia" he said. "Here is what I think is going to happen. Alpha Company will complete its mission. You will finish a very successful command, with the highest readiness rating ever and a successful combat op. The official record will show you popped the pod on the damaged Dumbo, err...Carryall, and directed the battle from there. There has to be a human in the loop, Captain and, officially,...that was you."

"When you get back to the states, you are going to have a new assignment, at TARDEC, the Tank Automotive Research and Development Engineering Command in Michigan, so you will get to know Mr. Selby pretty well and I expect you will also spend a lot of time with Chief Kelly."

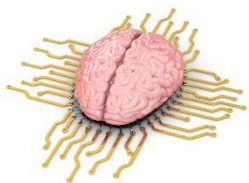
Cook continued "We need to keep the trucks linked to the system, so that means running convoys. We cannot afford to turn it off, because we don't know if we can start it up again. When your relief arrives you will take the entire system, still running, along with one truck, back to Michigan by C-17, I will arrange that. The rest of the trucks will come later and I hope we can re-synch them. The system seems to know you, so you are a critical piece of this whole project."

Cook paused and looked at Garcia. "Are we good, Captain?"

"Yes, sir" Garcia said with evident relief, "We are very good."

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A C-17 sat, engines idling, at the airfield. Passengers rotating out were aboard and waited in silence for one more. From the edge of the base a cloud of dust rose. It resolved into a convoy of thirty-nine towering grey shapes, the ubiquitous Carryall trucks that kept everyone in beans and bullets. The convoy proceeded across the taxiway and split into two files, one on each side of the massive plane's cargo door. They stopped, and with a precision movement, pivoted on their huge wheels and faced in. The passenger pod doors popped, one soldier emerged and stood at attention in front of each truck. From the last vehicle, a column of soldiers carried a flag-draped casket. As the casket reached the plane's cargo door, thirty-nine sirens began to wail.

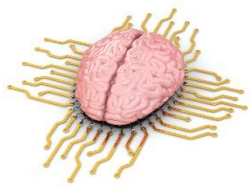


Science Fiction:  
Visioning the Future of Warfare 2030-2050  
U.S. Army TRADOC Mad Scientist Initiative



Matthew J. Keating is a retired Army Reserve officer currently working in the aerospace industry. He is a graduate of Penn State University, the U.S. Army War College and the University of Pennsylvania. He is intensely interested in workplace automation and its effects, robotics and artificial intelligence. He lives outside Philadelphia, PA with his wife and their son is currently serving in the U.S. Army.





## DONOVIAN DROP

By Justin C. Kirkwood & The Staff of Design Interactive, Inc.

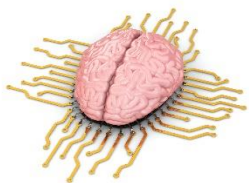
The ambient prattle of the platoon fell silent as a Donovan natty stepped into the command center. 1st Lieutenant Anora Malkin walked behind him, guiding him, her small frame hidden for a moment behind his immense shadow. His unnaturally imposing physique and iridescent eyes immediately gave him away as a DN Atty - enhanced genetically, but lacking any implants or exocortical interfaces. Access to natties, or biopristine operators, was key to the formation of the Collective Western Strike Force. Bioethical guidelines prevented the US from making genetic alterations to its population, however, Donovanian science was far less constrained.

"Everyone, meet Sergeant Petru Cuza," announced Lt Malkin. "He's our ground operator for this mission. As you all know, FOG fighters are embedded among the civilian population below. They're gonna have to be manually tagged one at a time before we can neutralize, so keep your hands clear of the engage command until you get the green light. Understood?"

A collective "Yes, sir!" rang out.

Each Fist of God mission was unique. The jihadist group had already become a formidable threat when they, like everyone else in the world, gained access to the Army's leaked tactical simulation library. With merely a cheap, off-the-shelf HMD and a StimSuit, FOG could turn an idle slum-dweller into a seasoned fighter within weeks. After the recruitment of an unscrupulous MIT Neurotechnology professor, FOG's capabilities grew exponentially. They used barbaric surgeries to create a small army of neuro-enhanced hackers who outpaced Allied capabilities at every turn. The altered hackers who managed not to succumb to horrifically fatal seizures or insanity created FOG's crowning achievement - an emanation field that quickly compromised any technological devices in its 1,000-meter range. Allied drones and other weapons entering the zone were turned against their operators, or even more effectively, turned on nearby civilians for propaganda purposes.

The CSWF was primarily formed so the US could utilize Donovia's own force of biopristine soldiers to penetrate the emanation zone. US Army personnel were required to have, at minimum, an exocortical interface implant. However, the interface itself was now a liability when engaging FOG in close proximity. In one key battle in urban Borovia, two dozen suicide bombers rushed a US Army company as they closed in on a location believed to be FOG's operational headquarters. The company's gunners froze, however, when they saw the faces of the oncoming bombers. Through their exocortical interfaces, the gunners' identities were extracted and cross-referenced with their social media profiles. 3D reconstructions of the faces of friends and family captured from their profiles were rapidly stitched together and, through their augmented reality displays, overlaid on the faces of the incoming attackers. It



took microseconds for the FOG's algorithm to take effect, and a mere 30 seconds for the entire company to be wiped out by the attack.

Cuza uttered a Donovan swear and took a step back as a technician approached holding a subdermal gun. The technician froze and shot Lt Malkin a look of panic. Lt Malkin approached and stood between the two. "Velez!" she shouted, keeping her eyes on the Donovanian. "Get over here." Corporal Talon Velez, the platoon's Donovan interpreter, jogged over to his lieutenant's side.

"Sir?"

"Tell Sgt Cuza this is an AR beacon. It has no data receiving capabilities, and isn't connected to the network. It uses quantum pairing to maintain the link."

Velez hesitated, then said in Donovan, *"She says it uses very good science. No signals."*

Cuza smirked and replied, *"If I die down there and you all survive up here, it will not look good in American newspapers. Also, it will not look good in Donovanian newspapers."*

Velez turned to Malkin. "He says okay." Velez then gestured for Cuza to lift his shirt, which he did.

#

The Leviathan PT23 served as a mobile forward operating base, and could transport a small battalion. Its ultra-lightweight metal nanocomposite body resembled a miniature aircraft carrier, and was constructed of magnesium infused with ceramic silicon carbide. Plasma thrust engines kept it airborne and stable 10,000 feet above the ground. Petru Cuza casually walked to the edge of an open bay door, did an about-face, saluted Lt Malkin, and silently fell backwards into the open sky. The platoon had all gathered on deck to see him off, as was customary for ground drops. A young private shuffled close to the edge and peered over, keeping a hand firmly planted on the side of the door. He watched Cuza's body grow smaller as it plummeted toward the earth.

"Please refrain from committing suicide today, Private," deadpanned Lt Malkin. "Not in the mood for paperwork." The private and his goofy grin ambled back to the platoon, and the crowd unceremoniously dispersed.

Cuza's body, meanwhile, was plummeting toward the dense grid of Ithuva - an ambitious city once heralded as the East's most expertly engineered and organically flowing urban center, surpassing even the streamlined layout of New London in its ruthless efficiency. The ribbon-cutting ceremonies in 2028 unfortunately coincided with the arrival of the most crushing sanctions ever imposed by the West when Donovan's secret "grey goo" weapons program was uncovered. This was a brazen violation of the UN Treaty Against Lethal Applications for Nanoscale Technologies, and it had cost Donovan dearly. Almost no one could afford to lawfully occupy the towers of Ithuva, and so it slowly became a magnet for squatters



across all of Eastern Europe. Poor families arrived first. Next came the addicts and dealers. Then the gangs who fought to supply the dealers. The poor families caught in the middle of the madness became a worldwide symbol of the human cost of bad political actors. Sanctions were lifted in 2041. Only in the past five years had relations healed enough to make the joint Strike Force a political possibility.

Cuza maneuvered his fall between two massive towers. When the altimeter read 500 feet, his chute auto-deployed, and the thermoplastic polyethylene canopy locked into place. An array of ionic microthrusters in the canopy slowed his break-neck descent. Within three seconds his feet were lightly touching down in an overgrown courtyard 3,000 meters from the area of operations.

“Touchdown,” said Corporal Lee Tannhauser as he stared at the satellite feed from the PT23 war room. “Chute going dark in three... two... one...”

Cuza had already cut his chute loose and made his way into the alleyway when the crumpled parachute ignited. The thrusters, sensors, and communication devices all exploded in a rapid succession of small bursts. The chute quickly flamed out, and left behind a mere heap of smoldering ashes that quickly scattered in the summer breeze.

As the platoon watched Cuza disappear between the buildings, the AR beacon came online. It was a simple circle overlaid on the screen in the form of a flat compass.

“Tannhauser, I want color codes on the locals,” ordered Lt Malkin. “Get a low-bird to put out a net.” Tannhauser typed a command to the low-altitude biometric drone that circled the complex. The drone emitted an electromagnetic field that served as a medium for capturing individual human brainwave activity in the area. Within seconds, the screen lit up with small circles of white, yellow, and orange. A white circle represented a person at ease, yellow meant an unspecifically alerted person, and orange was a person keying in on a specific threat. There was also a code for red, however no one within the EM field had yet escalated their mental state to fighting condition.

“Got a couple oranges around the courtyard, but they’re moving away from our boy,” said Tannhauser.

#

Through a grimy window on the third floor of what was once luxury housing, Cuza could see the target building. It was coated with graffiti that he recognized from recon photos. He reached into his pocket and touched his laser tagger - the one piece of electronic equipment he'd brought along. Footsteps echoed up through a nearby stairwell. They quickly multiplied in number and pace. Cuza removed the Bowie knife from his hip and flattened himself against the wall near the stairwell door. If he was blown, he might be able to neutralize at least three hostiles before being overcome. The door burst open and five adolescent boys sprang out into the hallway. Four ran past him, oblivious, but the fifth leapt back when he saw the massive



soldier clutching his blade. The boy fled at full speed, and Cuza quickly made his way into the stairwell and up toward the roof.

"We have an orange moving toward that cluster of whites," called Tannhauser.

Everyone continued watching as the orange dot caught up to the four white dots. They all stopped moving for a moment, then all four whites turned orange and scattered. "He's blown. Should we run TAC for an extraction point?"

"He didn't tag them, so I'm thinking we have a group of alerted civilians. The scatter pattern is odd, though. Run TAC on the best vantage point for tagging and send in a pigeon. I'm not aborting over a handful of orange. Probably kids."

Velez chimed in, "Be sure TAC sets the output to Donovan."

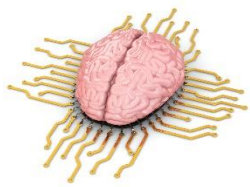
"Good thinking, Corporal," said Lt Malkin.

Tannhauser called out "TAC Integration!" and the main display of the Tactical Analysis Cortex to his left pulsed blue to confirm receipt of the verbal command. He made a hand gesture at the satellite screen, which also pulsed blue to confirm data capture of the feed. Tannhauser then typed a command to TAC to analyze population movements for the optimal evasive window. TAC ran its predictive algorithm, and a few seconds later a small blue square appeared on the satellite feed. "Got him a hiding spot," he announced. He began typing again. "Deploying pigeon."

A synthetic pigeon was the safest means of communicating with Cuza. It would simply fly in toward the beacon, land, print out a five centimeter square of paper, and fly away. In this case the printed message was a simplistic map of the area, with a blue square marked as the best vantage point to hide and tag the targets.

Cuza quickly made his way toward the edge of the roof, laid on his stomach, and removed the laser tagger from his pocket. From his other pocket he removed a telescoping spyglass with a flare-proof lens. He hastily surveyed the target building across the street. He scanned systematically, window by window, searching for signs of FOG activity. His spyglass stopped moving three floors from the top when he spotted a dozen military-aged men carrying several black cases into a room. When one of the men bent forward to set down his load, his collar moved just enough to expose a black fist tattooed on his neck. Cuza quickly aimed the laser at the man and clicked the tag key.

"First target located," announced Tannhauser. The laser pulse lasted a mere microsecond, but the signal was intense enough for the satellite camera to pick it up, map the endpoint of the signal, and tag the nearest corresponding colored dot as a hostile. The white dot on the satellite feed now featured a thin green corona, as in "green light" to neutralize. The surrounding dots soon followed suit until the entire cluster was made of white dots with green circles around them.



Not wanting to push his luck, Cuza put away his tagger and scope and prepared to move to another vantage point. He was caught off-guard when a pigeon swooped in and landed less than a meter in front of him at the ledge of the roof. It bent over awkwardly and dumped the small payload from its rear. Cuza chuckled in spite of himself, sat up, and picked up the paper. As he squinted to make out the message, the pigeon atomized, and tiny chunks of concrete from the roof's ledge tore through the skin on Cuza's face. Stunned, he looked toward the target building and saw a muzzle flash. He heard a smacking sound, and blood splashed up into his eyes. It took a few moments for the burning sensation in his side to rise up and make itself known. Cuza quickly rolled himself toward the roof access door as more sniper bullets whistled over his head.

"Where'd his beacon go?" asked Lt Malkin. "I can still see him on the roof. And where's our pigeon?"

"They both went offline - one right after the other, sir," reported Tannhauser. "Sir, our targets are now in the red."

"Give TAC a neutralize command. Small arms only - contain it to the floor they're on."

Corporal Mooney ran up to the satellite screen and pointed at the tiny group of pixels that represented Cuza. "He's still moving! Our comrade's breathing!"

"Get an extraction unit over to the rendezvous point," ordered Lt Malkin.

Mooney spun around. "He's not gonna make it there. We put that beacon right under his ribcage. If it's damaged, he's bleeding out."

"He's a DN Atty," Velez reminded them. "His blood clots way quicker than ours."

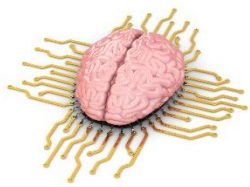
"That's right," added Lt Malkin. "And he can control his adrenal response so his heart doesn't pump half his blood out onto the floor. He'll make it to the extraction."

"Sir," interjected Tannhauser. "It's highly likely that Cuza didn't have time to read the message before he got hit. He probably doesn't know where he's supposed to be headed."

"He made it to the door!" called Mooney. "He's... okay, he's in. He's inside the building."

"And out of our sight," said Lt Malkin, gravely.

Just then, a US strike drone dropped into the emanation zone between the two buildings. A window opened on the main screen that displayed video from the drone. The platoon could clearly see the FOG fighters attempting to flee. Without need for further human-in-the-loop commands, the drone opened fire with massive plasma bolt cannons. The green and red dots quickly vanished from the screen. Moments later, the drone's video feed went dark.



"They have our drone, sir," said Tannhauser, helplessly raising his hands in the air.

They watched the satellite feed as the drone turned 180 degrees toward the building Cuza was in and opened fire again. The firing only lasted for a brief moment before the ammo chambers ran dry. Attack drones that were sent into a FOG emanation zone always dumped 75% of their payload beforehand, as it was a certainty they'd be hijacked during the operation.

Cuza went down five floors and dropped to the ground of the hallway so he'd be clear of the windows. He'd already torn off his shirt and wrapped it around his midsection to help the clotting agents in his modified blood do their work. Pain was a muted experience for his kind. Pain signals made themselves known, but caused a relatively low level of neural activity so as not to overwhelm the senses and affect cognition. He crawled on his elbows away from the stairwell to seek out a hiding spot, careful not to leave a blood trail leading straight to himself.

There was a sudden loud crash a couple floors above him, then an explosion that tore through the ceiling over his head and rained heavy chunks of concrete down on his body.

"Sir, the enemy has rammed our drone into the building."

#

The platoon gathered around Velez as the goofy Private helped fit him with his parachute. The Tactical Analysis Cortex had selected Velez from the platoon's personnel records based on several factors that reduced his emotional exposure. He had no living immediate family other than an estranged half-brother. His social media activity was extraordinarily scant, and what did exist online showed no evidence of a serious romantic relationship. The Private cinched a final strap and then slinked away.

Mooney approached while inspecting a FN F8000 assault rifle in his hands. He looked up at Velez and presented the weapon to him.

"Don't know what to tell you, Corporal," said Mooney, shaking his head. "It's not much, but supposedly FOG doesn't have much better. They can hack a satellite with an electronic cigarette lighter, but they're still using antiques like this."

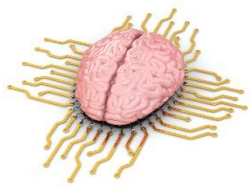
Velez took the rifle and inspected it. "Where did you even find this?"

"Courtesy of our Donovanian friends. Their urban assault units go up against FOG with these. Guided bullets are too risky - afraid they'll end up making a U-turn right back at them. So they just use these straight-shooters."

Lt Malkin stepped forward and put her hand on the F8000. "Good news is, no one's gonna hack your weapon. Bad news is, these things are loud. Or so I've heard. Never fired one myself."

Velez nodded and turned his gaze toward the open bay door.





"Oh, you didn't think we'd send you out with just this pop gun in your hands, did you?" asked Lt Malkin. She turned around and made a beckoning gesture. The platoon parted and let through a Legged Squad Support Unit. The dog-sized robotic quadruped slowly trotted toward Velez and then froze.

"Kevin!" cried Velez. "Come here, boy!" The headless LS2U made no further movement. "Why isn't he responding?"

Tannhauser chimed in, "He's been configured to not accept any commands via wireless protocols. In fact, I completely removed the adapter. His only preset behavior is to remain at three meters at your perimeter and utterly destroy anything that threatens you."

"It'll also pull you out of the line of fire if you go down," said Lt Malkin. "Now let's get moving. Go fetch our Donovanian comrade, or confirm that he's KIA. For diplomacy's sake, let's pray it's the first."

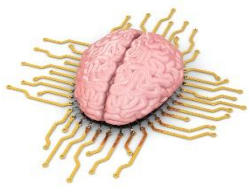
#

Velez and Kevin's parachutes deployed in unison over Cuza's former touchdown spot. TAC had determined the location was uncompromised. As the chute remnants turned to ash, Kevin quietly shadowed Velez into an alley. The LS2U was a descendant of the LS3 - an early quadruped meant to help Marines lug gear through the rocky mountains of Afghanistan. The loud actuators in LS3's dog-like limbs made it useless for anything in the field other than drawing sniper fire, so it was quickly shuttered. Upon the arrival of soft actuator gear-trains, the sound leakage became a non-issue, and the program was resurrected.

Velez moved toward the smoke that still billowed from a crater in the side of the luxury highrise. When he got into an adjacent building, he caught his first glimpse of the smoldering rubble from a low angle. The mission suddenly felt much more about identifying human remains than performing an actual extraction.

Even with Kevin at his six, it was hard for Velez not to feel naked. The team back in the PT23 was tracking him, but they were helpless to provide any real support. His tactical gear was stripped of all physiological monitoring, communications, and nanomedical modules, as all of those contained penetrable communications. Left intact was the magnetorheological liquid armor shell that transformed itself into a solid when the force sensors on the armor plates reached a critical threshold. This, combined with the thermal insulation layer, protected his body from most ballistic and energy weapons. The composite exoskeleton had no communication capabilities, so it was left intact.

Velez heard some men screaming in Donovan outside the building, then a grouping of frantic footsteps. He looked out of the nearest window to see a dozen women and children being rounded up and ushered toward the target building. When they were gone, he went out a rear exit and made his way to the damaged luxury housing building. Aside from the civilians being taken hostage by FOG, Velez hadn't spotted a single resident. They were all presumably



laying low until the fighting was over. He began to make his way up the fire stairs, and Kevin silently climbed behind him.

When he reached the fifth floor he heard a door open two flights below him, then footsteps climbing upward. Velez increased the pace.

*"Who is it up there?"* one of the voices called in Donovan when they heard Velez and Kevin's steps. *"Semyon? Nikolay?"* Velez took his F8000 off his back and disengaged the safety. He then began leaping up the steps five at a time, his powerful bounds enabled by the exoskeletal enhancements on his ankles, knees, and hips. Kevin struggled to keep up.

*"Announce yourself! Report!"* the other voice called. When Velez declined to answer, he heard one of them call for backup. *"Hostile in the south stairwell of tower four! Sixth floor, headed toward the roof!"*

Velez reached the tenth floor and exited the stairwell. This was the epicenter of the blast, and the crater had taken out twenty feet of flooring in the middle of the hallway. He ran at full speed toward the opening and leapt over it, clearing it with about four feet to spare. Kevin halted at the edge of the crater, seemingly unsure of the next move.

"Sorry, boy. Have to catch up with you later."

The two FOG fighters emerged from the stairwell door and immediately opened fire. Velez turned and crashed through the nearest door, diving to safety as their bullets filled the hallway. A second later he heard a flurry of plasma bolts being fired from Kevin's mounted cannons, then silence.

Velez looked up and saw three terrified Donovanian junkies scrambling in slow-motion to escape the room. One of them dropped her jet injector and started to go back for it. When Velez stood up, she took a look at the F8000 and changed her mind.

He peeked out into the hallway, but Kevin was gone – presumably to find another way around the crater. What remained of the two FOG fighters was scattered around the hallway. The blood was minimal, as the tissue instantly cauterized when the plasma bolts exploded on impact. Velez took a moment to survey the crater and the exposed floors below. He saw no immediate signs of Cuza or any other blast victims. He was thrown back suddenly when a high-velocity bullet struck him directly in center mass. His liquid armor had solidified instantly, sending the deformed bullet to the ground at his feet. He looked across the street and saw a phalanx of fighters with rifles aimed at him. All at once they opened fire, and he crouched into a ball. A hail of bullets pinged off of his suit and helmet for a moment before Kevin returned fire from downstairs. Velez remained huddled until the firing stopped. He looked across the street to see a massive scar across the side of the building.

Velez made his way toward the stairwell on his side of the crater when three more fighters emerged from the door. Velez opened fire with his F8000, and the weapon's report startled him so badly that he nearly dropped it. He recovered, then crashed through another



door to escape the hallway. The other two fighters were steadily firing down the hallway, and bullets were tearing at the door frame. Inside the apartment he took cover behind the first available wall. He removed a flash stick from his belt and tossed it into the hallway. A blinding torrent of magnesium stunned the fighters and briefly halted the firing, at which point Velez rounded the corner and opened fire. When the fighters were down, he glanced back into the apartment and noticed for the first time the six children huddled around their terrified mother. Their eyes were all shut tight, and they silently whimpered and sobbed together.

Suddenly, a toddler's monitor hover-drone emerged from around a corner in the apartment. It was the type that followed children around and patched video to their parents' heads-up display glasses when they were out of sight. Now it was monitoring Velez. Another handful of similar drone cameras appeared out of nowhere – some from outside, some from floors below. He was being swarmed with commercial drones that were now under FOG control. Rather than open fire on them and further terrorize the family, Velez leapt over the bodies in the hallway and reached the stairwell, slamming the door shut behind him. As he made his way to the ground floor, the lights shut off. The emergency lights came on momentarily, then they shut off as well. Having no nightvision in his simplified helmet, Velez felt exposed. He groped his way to the nearest door around the fifth floor and exited.

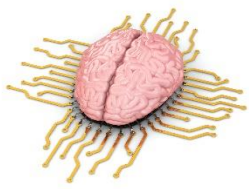
Waiting for him in the hallway were around twenty commercial camera hover-drones of all varieties. They swarmed him like angry insects. He managed to swat a few away, but was soon assailed by gunfire coming in through the hallway windows from across the street. His helmet and body armor took several hits. There were no doors nearby, so he simply threw himself into a wall and smashed through. Bullets pounded the rear of his armor as he raced through the apartment and jumped head-first through an opposing window. As the ground below rushed up at him, he managed to get his feet under his body. Velez landed on the sidewalk below with a loud thud, cracking the pavement under his feet. His exoskeleton could safely absorb drops from up to ten stories. Some soldiers had reportedly walked away from falls of over 200 feet.

A sudden movement to his left alerted Velez, but he let out a sigh of relief when he recognized Kevin's four legs awkwardly bounding toward him.

"Hey pal. Miss me?" said Velez, as he caught his breath.

Kevin raced to get within protection range of Velez. Suddenly, a large delivery truck hopped a nearby curb and slammed into the LS2U at full speed. The truck carried Kevin into the side of the building's wall, which collapsed around the truck.

Velez spun around to find a taxi hopping the same curb and coming at him full-speed. He rolled onto the hood of the car, which carried him for ten feet and crashed into the building. Velez was knocked out for a brief moment, but came to just in time to see a swarm of unmanned cars filling the street and racing toward him. He rolled down the front of the taxi's hood and collapsed in the lobby. His weapon was broken, his exoskeleton was malfunctioning, and his body armor was glitching from liquid to solid and back again in a chaotic pattern. He had no time to strip it off, as every autonomous car on the block was now under FOG



control. The cars began slamming into one another and crashing through the walls of the lobby. Velez turned and ran in the opposite direction, back toward the main street where he would be exposed to gunfire.

Panicked, he ran into the street where five FOG fighters casually walked toward him. Between Velez and the fighters were a dozen industrial exosuits filled with women and children. They were clearly being controlled from elsewhere, and the poor civilians strapped inside of them were being used as walking human shields. Velez was also trapped. FOG clearly intended to capture him.

One of the people locked into the walking exoskeletons stood out to him. It was neither a woman nor a child. It was Sergeant Petru Cuza, and he was bloodied but alive. Velez looked behind him at the chaos in the lobby. He looked up at the smoldering crater in the building above. He looked at the terrified helpless souls trapped in the hijacked construction equipment. His suit glitched again, buckling his knee. Velez didn't fight to stand up. He dropped to his knees and put his hands behind his head.

As one of the FOG fighters approached to take him, the sound of awkward clanging steps emerged behind him. The fighter raised his weapon and fired directly over Velez' head to no effect. Kevin leapt over Velez and crushed the FOG fighter to the ground. Before the others could react, he wove through the exosuits and flanked them all. They, too, tried to open fire. Kevin's plasma cannons decimated them before they could get more than a handful of shots in.

Velez's damaged suit finally seized up completely, and he tumbled onto his side. He called out to Kevin, "Time to pull me out of here, boy!"

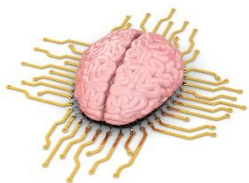
Kevin's legs were slightly damaged, but he could still walk, although with a great deal of accompanying noise. He turned and trotted clumsily toward the target building, from where the remaining FOG members were controlling the hijacked drones, cars, and exosuits.

Cuza's exosuit took a step toward Velez. Cuza struggled from within, but it was futile. The suit loomed over Velez for a moment before lifting its leg above his head. Suddenly, an intense low-frequency thud emerged from the target building. Cuza's suit froze in place, leg still raised. A swarm of approaching camera drones fell from the sky and clattered onto the floor. The engines of the cars in the lobby all shut off.

Velez heard Cuza sigh, then laugh. Flecks of blood flew out of his mouth as he chuckled. He looked down at Velez, smiled, and said in English, "He was good dog."

Up in the Leviathan PT23, Tannhauser turned to Lt Malkin and announced, "Kevin has deployed an EMP, sir. All electronics in the area of operations are disabled."

Lt Malkin smiled and nodded. "Set her down, Tannhauser. Let's pick up our boys."



Science Fiction:  
Visioning the Future of Warfare 2030-2050  
U.S. Army TRADOC Mad Scientist Initiative



Justin Kirkwood is an Analyst in the Project Management Office of Design Interactive, Inc. He has worked in the military simulation and training industry since 2012, and is a vocal champion of optimizing the human dimension of warfighting.



## Every Day Is The Day It Changes

By Dr. Charles E. Gannon

### ATTACHMENT A:

May 14, 2045

My story is no different from thousands of soldiers before me, and, I suspect, no different from thousands more who will follow, on missions into the vertical megalums that are our contemporary battlefields. The technical details of each mission—the transit points, the target city, the toys and the tools used by and against us—are never exactly the same. But the chaotic AOs, the crappy intel, and the “collateral damage”: that never changes. Ever. And you know it from the moment you’re wheels up, a sensation in your gut that confirms you are flying straight into some kind of Hindu inevitability, some endless cycle of fated action and reaction, insertion and outcome.

By the time you’ve shaken out all your equipment, made sure your Know-It-All automated assistant has been patched to the latest version, and grabbed a meal, the mottled green of Africa is scudding below you. You’ve been to that continent’s hotspots—flat urban sprawls where conditions have steadily worsened since the end of the first Cold War. Development money never arrived in large enough amounts, or for long enough intervals, for them to imitate the iconic megacities of Asia, and some parts of South America.

You are landing to take on fuel in Dubai, whose rulers are friends—at least this week. As you angle toward the runway, you can see places where the unrelenting sand has advanced upon the city. As dusk rolls in, the buildings—once ablaze with light—are lit selectively, large swathes of the urban expanse now dark and windswept. Although oil prices did rise again after the Renewables Reset of the 2020s, petroleum sales have fallen by almost a full order of magnitude since the 20<sup>th</sup> Century. And the fortunes of those nations whose lifeblood was a two-toned mix of black crude and green petrodollars has decreased along with the demand levels. Now, renewable energy sources are what power the small econoboxes which occasionally zip along Dubai’s twilight streets. The high, multiple headlights of big gas-guzzlers mark the remaining oil elites who risk navigating the roads as yet another climate-amplified sandstorm bears down upon what was once an icon of urban opulence.

As you take off again and bank eastward over the increasingly storm-wracked Persian Gulf, the lights floating offshore are sparse. Not only do fewer tankers ply the gulf’s waters, but the availability of luxury items—and even necessities—has shrunk. And not just because of Dubai’s withered bank accounts. The smaller, more numerous cargo hulls that once dotted the globe’s oceans now populate ship graveyards around the world—the largest just fifty miles east of Singapore. But the need to transship food to nations which have traded caloric self-sufficiency for urban contraction is rising to critical levels.

The darkness of the Arabian Sea slips beneath you. You doze. Maybe, you’ll sleep...





Much later, you awaken to the tense radio chatter that means you are now dropping out of hypersonic flight and approaching the contested South Sea airspace. Although technically non-territorial, it's still partially the domain of the nation that once stood sure of providing the world with an endless flood of goods, the ships that would carry them, and which put the concept of the vertical megacity on the map. China—its steel and shipbuilding industries unable to recover after sequential rounds of currency instability, overtonnage bankruptcies, push-back against subsidized production, and geriatric pressures—is no longer able to rebuild the world's merchant fleets. Shipyard skills that laid dormant for almost a decade are slow to return—too slow to deliver the hulls needed to move staples from the automated megafarms located mostly in North America (and, increasingly, Russia) to the starving metropoli of the faltering under- and un-developed worlds. Including the megaslum toward which you are now heading.

Which will it be this time? The odds in the betting pool favor Manila or Jakarta. Both have tumbled into near-lawlessness, where critical shortages of food, utilities, basic medical services is the new norm. Both are soaring edifices of defunded dreams and urban neglect, undercity dwellers looking up at faded glass skyscrapers through the criss-crossing walkways and transverse constructions that link buildings above the toxic ground-level sprawl. Both are known to face threats from PRC security formations, North Korean “political mercenaries,” megacorporations, terrorists, and indigenous syndicates of varying levels of legality.

But you could be touching down almost anywhere in the PacRim. With the exception of Japan, Australia, and South Korea, few of the major economies or their major cities are completely without need of external assistance, on occasion. Whether the news is reporting your intervention as preemptive, defensive, humanitarian, or otherwise, you already know it will be e) all of the above. Because no matter how it starts out, that's almost always the way it winds up.

The more senior NCOs are grouching, as they always do, about the lack of a pre-mission brief: it was once standard practice, back in the day before any wall could sprout ears and eyes. Then they grouse about the new sequestered barracks you've all been living in during your turn in the rota as a ready reaction force. And everyone bitches about the two hour roll out that started at 0100 hours with biologically-tailored slow release power bars and what the REMFs like to call “fortified hydration drinks.” And which you all call rat piss.

At least the complaining gave you something to do as you waited through the preflight viral and microbot checks. You just hope they worked this time—since they don't always—and that, prior to this sequestration, you weren't targeted with a sleeper bug that could be triggered by almost anything: a radio signal, a disguised additive in water supplies, an activating agent in local foods, or even the air. By staying isolated in self-contained barracks that function like an inverted quarantine zone, you're largely safe from the designer infestations that plagued deployments ten years ago. Problem is, when a bad bug hits a unit now, the OpFor times it to happen in the field, at the worst possible moment--and so quickly that your people get steam rolled. And no one ever finds out what, or who, the culprit was. So now, when sequestered in the newest, self-contained secure bases, you live away from family, from friends, from the whole damned world as you pass the days both hoping for, and dreading, the possibility of a mission—of something to relieve the endless round of training, waiting, and trying to act like you're not worried.



Because as bad as it's been out there since the Downturn of 2040, there are whispers that its been getting worse. There are rumors that the Chinese have been providing their proxies with an export version of their fully autonomous combat robots or killbots, as you call them. Highly effective, you remember your first mission, wishing, cursing, that your platoon had its own killbots. Then you saw the PRC death machines untroubled when civilians got in their line of fire—and you became glad for your own, more versatile and operator-controlled anthrobots: human shaped machines that use much of the same equipment you do, but have integral armor and sensors that you can only wish for.

And there are other, darker whispers: about cyborg soldiers emerging from outsourcing Chinese or megacorporate labs with bionic enhancements. Arms, legs, eyes, embedded sensors, maybe direct neural interface for controlling weapons and drones. The NCO's who overhear the whispers mutter something about the new directional EMP emitters having lots of excellent uses beyond knocking down the enemy's omnipresent drones. You just hope they're correct.

Then there are the chimera: genetic hybrids that are reputed to have been retroaltered by third generation CRISPRtech. Some emerge from their glass cocoons looking like cave men—Neo anderthals, they're called—others like human gazelles, some unchanged—except inside, where improvements run the gamut from better senses to an increased proportion of fast-twitch muscle issue. And then there are the subjects who don't survive the process...

But the most worrisome of the rumors are about repros: clones who are all produced from a single optimized genecode and who are then raised, trained, and modified to fit whatever need their masters might have. Some say the Chinese have started down that path. Others are convinced it's being done by various false flag labs underwritten and overseen by megacorporations in their eternal quest to gain increased power by setting the nation-states at each other's throats. Wherever they're from, and whoever they are, it's the stuff of nightmares: originally identical humans, they are modified and customized as required by their creators, maybe by the highest bidder. They are raised to obey and, probably, are embedded with genetic flaws that ensure they'll die by thirty. Assuming they survive that long.

Sometimes you wish for a few of the edges that the OpFor enjoys. Yeah, your HUD display helmets and semi-autonomous assistants give you all the data you need, when you need and —usually—nothing else. Your links are solid, particularly now that the platoon level drones are tied back to the rear by lascom: not hackable, and damn hard to block. Biomonitors in your fatigues not only send your vitals back to the guardian angels in remote medical ops, but an embedded autonurse knows when your autoinjector needs to hit you with a stim, an anaesthetic, or a shot of epinephrine to save your life. While not hybridized or retrogeneered, the younger troops are first generation gene-screened: robust and with the best naturally-occurring combination of metabolism, reflexes, and muscle mass. And for those who missed the designer geneeering wave, strength wearables, cybernetic prostheses, and wound repair microbots help you keep up with the Gattaca babies. To date, all those enhancements—and the smart weapons and all-spectrum sensor suites—have given you the edge you need.

You just hope that today is not the day that changes.

\* \* \*



AFTER ACTION REPORT OPERATION VAPOR HAMMER  
RETRANS CINCPAC 2045.05.16 1922 Z  
TS: DISTRIB. CODE QZ78C

The attached narrative (see above) was found on a damaged non-reg datatablet, abandoned in the reclaimed LZ. The datatablet screen was destroyed by a fragment from a 12mm antipersonnel rocket, but the drive remained intact. The narrative is the only record retrieved from the AO, other than comchatter transcripts.

VTOL assets of Operation Vapor Hammer detached from CX-29 hypersonic dropship "Pika Don" at 2045.05.14 0344 Z, 21.3 km altitude over Kuala Lumpur. All three V-29 Shrike assault verticals survived OpFor's high altitude interdiction screen: lighter-than-air platforms which cradled small rockets. All were neutralized using minimal point-defense fire from on-board batteries. SOP drop followed, with ducted fans engaging at 3400 m altitude, slowing final approach to 8 mps at terminal counterthrust altitude. Solid rocket pods were expended in SOP braking maneuver and jettisoned without incident.

Standard performance envelope for conventional VTOL ops was established and confirmed by Hammer Flight Leader Capt. Eliza Herrero at 0346 Z. Vapor Hammer reported ineffectual light weapons fire from buildings near LZ, but suffered no hits.

Smartdust cluster-bomblets were deployed at 32 m altitude. Microwave pulses from Shrike 2 illuminated bio-altered smartdust on four figures in ambush positions. Probability that figures were OpFor was deemed within RoE confidence levels and an automated firing solution for the Shrikes' retasked PDF batteries was approved and engaged by Capt. Herrero. All four figures were neutralized and later confirmed as Opfor KIA equipped with second-generation *Baneul Pogpung* close assault systems.

Creepers were advance-deployed by tube launch into the target complex. 114 of 120 total creepers emerged with nominal function. They immediately established a swarm network and relayed 3-D perimeter map and security assessment of floors 143-144 to a mean depth of 29 meters as measured from the southwest face of the target structure. Semiautomated security assessment by REMOPCON with Carrier Group Valiant (currently Andaman Sea) was vetted and approved by Vapor Hammer CO, Major Andrew Price via secure lascom at 0349 Z. Vapor Hammer was given green light for insertion.

Shrikes 1-3 touched down in SOP safe intervals from 0349-0352 Z. Debarkation proceeded without incident. Perimeter sweep also proceeded without incident and confirmed the findings of the creepers, which were then set to expand mapping and security surveys to a radius of 100 m within the target structure. No sign of hostiles was detected.

At 0408 Z, Pvt. Steven Martinelli reported vermin moving inward past his position. Capt. Herrero ordered Martinelli to disregard and keep channels clear. Staff Sergeant Clay Latour instructed the platoon to sound off, by fireteams, regarding similar sightings. Four of six perimeter guards reported similar sightings, as did two who were setting up the temporary CP.

Capt. Herrero instructed Sgt. Latour not to countermand her orders. Sgt. Latour explained that the sounds, smells, and motion associated with a platoon level insertion



normally scatter vermin away from the LZ, and that this was therefore a potentially dangerous anomaly.

The tempo of vermin reports increased rapidly from 0409-0410 Z. The vermin—all mice—were placing themselves in close proximity to electricity sources, mostly those worn by the troops of 2<sup>nd</sup> Platoon, C Company, of Rapid Reaction Task Force Sierra Echo Niner.

Capt. Herrero was in the process of rescinding her order against reporting on vermin movement when RF scanners detected pervasive low-grade EM activity in the LZ and up to 15 meters beyond. Reports and measurements of this effect were never completed: 12 mm antipersonnel rockets were ripple-launched from the surrounding sky-rise structures at 0411. At 0412, sustained MANPAD launches of “Stilletos” (SAM-23b’s) disabled the left turbojet nacelle of Shrike One and severely wounded both the pilot and copilot of Shrike Three. REMOPCON automated analysis indicated immediate withdrawal; CO verified and approved, ordering Shrike Two to provide PDF cover while Shrikes One and Three level-burned out to ten kilometers south of the AO. Capt. Herrero’s protest against the withdrawal order was overridden. At the time contact was lost with all the suit-embedded bio-relays of 2<sup>nd</sup> Platoon, fourteen were redlined, eight more orange. At 0416 Z, all contact with sensors in the AO was lost due to jamming.

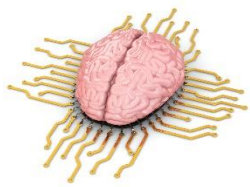
At 0438 Z, contact was established with Second Platoon, First Squad’s anthrobot SE92C1-“Tinman.” Live operator control, enhanced through the use of a kinetic telepresence suitsuit, was reestablished by lascom link to the sensuite in REMOPCON. Data review of the anthrobot’s on-board recorder indicated that when severed from comms, “Tinman’s” autonomous tactical preservation system instructed it to drop down a 12 meter vertical airshaft, thereby avoiding the 12mm missiles, and evidently carrying it beyond the RF disruption zone. Once in full control of the unit, “Tinman”’s operator, Chief Warrant Officer Latisha Johnson, walked the anthrobot back to the LZ to assess area security.

The LZ was deemed reapproachable at 0447 Z. At that time, TF SE9 CO Colonel Tracy Merriman dispatched anthrobot rescue team ASaR 1 to the site, supported by Shrikes 4-6. The Shrikes were equipped with deployable PDF quad-rotor drones to help protect against further SAM attacks. No further SAMs were launched.

ASaR 1 was inserted by Shrike 5. The four anthrobots conducted a sweep out to the limit of 2<sup>nd</sup> platoon’s perimeter at the time of the attack. The anthrobots recorded most of the casualties eventually confirmed in the followup sweep conducted by SaR2’s all-human rescue and forensics team beginning at 0515 Z.

2<sup>nd</sup> Platoon sustained 22 KIA, 3 WIA (critical medevac required) 13 MIA. There was no clear indication of where the MIAs were taken or where they might have relocated. However, sniffers coded to detect ingested perspiration chemical markers suggest that they may have fought through to a freight elevator and rappelled to safety in the lower levels of the Kuala Lumpur megaplex. Drone and creeper search efforts are ongoing.

SaR 2’s forensics expert had, by 0700 Z, collected samples of both the mice and what at first appeared to be caked dust on various surfaces in the AO. On closer examination, the dust proved to be nanosensors with sensitivity to visible or infra-red EM emissions. It is hypothesized that they may work as some form of passive phased array, possibly modulated to work as a dispersed IR sensor.



The recovered mice require further examination, but forensics suggests that they may have been geneered to be attracted to the magnetic fields generated by electric current. This would have attracted them to the soldiers of 2<sup>nd</sup> Platoon and their equipment. There would have been no distortion from surrounding power supplies, since the entire AO was known to be without current (and was therefore deemed a safer insertion point, since any active devices would have to be self-powered, and therefore, be immediately detectable by their emissions).

In summary, SaR 2's forensics expert hypothesizes that once released, the mice sought proximity to the platoon and its equipment. This defeated 2<sup>nd</sup> Platoon's thermoflage suits and cold cans, since the rodents' body heat was detected and localized by the dispersed nano-array, which sent a locator burst to whatever repeaters triggered and aimed the 12 mm antipersonnel rockets. Further investigation of the materials found in the AO is ongoing to either disprove or refine this hypothesis.

The owner of the damaged dataslate, Pvt. Steven Martinelli, is among the missing.

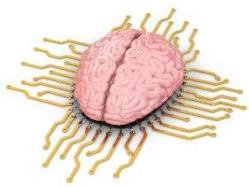
FILE ENDS

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Dr. Charles E. Gannon is a Distinguished Professor of English at St. Bonaventure University, is a five-time Fulbright recipient, and was a Fulbright Senior Specialist from 2004-2009. His award-winning hard-SF "Caine Riordan" novels have all been national bestsellers and Nebula finalists.

His best known work of non-fiction, *Rumors of War and Infernal Machines* won the 2006 American Library Association Award for Outstanding Book. In addition to appearances on media venues as diverse as NPR and the Discovery Channel, he has served as a subject matter expert for many intelligence and defense agencies

Prior to his career as author and academic, Dr. Gannon was a scriptwriter and producer in New York City, where his clients included the United Nations, the World Health Organization, and various Fortune 50 corporations.



## Gods of Olympus By Mike Matson

"Final Readiness check on my mark. Sound off in order. Skinny 1, all systems green. Ready for launch." Captain Jason Dix, ODA detachment commander, scanned his system screens in the bubble as he listened to his team each indicate their individual ROARs' readiness to launch. It was quick and precise. They were good to go.

"Colonel Moore, Captain Beam, ODA 326 ready for launch." He was surprisingly calm considering what was about to happen. *Trust your training. Trust your men.*

Lieutenant Colonel Moore, 3<sup>rd</sup> Special Forces Group, 2<sup>nd</sup> Battalion commander, spoke into the command net from his spot in the operations center sky box at Ft. Bragg.

"Captain Beam, passing TACON to the Haldeman for launch. ODA 326 will assume TACON once confirmed payload bus separation."

"Copy that JSOC. We'll launch on my mark." There was a pause then his voice came back on line. "XO, sound the missile launch alarm." There was a series of piecing ship horn blasts in the background. "On my count, turn key and fire. Three, two, one, launch!"

A video of the bow of the cruiser USS Haldeman showed a VLS-L canister door fly open and flames vent outward, followed by a common modular missile (CMM) shooting up into the darkness. In less than 20 seconds, another eleven of the six-meter-tall missiles launched into the night above a stormy Atlantic Ocean, 640 kilometers off the coast of Africa.

The video shifted to a tracking camera from the USS Spratly Islands amphibious assault ship 2 kilometers to port, which was launching a FAST team in a trio of Quad rotors. Smoke enveloped the Haldeman as the missiles raced at astonishing speed up and to the southeast out of sight. Everyone's screens flipped to the Haldeman's 3D missile tracking radar. A countdown timer in bold numbers showed how long until the boosters cut off and a second counter displayed how long until the payload buses on the missiles separated.

Inside his bubble, Captain Dix casually chewed on an energy bar as he watched the countdown timers. Skinny 1 was holding together well according to telemetry. He flipped the display and scanned the status of Skinny's 2-12. Everything was checking out. He conferred briefly with his ADC, CW2 Tillerman, then continued eating. At the 20 second mark on the booster clock, he brushed the crumbs off his hands and spoke to the team on the tactical net.

"Prepare for booster cutoff and drag maneuvers. Keep things tight and watch your horizon." A chorus of "yes sirs," answered him.

"If your telemetry starts to go to s%\*t, hit the emergency punch out and try and save it. Otherwise, let the computer take you in but be ready to override if needed."





The boosters cut out and the missiles continued to plow through the atmosphere. Without the booster propelling them, drag quickly began to slow them down, helped by drag panels deployed from the sides of the missiles. As the missiles reached apogee, they had slowed to just over the speed of sound. The missiles arched over, and the fairings popped, revealing the payload bus for each missile.

The launch was designed to release TF Skinny just as they crossed the African coast. At 45 kilometers above the earth, and traveling at Mach 1.3, the 12 payloads all separated cleanly from their boosters. The payload buses launched their payloads in a way to give them a short pop-up maneuver to obtain better lift. Composite wings, attached to large, vaguely humanoid forms, deployed in milliseconds, turning each payload into a faster than sound glider.

Captain Dix heard LTC Moore in his headpiece, “Good launch Haldeman. JSOC thanks you for the smooth delivery. Captain Dix it’s your show. Go get our Ambassador.”

“Copy that sir.” *Time to break things and hurt people.* He flexed his hands in the VR gloves and gripped his joysticks to start piloting Skinny 1 if needed.

Captain Dix kept his hand lightly on the left joystick as the glider’s AI kept him within the projected race track on his view screen. ODA 326 formed up in a line 20 kilometers long in the stratosphere and followed the virtual paths on their screens in a shallow glide towards their target, massive sonic booms punching the night sky as they zipped along at 1500 kph.

It took 12 minutes to travel the 260 kilometers until they were over their target. They had slowly descended the entire time. Now that they had reached the immediate target area, the gliders’ AI systems performed aggressive banking maneuvers to bleed off speed and height. When they hit 120 kilometers per hour, the AI handed off glider control to the SF operators, who continued circling as they prepared their final approach, riding thermals from the massive fires below them to stay aloft.

If it were daylight and people had bothered to look up, they would have seen 12 giant vultures circling like the city below was a wounded animal. Captain Dix took a moment to view the city below Skinny 1 and absorb the vision. His team was similarly awed by what they saw as they prepared to land. Kinshasa, a megacity of over 20 million people on the banks of the Congo river, and the Capital of the Democratic Republic of Congo, was burning.

#

12 hours’ earlier long simmering political tension had exploded in an attempted coup. Fighting had erupted in Kinshasa along multiple tribal and political party lines. The city saw hundreds of armed gangs boil out of the shanties south of the urban core armed with guns, machetes, and pangas. The speed and scale of the violence belied the publicly spontaneous nature of what was happening.



Kinshasa spiraled towards a Rwandan-style massacre with stunning speed. Tallies from smart-news aggregators suggested more than 100,000 dead in half a day, even when statistically adjusting for at least three different online covert influence campaigns JSOC's Zeus team identified hiding in the data.

Coup leaders were vilifying westerners as part of their campaign and there had been dozens of expatriates killed. Due to the chaos, 3<sup>rd</sup> Group had been put on standby for a potential AFRICOM NEO. The US Embassy was placed on lockdown after staff and the few dependents were brought inside from their nearby housing complexes. Almost 100 Americans were currently holed up inside the embassy.

Six hours after the coup started, the first shots were fired at the embassy. AFRICOM raced to put assets in place while the NSC decided whether to intervene. A 3<sup>rd</sup> Group ODA in Conakry was attempting to get to Brazzaville via commercial air, and a Global Strike Command UAV package had departed Rota. Still, all those assets were 8+ hours from being on-site, until then the embassy was on its own. The MSG detachment and the RSO team were keeping the attackers at bay for now, but only because the attacks were not well organized.

That's when the EXORD came down to launch ODA 326. They could get to the embassy from the Haldeman, over 900 kilometers away, in just 20 minutes. Supporting them would be a pair of F-35s from the USS Spratly Island MEU, and JSOC's Zeus team at Ft. Bragg.

The President gave the "Go" order during a break in an event at an elementary school in Vermont. ODA 326's EXORD was simple. Secure the US Embassy, the Ambassador and the embassy staff. Safely escort them to one of the designated emergency LZs secured by the follow-on FAST team. Load up on the quads and get the hell out of Dodge.

#

As they prepared to land, Captain Dix made contact with the RSO on the embassy guard frequency.

"US Embassy do you read me? This is Skinny 1, US Special Forces. Do you read me?"

"Skinny 1, this is Jose Montoya, embassy RSO. I read you. What's your 20?" In the background, Captain Dix could hear sporadic rifle fire.

"We're over the embassy now and are about to insert at LZ Charlie. Do you have any friendlies there?" The emergency LZs were mapped years in advance so both sides knew Captain Dix meant the rail yard two blocks north of the embassy.

"Negative Skinny 1, we are all inside the compound. We are receiving sniper fire from adjacent buildings, and periodic probes with dismounted troops and technicals." There was a pause and an explosion in the background. "I have the marines linking you into their VR feeds now. They can designate targets for you as you close on us." A blinking icon appeared on their viewfinders.



“Thanks, got it. We’re going to land, then move towards your position in parallel teams down Avenue Cataractes and Avenue de Hotel. We’ll put a perimeter box around you and converge on the front gate.” He tapped locations on the map in front of him, detailing for the RSO/MSG Det team and his unit the planned movement. “See you in a few. TF Skinny, prepare to land.” He tipped his glider over for final approach.

In front of him he saw the rail yard. To his left was cut timber staged for transport. To his right was the main riverfront boulevard, eerily deserted. He could not detect any heat sigs in the rail yard as he came in for a landing. Zeus had done a good job scaring everyone off.

He flared, his feet hit the ground, and the glider wings detached with a “psst” of compressed gas. He detached his battle rifle from his leg and ran to the edge of a rail car to cover the rest of his team. His missile box deployed and swung up into position over his left shoulder. He activated his RSTA mast, which rose out of its housing four meters into the air to scan the electronic ether for hostiles. He immediately used two of his ten short range surveillance drones to establish a roving perimeter 100 meters out. The 2 inch drones deployed with a near silent buzzing from his left arm.

Behind and around him, the eleven remaining mechs of ODA 326 came in for a landing among the train cars, and that’s when they suffered their only casualty. There was an explosion 90 meters to Captain Dix’s left. He turned to look, but a line of rail cars blocked his view.

“What the @\$% was that? What hit Hirata?” asked Captain Dix. Skinny 9, his junior medical sergeant, was showing off-line.

“I don’t think it was hostile fire sir,” reported his ADC. “I saw him come in for a weird landing and then there was the explosion.”

“Scan for hostiles and establish a perimeter around him. Move!”

Eleven humanoid, heavily armed robots raced at high speed to form a perimeter around Skinny 9, which lay crumpled in a smoldering heap against a train car. Each bi-pedal mech was just under two meters high and weighed roughly 150 kilos. They were armed with a variety of 7.62mm battle rifles, precision sniper rifles, or light machine guns. Captain Dix’s weapons sergeants each sported a support arm jutting from the mechs’ waists, mounting a minigun or 40mm auto-launcher on a pintle mount.

Heavy weapons pods pivoted back and forth over their left shoulders scanning for targets. Half sported four pre-packaged AT rounds like Skinny 1, the other half a combined high-energy laser (HEL) / .223 LMG weapons station. Conformal battery packs lined their limbs and lower backs. Sensor nodes dotted their heads, which had sloped, smooth tops that swept down to their shoulders and had smoke grenade clusters on the edges.



Mini drones formed a protective layer over the group. Active, adaptive camouflage flickered across their metamaterial bodies, matching their colors to the terrain. Small SF Patches and American flags were etched into their arms.

“Sgt. Hirata, report! What happened?” Captain Dix stood over the remains of Skinny 9, looking at the twisted metal of Sgt. Hirata’s ROAR unit.

“I’m dead sir. I came down in between these two trains, and hit an unexpected thermal. It stood me up and before I could recover, tipped me into this train. I think the impact detonated one of my Carl Gustav rounds.” Captain Dix saw the jagged metal and exposed electronics where the rocket pod used to be and realized Sgt. Hirata was right.

“OK, Sgt. Hirata, what’s done is done. Report to Zeus and give us an extra pair of eyes. Everyone else form up. We’re moving out.”

“Yes sir. Sorry. Sir.” With that Sgt. Hirata powered down his Remote Operated Assault Robot (ROAR) and hit the door release on his flight control station. The remaining eleven ROARs formed into two groups and stacked up behind a series of rail cars, ready to move out to secure the Embassy.

“Colonel Moore, at phase line Red. Permission to engage,” reported Captain Dix.

“Permission granted. Move out.” With that Captain Dix made the forward motion with his hand and two stacks of combat robots in tight CQB formations advanced out of the rail yard.

#

From the skybox, Colonel Moore watched the ninth ROAR control station door open as the rest of the team advanced across the riverfront boulevard on the huge screens in front of him, sweeping their weapons left and right as they went.

Sgt. Hirata stepped out of his control station and punched the door in frustration. Eleven more stations lay in a line adjacent to him, with another set of twelve behind them, which were used for dual missions, or as backups for single team missions like today.

The building they were in was known as the Vault. It was a huge, warehouse sized operations center in the most secure portion of Ft. Bragg. There were two others in the world just like it, one at Ft. Campbell in Kentucky, and another in Norfolk, Virginia. Between them, JSOC could deploy up to six ODA teams using ROAR mechs, although no mission had ever used more than two.

The ROARs were the logical evolution from the TALOS series armored suits. Removing the operator entirely eliminated the threat of combat deaths on the most dangerous missions, and allowed for humanoid operators to be deployed in previously unimaginable ways. DoD mandated a human always have a finger on the trigger, hence the ROAR’s remote control like a



UAV. But otherwise the ROAR design allowed for more weapons, more armor, more sensors, greater situational awareness, and the ability to operate at greater extremes.

ROARs could be deployed ballistically via CMMs from ships, submarines, or ground units – launched thousands of kilometers in minutes. They could be mounted on torpedoes covertly launched hundreds of kilometers away. They had been dropped from B-21s. They were sent overland in arctic climates too cold for human survival. Once they were even sent in a sealed cargo container by ship, patiently sitting in their CONEX box for two months, twenty deep in the hold until their CONEX was unloaded, placed on a tractor trailer, and driven directly into their target by an unknowing adversary.

Sgt. Hirata took off at a jog to head over to the Zeus operations room. They had been preparing the battlefield for the last few hours and were busy unleashing their own version of hell.

#

The Zeus team was run by a full bird Colonel. Colonel Dos Santos wore a patch with a giant lightning bolt on her left shoulder indicative of the 217<sup>th</sup> special mission unit, known as ‘The Olympians.’ Direct commissioned out of Silicon Valley two years before, she had matching PhDs in computer network design and cognitive psychology. She had built two different computers which had passed the Turing test – the first one, after passing the test, had been pitted against the second. Right now, her and her team of 120 system engineers, access operators, intelligence analysts, linguists, and supercomputers, were taking over Kinshasa.

When the coup broke in Kinshasa, Zeus had gone to work. Target development network analysts using automated scanning tools mapped the Congolese Internet and cell phone networks. From there they drilled down to connected devices, routers and wi-fi networks, scanning for vulnerabilities, and running massive cracking libraries against every end point to compromise as many devices as possible. They were very successful.

By 2050, the average ratio for any given urban area was approximately 40 connected devices for every person. This included phones, computers, wearable tech, cars, all the IOT devices, security cameras, VR glasses, RFID transmitters, and innumerable other connected devices which permeated the everyday world. Kinshasa was a target rich ecosystem of roughly 800,000,000 connected devices. Zeus compromised them by the tens of millions.

The F-35’s flying CAP over Kinshasa reinforced Zeus’s efforts. In addition to world class sensor payloads, each F-35 carried two drop tanks filled with swarm bots – tiny drones which operated as a cooperative, programmable mesh network. Each tank held 50,000 bots. Without anyone in the city knowing it, 200,000 tiny bots settled over the commercial and government district on rooftops and in trees, cataloging wireless networks, acting as cell site emulators, and measuring data volume through local networks to help with crowd analysis.



The Zeus team focused active SIGINT collection on a ten-block radius around the embassy. Linguists targeted hot phones, flipping through conversations in French, Lingala, and Swahili, and identifying members of the gangs attacking the embassy. They tagged these phones and from there expanded through phone lists and cell records to other phones of interest. They then jumped to social media, mapping and cross referencing friends lists with cell phone contacts.

By the time TF Skinny landed in the rail yard, Zeus had a god-like view of the city, and had pwned over 350,000,000 devices. They knew 90% of everyone surrounding the embassy by name, including where they lived, their families, and where they were standing at that very moment. Linguists listened in on their phone calls in real time.

Zeus inserted fake news and VR videos into the social stream, claiming that there were armed gangs near the rail yard slaughtering everyone, and then boosted the signal by resending the messages to targeted individuals, driving crowds away. That had effectively cleared the LZ for TF Skinny. With the ODA moving out, Zeus now targeted the armed gangs attacking the embassy itself.

#

The fight to clear the perimeter was short and lopsided. Just as the ODA moved out, all the attackers' cell phones received text messages. Some were from superiors ordering retreats, while others warned the recipients were targeted for death. Mass confusion resulted just as the ODA hit phase line green and started dropping targets.

"Got the messages ready Lt?" Asked a major in Zeus's effects section.

"Yes sir, we have messages ready to go in French and local languages."

"Ok, make it happen."

"Copy that sir."

*'Put an always on live mic in every house' they said.* He chuckled to himself as he hit the send button and looked up to watch the results. *'What could go wrong' they said.*

All across Kinshasa, dots lit up in homes and cafes. They started talking to surprised occupants in French and local dialects.

[In French] "Warning! Military action is underway by United States military personnel in Kinshasa. Stay indoors. Do not engage them or get in their way. Warning!..." People looked at the dots in fear. They started texting friends to get off the streets.

The ROARs made short work of the gangs surrounding the Embassy. Most fled, those who stood and fought, died. Two of the ROARs took hits from small arms fire, which didn't even scratch the meta-materials of the mechs, but would have resulted in serious casualties if they had been human.





Captain Dix left teams of two ROARs on the back and front corners of the embassy to protect the perimeter, and he, his ADC, and remaining medical sergeant entered the front gate, hastily opened by two Marines in TALOS-V gear. Each perimeter team had their own swarms of mini-drones roaming out and keeping watch.

Waiting for Captain Dix in the compound on the front driveway of the embassy was the Regional Security Officer and his number two, both clad in old-style body armor and ballistic helmets, and pair of last generation NVGs on their heads. Captain Dix clanked up to them and reported through the voice speakers.

"I'm Skinny 1, Captain Dix. You must be the RSO." (Captain Dix had the RSO's personnel profile picture up on his screen for comparison purposes.) He held out his arm to shake hands. The RSO, who had never seen a ROAR before, was staring at him a little slack jawed. "Don't worry sir, the computer recognizes I'm trying to shake hands so limits the amount of force I can exert."

With some hesitation, the RSO held out his hand and they shook. "I'm Jose Montoya, RSO. This is my 2<sup>nd</sup> in command, Steve Green. Captain Henderson, MSG detachment commander, is up on the roof directing the snipers. Welcome to Kinshasa." He paused and looked the ROAR up and down. "No offense, but what the @\$% are you?"

"We're remote operated combat mechs. I'm sitting in Ft. Bragg right now. My team are Special Forces operators trained to use mechanical combat robots."

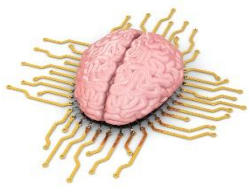
"That's seriously bad@\$%." Captain Dix nodded his 'head' in agreement. "How did you get here so fast, we were told it would be another eight hours until we got help – then you popped up on our net, seemingly overhead."

"That's classified actually, can't go there. But the good news is we'll stay until the FAST team gets here with the quads and then we can all pack up and go home." He looked at the wall of the Embassy, pock marked with bullet holes. "Looks like you had a heck of a fight. Can you confirm the Ambassador is OK?"

"Yes, he is sealed in the safe room with some of the marines and the rest of the staff and dependents." He showed Captain Dix a bio-sensor reading on his arm tablet. Captain Dix scanned it and confirmed it belonged to the Ambassador. "The rest of us are out here on the perimeter or on the roof. We have three wounded and no dead."

"Very good. My medic here can assist in treating the wounded." The RSO looked in skepticism at the hulking robot to his right. "My ADC will stay with you. I'm going to introduce myself to the Ambassador to put eyes on. Please let them know I'm headed inside. I'll be back."

The hulking robot to the left made a noise that sounded suspiciously like a smothered laugh. The RSO stared at Captain Dix's back as the massive humanoid clanked to the front door of the



embassy with a smoothness in the walk that almost made it look natural. The RSO leaned over to his number two and said *sotto voce*.

“He didn’t just go there, did he?”

“He did boss. He totally did.” Said Steve with a grin. The robot to the left let out another smothered laugh and quickly turned away when the RSO shot him a dirty look. Harry looked at the medic, standing there impassively. “Let’s go.”

#

With the embassy secured the rest of the mission was a babysitting gig. Captain Dix put his two snipers on the roof of the embassy, and they took care of the few probes which didn’t heed warnings from Zeus. Other than the occasional boom of a .338, the entire sector quieted.

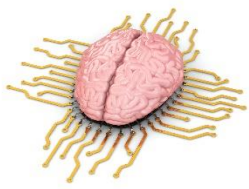
The immediate threat at bay, Zeus sought to manage the crowds still roaming the city and see what they could do to stem the wider violence. It was a stretch of their mission orders, but Colonel Dos Santos argued it up the chain that keeping the violence in the city subdued was in direct support of the NEO. After considerable debate within JSOC, AFRICOM, and the NSC, she was given approval to continue full scale effects operations across the entire city.

Her compromise total was now over 500 million devices and she used them to play the city like a conductor directs an orchestra.

The team’s most effective tool was social crowd tracking. They could tell where crowds were based on cell pings and security cameras. Feeds from thousands of compromised cameras scanned the crowds and the super computers with their sophisticated algorithms measured their hostility by things like male-to-female ratios, facial recognition of emotions, and ratios of weapons to people. That was merged with real-time monitoring of social media and text messaging, which scored each transaction on a positive-to-negative scale.

Together, the team could visualize where crowds were benign or potentially violent. The computers mapped social threads and rated their impact and stickiness. Good threads were amplified. Negative threads were choked off. Zeus DDOSed the opposing influence campaigns they saw flowing across the networks.

Zeus patiently worked to separate rival gangs, clearly identifiable by violence fault lines on geospatial overlays. On a few occasions, they created cellular dead zones to separate factions, sometimes with the help of the F-35s conducting HEL kinetic strikes to fry cell sites. In addition, Zeus personnel contacted leaders of over two dozen rival gangs, and offered them and their men small payments via MPesa if they would stand down. Those who agreed received the money on their phones within minutes.



Word spread through the city somehow the Americans knew everything that was going on. More and more people felt it was safer to head indoors, where they were left alone, except for their dots which kept telling them everything was going to be OK.

By morning the city was relatively calm. Colonel Dos Santos and her team had successfully shut down a burgeoning genocide within six hours, and never fired a shot. (Two months later she received a DSC for her efforts in a classified ceremony, and multiple members of her team also received commendations.)

#

Not long after dawn, the quad rotors landed a few blocks away on the main traffic circle, designated as the evac LZ. The RSO and marines ferried the Ambassador, staff, and dependents in light armored vehicles the few blocks to the quads for evac. It took four trips. The entire time, the ROARs stood sentry along the route. With dawn the locals were drawn outside by curiosity. Despite repeated warnings, the crowds inched closer. Weapons weren't visible, but Captain Dix was getting nervous they could be swamped by numbers alone.

"Zeus, this is Skinny 1. Any suggestions?"

"Well Captain, the crowds are all trending friendly, I don't see indications of hostile intent. How about we try something different as a goodwill gesture?"

"What do you have in mind Colonel?" She told him and LTC Moore about the idea one of her one PFCs had suggested from the cultural team.

"Heh. That might work." Responded Captain Dix with a smile on his face. "Colonel Moore, what do you think?"

LTC Moore sat there in the skybox with a cup of coffee and thought about it for a moment. He shrugged to nobody in particular.

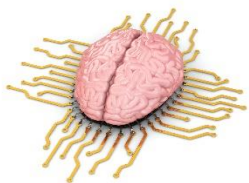
"Why not, the Gods of Olympus haven't been wrong so far."

"Right then Captain. How about a little music until your team departs?" Captain Dix warned his team what was coming.

On people's VR screens throughout the crowds, a vid appeared and music started blaring. The same music erupted from the speakers on the ROARs. The crowds, shocked at first, quickly realized what was going on. Smiles appeared and some people started dancing. A few of the ROARs waved to the crowds or gave thumbs up.

Zeus was piping videos from the PFC's Nigerian Music Video app on his Roku.

As TF Skinny fell back to the last aircraft and they climbed up the quad's ramp, hundreds of recorders captured video of the top secret American robots before a storm of dust blown up by the rotor blades caused people to turn away to shield themselves. Later, some of the people



Science Fiction:  
Visioning the Future of Warfare 2030-2050  
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who watched the vids could swear they heard music in the background, and argued the second to last robot up the ramp was moving in a way that looked suspiciously like the Macarena.

JSOC had no comment.



Mike Matson is a writer in Louisville, Kentucky, and has a deep interest in national security and cyber matters. His fictional writing primarily focuses on military and intelligence-oriented science fiction. In addition to Louisville, Kentucky, and Washington, DC, he has lived, studied, and worked in Brussels, Belgium, and Tallinn, Estonia. He holds a B.A. in International Studies from The American University and a M.S. in Strategic Intelligence from the National Intelligence University, both in Washington, DC. He can be found

on Twitter at [@Mike40245](https://twitter.com/Mike40245).



**A Night on the Town**  
**By Alastair Millar**

Lieutenant Charlie Navarro was a happier man than he'd expected to be. Halfway through the four hour journey from Fort Schwarzkopf, outside Kansas City, to their target in South America, he leaned back in his seat and stretched, looking around the pressurized compartment; Jack 'Doc' Martin and Mel Kaczynsky were nodding, half asleep, and his other two sergeants, Jackie Cole and Stan Mueller, were busy with some kind of complicated card and dice game. Sue Shaw, his commtech, was fiddling with her kit, while Annie Mayes, the bioware specialist, was writing yet another one of those long letters to her twin brother out in the Middle East somewhere.

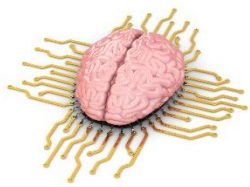
The screen in front was showing the wagons in the main bay behind them; inside, the ROCs would be swaying gently in their cradles while the capsule sped silently through the vac tube. It was, he thought, a very civilized way to deploy.

\* \* \*

It hadn't looked like the day was going to start out so well. The briefing alarm had gone off at 1300, and that was bad news. Navarro was due to start leave the next day, and whatever had hit the fan this time might well end up forcing him to postpone. *And that*, he thought, *will really screw up the weekend I had planned with Alice. Best not to let her down if I want her to stick around!* His girlfriend was a pretty, curly-haired blonde, and he still couldn't quite believe that she'd been interested in a grunt like him.

By the time Captain Andersen strode into the Pit at dead on 1330, trailed by what looked like a couple of staff weenies, everyone was there, uniforms in the front row, ROC jocks in their sweats filling up the spaces behind. Andersen was a no-nonsense type, not at home to small talk.

"Okay people, listen up! I don't know if you saw the news last night, but yesterday afternoon there were coordinated terrorist strikes on more than 20 US trade missions and embassy compounds, as well as properties belonging to more than 50 major American corporations, across the whole of South America. In every case unmanned drones set up as flying shrapnel



bombs were flown into civilian buildings. Best guess so far is 128 dead and more than 300 wounded.

In three cases the drones were intercepted by passive defenses and large fragments were recovered. We're not making that public, it counts as classified, so keep your mouths shut about it! The on-board systems we pulled out of each one showed they'd all been launched locally, but *also* contained old GPS data from what was probably systems testing during manufacture – which means the brains have worked out exactly where they were put together.

We have claims of responsibility online and to the media from the Global Anti-Capitalist Corps. Intel has them as a fringe semi-anarchist group with a wealth redistribution, poverty reduction and anti-corruption platform. They've staged riots and thrown Molotovs before, but this a step up for them.

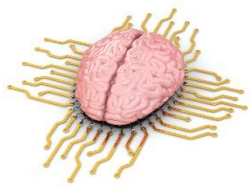
Orders have come down: this needs an immediate response. The brass want the manufacturing site taken out, and anyone still there rendered back to the US. We're sending a message, which is that if you mess with us, we're coming to get you, and we're coming fast and hard.

Make no mistake, we absolutely do not want to be making martyrs here, people; we want warm bodies we can put on trial and in front of the cameras as soon as possible. We have got to get the upper hand in the infosphere or they're gonna roll right over us.

Okay, these are satellite images of the location – looks like a four story building in the barrio on the western edge of Nuevo Medellin. There's no effective local law enforcement or government presence, because the cartels have the area sewn up. To maintain operational security we're not telling the locals that we're coming, either, so this is black.

Kickoff is 1600. You'll deploy by tube to a freight terminal here, 6 miles to the south east. The owners are expecting a high value delivery and have no idea that you're it. Briggs, you'll take 1<sup>st</sup> platoon to arrive first, then secure the terminal to guarantee exfil and act as reserve. Navarro, you'll take 2<sup>nd</sup> platoon, arriving 10 minutes later, then move out along this route to the target, get the job done and then haul @\$ back to the exfil point for immediate recall. There'll be time for questions later, but this is how I want the job done..."





\* \* \*

Fort Schwarzkopf was sited to take advantage of the vac tube interchange between the Shawnee Line from Chicago to San Antonio and the Central from San Francisco to Norfolk. Starting here, specially converted capsules could carry anything the Army needed through the tube network to any major city or base in the continental U.S. within just a couple of hours. Once they were in the system, the capsules were virtually impossible to distinguish from regular freight for anyone, be they friend, foe or journalist, let alone to intercept. Second Platoon was routed down through Dallas, Austin and San Antonio to join the Pan-American Trunk though, which could reach speeds of 1,100 mph, and as they were switched through the network, neither the line operators nor any government agencies had any idea of what was moving through the gathering darkness.

Half an hour out of Nuevo Medellin, 2<sup>nd</sup> Platoon started to gear up, pulling gel-filled, graphene-based body armor over their chemo-, bio-, rad- and flame-proof nanofiber combat fatigues. They'd opted for the gray and black 'urban' OCP; thanks to the nanotech the battledress was color configurable, but there wasn't much point using standard greens in the middle of a city.

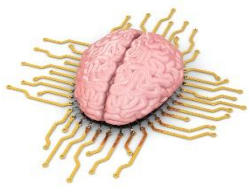
Navarro snapped the visor down on his full-head helmet, and ran through the optics, audio and video recording checks, before moving on to his weapon and making sure the feeds and magazines for both the regular and stun ammo were clear. *All good*, he thought, *ready to rock and roll*.

\* \* \*

The capsule came into the freight depot in a gentle glide. They came out on point, because if the area hadn't already been secured in the 10 minutes since 1<sup>st</sup> Platoon had arrived, this was when it would get lively. As it was, they were greeted by one of Briggs' sergeants.

"All ready sir," he said, saluting Navarro. "Lieutenant's regards, he's locking down the site's own staff. Perimeter's secure, so you can go ahead and offload your wagons".

"Thanks. Okay Shaw, get 'em out."



The capsule's main bay doors were already rolling up, and the electric engines of the five vehicles inside were running. Shaw waved, and they moved forward onto the dock, and down into the large, empty square of space in front, between the stacked containers, where 1<sup>st</sup> platoon's trucks were already lined up.

From the dock Navarro could see the angular bodies of 1<sup>st</sup> Platoon's inner cordon of Remote Operated Combatants, bipedal metal frames glistening in the damp floodlit air. It was cheaper and quicker to build a ROC than to train an infantryman, and the kids back in Kansas who were piloting them didn't need to be kept in the peak physical condition of a front line soldier – they just needed good reflexes and the ability to be plugged into their consoles for 8 hours at a time. With shifts for the pilots, ROCs could be kept going on their internal batteries for 72 hours, didn't need to stop to eat or sleep, were harder to disable than a flesh and blood trooper, and were good for morale back home – after all, they were easily replaceable and kept the body bag count low. The four-armed H-ROC variant was a heavy weapon platform; with the two mid-limbs holding a heavy machine gun and the upper limbs mounting a shotgun/flamethrower and a grenade launcher, they brought some serious firepower to the party.

On the other hand, you still needed people to make the tactical and ethical decisions on the ground and keep things moving, so each of Navarro's squads was made up of two teams of four ROCs, and an H-ROC, but led by a human sergeant. Right now, each of those sergeants was checking his 6-wheeler combat wagon and the ROCs inside, while Shaw had her bag of tricks out and was running comms checks on every unit.

Mayes had the side of the command wagon open. She was taking out one of her 'pets' - it looked suspiciously like a hawk at first glance, but the cable running from the back of its head to her hand-held was enough to show it was bioware. Even plugged in and with silver eyes, they were hard to tell from the real thing, but that was what happened when you grew natural muscle and tissue over a lightweight graphene-based frame.

"What are we going with?" he asked.

"Standard two-up," she said, meaning the bird would both drop the recon microplatforms and then hover over the target area, acting as overwatch and as a conduit for the satellite link to the ROCs and the team comms. She pointed at the canisters on its legs: "I've packaged a type



three swarm. Co-ords are in, it'll be on station in 10. Give me 30 and we'll have full 3D of the whole building."

As she spoke, she unplugged the wire and threw the construct into the sky. Its wings blurred and it hovered briefly, before rising smoothly and heading north-west into the darkness.

Navarro flicked on his radio. "Okay people, bird in the air, we move out in 15".

\* \* \*

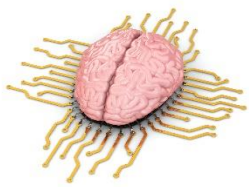
Ten minutes later, the hawk drifted silently eight kilometers away. The canisters on its legs opened, and something like a fine mist dropped towards the ground. The thousands of almost microscopic, insectile drones woke as they fell, aware of each other and the hawk above them, spreading out as their autonomous systems came online. By the time they were at the level of the target building they'd booted up search patterns and were seeking open windows, the gaps beneath doors, ventilation ducts... any way at all to get inside. Micromapping their environment as they went, sharing and merging data, seeking out heat sources, their molecular circuitry was hardened against interference, they neither knew nor cared that when the operation was over a kill command would render them inert, slightly metallic dust.

By the time the wagons had left the almost empty expressway and turned onto the unsurfaced roads of the barrio, the whole team had full three dimensional maps of the target building, with live updates showing sources of body heat. The driver ROCs were using streamed satellite info to get them on site and around any unexpected obstacles.

In the command vehicle, Navarro looked over Mayes' shoulder at the incoming data and nodded.

~ "This is Alpha One to all units. We're showing nothing on the roof, probable six hostiles to secure. We'll go with entry plan one, repeat, entry plan one. Mission is to detain and exfiltrate all present, to detain and exfiltrate all present. Red squad, entry top floor left, LOE top and roof, leave heavy with Blue One. Acknowledge."

~ "Red One, acknowledge, top left entry and roof, heavy to Blue One."



~ “Green squad, entry third floor right, leave heavy with Blue One, acknowledge.”

~ “Green One, acknowledge, third right entry, heavy to Blue One.”

~ “Blue squad, secure the vehicles and main entrance, acknowledge.”

~ “Blue One, acknowledge, perimeter and main entrance with the extra heavies.”

~ “Gold squad with Alpha One, entry level, LOE ground and second floors, acknowledge”.

~ “Gold One, acknowledge, with Alpha One, entry and second levels.”

~ “Alpha One, 30 seconds... Go! Go! Go!”

The five wagons came to a sharp halt on the road in front of the building, spewing ROCs and men. Navarro hit the ground running, and found himself flat against the wall by the glass entrance doors, next to ‘Doc’ Martin. He was vaguely aware of a couple of kids, maybe 10 years old, scooting off the street and up an alleyway. *Too smart to get caught in anything*, he thought, *and who can blame them?*

He took a breath and held up his fingers – 3, 2, 1... and in! The ROCs smashed the glass and were through. At the corners of the building more ROCs were climbing, ribs on their hands and feet creating localized vacuums that let them race up the walls like geckos for entry through upper windows. Two of them had squad sergeants on their backs.

The pair of ‘guards’ asleep in the soft chairs of the lobby were hardly even moving before they were immobilized; the stun rounds’ sabots hadn’t even reached the floor before the zappers hit them, electricity arcing briefly between the metal buttons on their shirts.

Gold squad were already moving towards the stairwell while Navarro put the restrainers on the unconscious sentries and stripped them of their handguns and automatic rifles. *Well*, he thought, *the longs pretty much prove they aren’t law abiding citizens, anyway!*

Martin’s H-ROC had settled in the middle of the lobby facing the door, although the chances of anything getting past Blue squad and the extra H-ROC outside was pretty minimal. From upstairs



he heard the sound of doors slamming, and a single gunshot; then silence. Navarro wasn't overly worried – the breathers had the floor plans on their HUDs, and faint augmented reality overlay lines based on the recon data traced all the walls, doors and windows for them. They even knew where the charlies were. Who needed night vision when a swarm of multiple wavelength eyes could show you everything more clearly anyway?

~ “Gold One, second floor secure, bringing three charlies down.”

~ “Alpha One, acknowledged. Everything OK?”

~ “Yeah one of them got a shot off, chipped the paint on Gold Three. No biggie.”

~ “Roger that. Bring ‘em down Doc, all clear here.”

~ “Red One, top floor and roof secure. El-Tee, you’re going to want to come up and look at this, probably bring an H-ROC with you.”

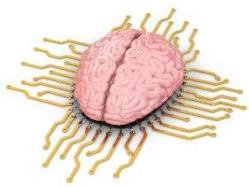
~ “Copy Red One, hold there, I’ll bring Gold 10 up with me when Doc’s got his team in the lobby.”

~ “Green One, third floor clear, one charlie detained. Green Five’s bringing him down the stairwell. We got an assembly area here, some drones on workbenches and explosives.”

~ “Roger Green One, make sure your recordings are clean. We’ll want the evidence Jackie. Hold there for now.”

At Fort Schwarzkopf, Bobbi-Jo Jones listened to the radio chatter and sighed in her cubicle. The jock for H-ROC Blue 10, she was bored; after all, all she’d had to do so far was get her ‘bot on a truck, do a comm check, jump off the truck, and then stand around looking up and down the street. She’d been a champion combat gamer before being recruited, and then spent 2 years working up from the regular ROCs to her own heavy. Hours in VR harness doing sims had honed already fast reflexes, but at times like this she wondered if the job was really all it was cracked up to be.

Navarro looked at his watch. *Four minutes to secure the building. Not bad, not bad at all! Now just got to check on Jackie’s workshop, make sure we take some bits and pieces with us for the spooks and the press, then see whatever Mel’s come up with on the top floor. And why the heck does he want me haul an H-ROC up there?*



Less than ten minutes later, he found out. The whole of the open plan, top floor had been converted into a grow lab, with rows of planters holding stubby blue plants beneath UV lights and a sprinkler system.

“Ah hell, is that what I think it is, Mel?”

“Damn straight. Fresh grown Dewspice, all ready to be cropped and processed.”

Dewspice was one of the newer, incredibly potent, highly addictive hallucinogens, created by biografting and genetically modifying cannabis plants; the dealers loved it because it was impossible to overdose with, as the body just got rid of anything it couldn't process. The haul here would be worth several hundred thousand dollars on the street, even locally. *And a hell of a lot more if they ship north of the Rio Grande!*

Navarro swore softly. “OK, got your helmet sealed Mel? Gold Ten, roast 'em – low burn, don't want the whole building in flames.”

“Yes sir!” said the synthesized voice, and as the H-ROC started playing its flamethrower up and down the rows of tables Navarro began to think.

*This was probably how they paid for all the gear they used in their attacks. But they'd have to be in bed with the local cartel, wouldn't they, or they'd have been run out. Or worse. So why weren't there more guards? Then he realized: Those kids outside! They were cartel spotters! But in that case...*

The commnet crackled to life, Mayes' voice sounding urgent.

~ “Alpha Three, I have contacts on the roof south-west of target, possibly armed.”

~ “Blue Two, I have around a dozen contacts incoming from the west, moving tactically down the sides of the street.”

~ “Blue Three, movement in upper windows south-west.”

And then all hell broke loose.





The RPG was fired from the nearby roof at Gold squad's wagon, with a flight distance of just 55m. Even so, the sensors on the two closest wagons picked it up on launch, and the directed energy pulses from both hit the projectile just 3m from the vehicles. The explosion tossed the nearest ROCs back on their butts, but the trucks were hardly scratched.

Upstairs, the windows all shattered at once, and it was only their body armor that stopped Navarro and Kaczynsky from being shredded by the flying glass. They were both thrown hard to the ground as a chatter of automatic weapon fire started up in the street below.

~ "Alpha One, code red! Code red! Return fire!"

Back in Kansas City, Bobbi-Jo Jones saw the huge flash, and saw the damage indicators flickering from green to yellow. Mayes' warning about the roof had had her looking that way before the RPG launched, and when Navarro's command came in, reflex took over. Her unit raised an upper arm, and as she squeezed the trigger on her VR handset 3,000 miles away, three powered grenades vaporized the source of the incoming fire. Now *this* was more like it!

~ "Blue Ten, contacts on roof neutralized."

The lieutenant pushed himself up and crawled to the window sill. He felt rather than saw Kaczynsky coming up further down the room, but then he saw motion and the two of them were sending live fire into the upper windows of one of the neighboring buildings on the other side of the street. The movement stopped.

Gold's ROCs were spreading out from the front doors, and taking down the hostiles who'd been coming down the road. Blue's were back on their feet and returning fire. Being almost immune to small arms, ROCs could be more cavalier about coming out of cover, and not being there physically tended to make the jocks a little more... enthusiastic than their officers anyway.

It was over within 3 minutes; the cartel had obviously not expected to be running into anything more serious than a local police unit, and had been completely outclassed by what they'd really come up against. It was nothing short of a massacre.



~ “Alpha One, Gold One get the charlies loaded, one per wagon, two in the command truck. Blue squad, anything moves, down it!”

~ “Alpha Three, confirm kill for swarm please One.”

~ “Alpha One confirms.”

All over the building the nanodrones went dead as power surged through their delicate circuits, turning them into tiny lumps of fused circuitry. The augmented overlays in the HUDs went out.

~ “Alpha One, let’s mount up and get going before we get more visitors. Time to go home, folks.”

\* \* \*

Less than 90 minutes on the ground in South America, and the platoon was back in the vac tube. By 3am the prisoners had been handed over and the debriefs began. By 9am, Lt. Charlie Navarro was sitting with his girlfriend in their favorite diner, ordering breakfast.

“Charlie, you looked wrecked. What have you been *doing* with yourself?”

“Oh you know, the usual,” he replied with a smile.

“Riiiiight,” she said, eyes sparkling. “Out on the town on a Friday night without me again huh?”

He laughed.

“Yeah, something like that!”



Alastair Millar graduated from the UCL Institute of Archaeology in London, and works as a specialist translator in the field of cultural heritage. A British expatriate with dual Czech citizenship, he has lived in Central Europe for over 20 years, allowing him to indulge his interest in geopolitics and current affairs from up close. Married with two adult children, he is a political independent who believes that travel broadens the mind, and wishes that more people would learn to think for themselves.



**PYONGYANG STYLE: The Second Korean War**  
**By Rudy Toth**

**PRELUDE**

The Second Korean War began by accident on Monday 16 April 2040, its origins based on personal revenge. North Korean Special Forces General Yun Kong-hum – a favorite of the 56 yearold dictator Kim Jong-un – was very upset and angry. His mentor General Park together with Park's entire family had been swept up in one of Kim's paranoia-fueled purges and executed. Yun vowed personal vengeance and quietly set about developing a carefully orchestrated plot to overthrow the Kim regime. His plan relied on extreme secrecy and a series of well-told lies – which given the highly paranoid nature of Stalinist North Korea was a necessity. The only way a coup could succeed was through compartmentalization and dissimulation.

From his reinforced bunker in the port city of Wonsan, Yun developed a plot that centered on Kim's latest trip to Beijing to beg for more financial aid to keep North Korea viable. Yun's clique had ties to Chinese intelligence and so had made arrangements to have Kim's plane shot down as soon as it re-entered North Korean airspace. Yun would then use this as a pretext to claim that the current leadership circle of the party and the military were launching a coup and that he – General Yun – was acting in defense of the Kim regime. Yun already had a list of 'traitors' he was going to eliminate by blaming Kim's assassination on them. He would then fill the key posts with his own people and take over as ruler – a move that China's leader President Ping approved since China had had enough of the Kim dynasty.

On the evening of 6 April, Kim's plane crossed the Yellow Sea on the return flight from Beijing. Major Yin Sun-sin was flying one of the five MIG-29s escort planes from the 55<sup>th</sup> Air Fighter Wing out of Sunchon. He was a dedicated and much decorated pilot – and an agent against the regime. After spending time in China on training missions he had been compromised by Chinese intelligence. China had promised to reward his family – or kill them if he didn't go along –for his part in assassinating Kim. He knew he was committing suicide when he armed his vintage but still deadly R-27 heat-seeking missiles as he rapidly closed on Kim's Ilyushin IL-62. Then he fired. Kim's pilots barely had time to notice the 'hostile fire' alarms before the plane exploded at 21:39L over the Yellow Sea just west of Pyongyang. The other escort pilots were at first too stunned to react but then quickly recovered their equilibrium blowing Yin's plane out of the sky. Knowing they would be executed as soon as they landed for allowing Yin to kill the Brilliant Leader, they made the decision to fly to a Chinese air base in Manchuria.

Yun had been monitoring the situation closely and quickly put the next part of his plan into motion. Using his Special Forces communication net, Yun announced that enemies of the party and the military had assassinated Kim and that he – General Yun – was taking steps to 'punish the traitors' – ordering the military to go on alert. Across North Korea, select Special Forces units ironically loyal to both Yun AND Kim began seizing government buildings and arresting people on Yun's list. Everything was going as planned....except Kim wasn't dead.



No one in Yun's clique had noticed when the heavily armored train favored by Kim's late father – Kim Jong-Il – had quietly slipped into China “for repairs”. On impulse fueled by paranoia, Kim Jong-un had decided to take the train home – secretly switching limousines so that the Chinese watched a body-double board the plane. He was notified the moment his Ilyushin was shot down and Yun made his announcements. Kim knew instantly what treachery Yun was up to. Kim had firm reins on both the regular army and the special internal security troops that were the backbone of his dictatorship. He ordered Special Forces communications coming out of Wonsan cut as he mobilized his state security troops. Kim had to move quickly to contain the rebellion and so he gave instructions to his ‘Special Detachment’ of security troops to ‘release the package’. A nuclear tipped Hwasong missile was fired, detonating over Wonsan totally obliterating the city. It made Kim feel sad – not because of the instant deaths of over 300,000 people – but because one of his favorite villas had been there. But in Kim's world there were other villas but only one Kim. Yun himself was safe in his underground bunker, but completely isolated now that the landscape above him was a nuclear desert.

US, South Korean and Japanese civilian and military officials were monitoring the deteriorating situation in North Korea and put their forces on high alert. They watched in stunned disbelief as Kim nuked one of his own major cities. This was one of their nightmare scenarios: a North Korean civil war. It was not only a security crisis but a certain humanitarian disaster with refugees rampaging across the DMZ into South Korea. In China, Ping watched his plans for pacifying North Korea literally going up in smoke and was suddenly afraid for the future.

Kim felt certain he had isolated Yun for now – hopefully killing him if he happened to be above ground during the blast. His bigger problem was quelling the military, the party and the populace. Destroying a major city like Wonsan meant he was losing control signaling personal weakness and loss of face not only to his own people but also to the outside world. There was no way to keep this secret – too many people knew. Kim was drinking heavily now – slamming down \$7,000-a-bottle Patron Lique Tequila. He had no choice, he'd blame Wonsan's destruction on the ‘Running Dog Capitalist Pigs’ otherwise known as the U.S., South Korea and Japan. Kim would launch Operation Chollima – named after the Korean Pegasus – and reunite the Korean Peninsula knowing every one of his generals and admirals would fall in line or else.

## THE ATTACK

The President of the United States together with the Vice President and the Governor of Virginia were at a joint campaign event in Norfolk. It was a great day, good crowd for lots of glad-handing but the Secret Service together with local law enforcement were vigilant as always. While counter-sniper teams with advanced optics provided the traditional protection against sniper fire, patrol drones secured the airspace against terrorist attack from that direction and had created a 3-D holographic diorama projection in a conference area in the mobile HQ. As the politicians took their places, a German shepherd leaped past the rope barriers and up to the stage before the Secret Service could react. The President laughed as did the crowd before the explosion destroyed the platform. The dog had been specially trained by North Korean intelligence to home in the President's scent. Beginning back when the then



future President had become the front runner in the primaries four years ago, North Korean agents had carefully begun obtaining the seat cushions from the chairs the candidate had sat in – sealing them in special plastic bags to preserve the President’s unique ‘essence’. Each time the dog assassins successfully attacked in training, they were well rewarded. Their work was based on dog science developed by the former East German secret police – the Stasi.

Speaker Trent Williams – the first African-American Speaker of the House – had just sat down to watch his St Louis Cardinals play the Chicago Cubs when his Secret Service detail burst into his den, picked him up and told him they were going to White House right away as they ran down the hall carrying him like a human log. Williams protested the treatment until his head of detail told him “Sir, both the President and Vice President were just assassinated in Norfolk – you’re President now”.

Across the U.S., citizens in shock over the double-assassination were then treated to news reports of widespread shootings in malls, churches, synagogues, mosques – a seeming eruption in hate crime. Law enforcement was looking for white shooters, black shooters, and Christian extremists...Muslim extremists....Jewish extremists...the list went on. As people took to the streets in anger and even rioting, they were totally unaware that the perpetrators were really North Korean Special Forces wearing latex masks playing digital recordings of well-known extremists during the attacks to ‘sell the con’. Select units began attacking vital military sites. At the same time, operatives were releasing ‘race-specific’ versions of the Small Pox virus. North Korean scientists had gleaned enough genetic material from exhumed bodies of long dead Small Pox victims the world over to clone the virus. And then, using the same genetic markers that testing companies use to identify nations/regions of origin they built a virus that would only attack those Americans of European or African-American heritage. It would take 12 days for the first Small Pox signs to appear, in both the civilian population and also in the military. This would affect not only the continental U.S. but also Europe and most importantly the Korean Peninsula while not harming anyone of Asian descent. Kim wanted the South Koreans disease-free – then only he would decide who lived or died. Asian-Americans together with Native Americans would be left to tend to the dead and dying on their side.

As panic spread, North Korean hackers spread disinformation, creating chaos in utility systems and across the Internet via disinformation conveyed thru the social media accounts of well-known celebrities and politicians. They even hacked into the major network feeds with a video that looked and sounded like it had been made by the new President Williams – someone most Americans were still relatively unfamiliar with. The actor was made up to look like Williams with the actual voice ‘close enough’ for North Korea’s purpose. In the announcement, the fake President Williams announced that the US was surrendering its sovereignty to the UN and that all military units must comply and all nuclear subs must surface immediately and return to port. This spread even more chaos, hate, protests – with people panicking and survivalists knowing that “this is it!” And then, suddenly, all the lights and power went out over North America.



By 2040, US anti-ballistic missile submarines regularly patrolled the Sea of Japan as part of the system to deter and mitigate any ballistic missile launches from North Korea by destroying those moments after launch. The system depended on detecting and tracking the rocket exhaust. North Korea knew this and set about ways to mitigate. They created a 'mass driver' launch system that used magnetic levitation technology to launch the missiles off the ground. Disguised as a fake theme park with "unfinished" roller coaster rides to serve as launch ramps, Kim's scientists could launch a ballistic missile at speeds up to 1,000 miles an hour before the solid rocket boosters would kick to finish lifting the missile into a ballistic flight path. It moved too high, too far and too fast to be intercepted by the US Navy. Unfortunately for everyone, North Korea fired off not one – but four – nuclear missiles, each one having a specific destination: one over Hawaii, one over North America, one over Europe and one – for good measure – over South America. As the nuclear warheads exploded in space 24 miles above the Earth's surface they blanketed the planet below with an Electro-Magnetic Pulse (EMP) that knocked all electronics, communications and power grids offline. This effectively shut the First World nations down. It was Kim's bet that with chaos reigning in the US homeland, he would be able to take down South Korea.

At 1445L 15 April 2040, the first North Korean 'refugees' began crossing the DMZ into South Korea – close to two hundred thousand people. The western media had been filled with stories of a potential refugee crisis because of the 'North Korean Civil War' and so Kim decided to empty his concentration camps and send the prisoners into South Korea – serving as human shield or fodder – leaving the choice to fire or not on the South Koreans and the Americans. The Soldiers let the refugees thru after initial searches for weapons or contraband – and occasional North Korean Special Forces personnel hidden in the mix. The UN began hastily throwing together tent cities while the South Korean Government relocated to the emergency capital of Sejong 75 miles south of Seoul. Major concerns for the South Koreans and the Americans was what would happen if the stream became 'unlimited'? They already knew from the refugees themselves that they were all former prisoners. With the EMP crisis having crippled two-thirds of the planet, surely the planet was now in the 'end of days'.

At 0245L 16 April 2040, the North Korean Armed Forces blew across the DMZ in a "win easily or not at all" campaign fueled by the wild propaganda claims that US-South Korean-Japanese coalition had nuked Wonsan. In addition to propaganda, North Korea had given its troops an advanced formulation of amphetamines, steroids and painkillers, before sending them off to attack in armored vehicles as well as on foot in 'human waves'. The drugs were no doubt intended to make up for the lack of logistical support because these first waves didn't know that they were expendable. Something in their backgrounds relegated them to the 'first waves'. In the Soviet Red Army during WWII, most of the soldiers knew why they were in the 'penalty battalions'. They'd done something to offend the Communist regime or their families had. In North Korea, this process began at birth. You were in one three main groups: politically reliable, unreliable or somewhere in between. "Human Wave" was a great way to rid the





Stalinist country of its “internal enemies” while saving its “best troops” for last. It was also a great way to grind down the enemy in the process. And if soldiers dared retreat from a “Human Wave” attack, they were machine gunned by “Blocking Units” stationed directly behind them.

The first several waves resulted in thousands of North Korean, South Korean and US dead – with much allied ammunition expended. With Kim intent on – and really needing to – commit his entire one million man army, the North Koreans gradually forced the US/S. Korean forces to retreat 20 miles on an uneven front from the DMZ. Kim ordered his artillery within range of Seoul to open fire. Some 700 artillery pieces of varying reliability opened fire on the metropolitan area inhabited by 24 million people. More damage came from the sheer panic than the actual artillery barrage – which was instantly answered by counter-battery fire from the South.

Kim knew he couldn’t be tied down fighting for Seoul when the best strategy was to bypass the metropolis and take the rest of the peninsula. He was also counting on the ‘race specific’ Small Pox to being taking effect on the Americans so Kim continued to launch near suicidal raids. He correctly anticipated that the US would rapidly gain air dominance – so he sent virtually his entire air force into combat versus having them destroyed on the ground. For the first time, the North Koreans were making use of holographic projections to draw fire. It was the same with his Navy which he launched on suicide runs. The combined task force of US-South Korean-Japanese ships would destroy his fleet, so he launched missiles at Japan to create chaos and confusion – particularly with nerve agent. He also launched his ‘suicide subs’ – which were a cruel joke on the sailors who piloted them. In training, young sailors were led to believe that they and their midget subs would creep up under American ships, attach a mine and then leave. In reality, once they pulled the ‘detach’ lever, their entire midget submarine would explode. So when people wondered how North Korea got their sailors to volunteer for suicide missions the answer was simple: they lied to them!

Kim was careful with his nukes. He desperately wanted to take the South Korean industrial sector intact and had no desire to destroy Samsung, LG, Hyundai or any other organization. In fact, that was his ‘solution’ to the North Korean economic crisis. He would take the South relatively intact, put northerners in charge of the now state-owned conglomerates and do business with China and Russian who should now be grateful for his crippling of the US. Of course this didn’t preclude his using battlefield nukes, which Kim would deploy once he had US and South Korean forces bottled up. The best of the best of his troops – including his ever reliable state security troops and Special Forces units had everything – including contraband or copied western technology – such as advanced aerial drones for painting the night-time battlefield in infrared light, robotic exoskeletons, advanced healing nanites and multi-spectral eye and hearing implants. Unlike the Allies, Kim held all this in reserve for the “mopping up” operations once the enemy was exhausted because he just didn’t have the industrial capacity to arm and sustain his entire army with this advanced technology.



## U.S. – SOUTH KOREAN-JAPANESE RESPONSE

Admiral Forrest was in his fortified bunker in Camp Smith on Oahu. Despite all the disruption from the EMP detonations, key communications were fine. In addition to EMP protected communications, the US had gone to Quantum Communications Network relying on the phenomenon of quantum tunneling allowing communications to take place via subspace dimension. Ironically, some of the first work was done by China launching a Quantum Satellite in 2016. In theory, these communications are impossible to break without a “key”. Forrest correctly knew that his mission was to focus on PACOM in general and Korea in particular. Whatever was happening in Hawaii proper or CONUS was up to the White House and Homeland Security. PACOM had its own 3-D holographic display of the Korean Peninsula in a large room. It was such that he and his team could walk through it without worrying about ‘shifting of the pieces’ as in the old-time rock drills. In other rooms, they could immerse themselves in virtual reality displays of the actual battlefield – so no more screw-ups because the rear echelon doesn’t know exactly what’s really going on.

Forrest was quickly in a 3-D holographic “conference call” with President Williams. It was like they were both in the same room together. Williams’ background was fortuitous for a “sudden” Commander-in-Chief. As a young Soldier in his 20s, he’d fought in Operation Iraqi Freedom. That meant while he wouldn’t be trigger-happy because he knew exactly what human life meant, he also wouldn’t shy from a fight. From what Forrest could see, it was time to retaliate and end this thing. The President agreed and told Forrest that he was calling up the Reserves for inevitable post-war occupation. He then told Forrest to move out...while he the President had a country to put back together after North Korea’s domestic attacks.

Within moments of North Korea’s Air-Land-Sea attack, both the USAF and NAVAIR had begun to engage. As Kim had correctly surmised, there was very little North Korea could do in the air, with its best moments reserved for destroying US and South Korean ground assets before being shot out of the sky. Next came the manned and unmanned US bombers, easily destroying North Korean command and control, fortifications, and logistics infrastructure. The Americans also launched a special breed of UAV known as “The Attack of the Angry Birds”. These were small UAVs that would key in – either individually or part of a hive mind – on muzzle flashes from North Korean artillery, tanks, rocket tubes, and mortars. One or more “Angry Birds” would fly straight down the tube and explode – ideally with a round already chambered. The remainder of Kim’s missile capability was quickly demolished – or at best was buried under collapsed concrete – from heavy bombing. Whatever Kim was going to do in missile warfare, he’d already done. Next came the ground game.

Operation Inchon Air Drop had very little to do with either the City of Inchon or the brilliant amphibious landing by General MacArthur in 1950 that had turned the war around during the First Korean War. It did, however, pay homage to the essential strategy: land superior forces behind the bulk of the enemy, cut off their logistics and force them to fight on



reversed fronts until they disintegrated. Using a combination of manned and unmanned vehicles, a total over one million robotic “Combat Spheres” would be dropped behind the current North Korean front lines. The military referred to this as “the Attack of the Bowling Balls”. All-terrain spheres modeled after remote controlled soccer balls could operate anywhere. They had a hybrid power plant, contained a variety of ordnance – some were only small arms or cannon caliber ammunition, some directed energy, some were smart mines, others were mortars. There were also the “drone spheres” which were self-sacrificial. They would fill in tank trap or blast crater or help create a ramp or bridge to allow the “killer spheres” to advance.

What Stalinists like Kim did with their “Human Wave” assaults, the US did with robotic spheres (The Robotic Wave Assault). They were parachute dropped ideally at night. As soon as the chutes detached they literally hit the ground rolling. They could pass undetected and were able to navigate by GPS, by a hive-based general matrix where the Spheres would move relative to other spheres using quantum communication to avoid conventional electronic jamming. They could also navigate by sight. The Spheres for Korea had loaded into them each night an updated visual package of every fixed structure on the peninsula gleaned from satellite and aerial drones. As soon as they determined ‘where they were’ they could then remember what was next and roll forward. In this case, they began to clear a corridor of land on both sides of the old DMZ in the process eliminating any North Korean hostiles. One group of freshly dropped Spheres began rolling south, after the North Korean invaders engaging them from behind blowing up convoys, blowing off tank treads - cutting off means of escape even as UAVs pummeled them from above. A series of Spheres launched by the US and the South Korean ground forces proceeded with frontal and flanking attacks. These Spheres – together with supporting anti-armor and energy weapons were arrayed in front of the attackers in rows of increasing density. The further the North Koreans attempted to penetrate, the more armor and troops they lost. From the US and South Korean standpoint, they could build 5 or 6 artillery or anti-tank guns for the price of one tank.

Then the “race specific” Small Pox began to kick-in. Most Soldiers had been inoculated monthly with nanites developed jointly by DARPA, USAMRIIDS and the CDC. These were designed for military-civilian applications to release nanozymes with dual biological components. The primary enzyme destroys the mRNA carrier of the genetic recipe for a virus while the secondary identifies the genetic material and destroys its DNA. This activity greatly weakened the Small Pox attack and allowed Soldiers and Army Civilians to begin developing immunity. In CONUS, the race was on to treat infected civilians and to keep the disease from spreading to Europe and Africa. To say that Kim Jong-un and his top leadership were wanted for Crimes Against Humanity was an understatement.

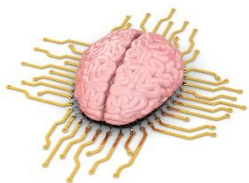


## AFTERMATH

President Ping of China watched as the North Korean attack disintegrated. Whatever advanced robotics and UAVs North Korea did possess were now being deployed to cover Kim's escape. China's relationship with both the US and South Korea had become "severely strained". Ping was concerned as US and South Korean troops finished destroying the North Korean Army while landing troops on the east coast of North Korea north of the old DMZ and south of Wonsan. Deciding to jump before he was pushed, Ping ordered a mobilization of the PLA Army. The US, South Korean and Chinese leaders "met" via 3D holographic conference – as if they were in the same room. As President Williams and South Korean President Rhee listened, Ping informed them of China's intent to occupy a line that ran roughly from Nampo on the west coast to Wonsan. Everything north of that line would become part of a "protectorate" under Chinese administration for the next 99-years. While not expressing it during the holographic conference, Ping's goal was to do with this protectorate what the British had done with Hong Kong – create a hybrid state. The PLA would disarm what remained of the North Korean Armed Forces – taking away any heavy equipment and combat aircraft still in existence. The North's Army would be reduced to a paramilitary police force, while survivors of the Navy and Air Force would be folded into the Chinese Coast Guard or the border police. China would directly control the inter-Korean border, but post no combat troops there. A group of 5 pliable North Korean generals tightly monitored by Beijing would rule out of Pyongyang. South of "the line", South Korea was now inheriting new territory and 7 million new people – out of North Korea's original population of 24 million.

Williams and Rhee were silent. Williams knew that as a Korean, Rhee wanted all of Korea – but also knew that absorbing all of those people while facing a hostile China was a non-starter. Ping was offering a good deal that assured that the Republic of Korea would be secure and that Seoul would no longer be directly on the front line. President Williams then asked Ping what had become of Kim. "We're still looking for him; he will be dealt with", Ping responded. Rhee wanted Kim turned over to the Republic but Williams knew that the nominally Communist China wouldn't stand for it. Not only did they not want a Nuremberg-type trial that would reduce Communism to the same level as Nazism, but China owed a debt to the Kim's. During the Chinese Civil War, Kim Il-Sung had sent North Korean troops to help Mao defeat Chiang Kai-shek. So, as with lethal Cambodian madman Pol Pot, Kim would "die" before he could fall into western hands.

At that very moment Kim Jong-un and his wife were fleeing east in a small convoy that also carried the embalmed bodies of his father Kim Jong-Il and his grandfather Kim Il-Sung. Kim had been stunned when the Chinese ambassador had appeared and told him that instead of bailing out North Korea as they had in 1950, China was now occupying territory north of a Nampo-Wonsan line. In response, Kim pulled an automatic pistol and shot both the ambassador and his deputy in the head. His destination now was an underground complex he'd manage to keep secret from everyone outside his inner circle. Inside, he and his wife



together with a small entourage could discreetly hold out for ten years before quietly emerging to sneak off to Switzerland and live in seclusion off of the billions he had embezzled. It was crazy plan – but then crazy was all Kim had left.

The convoy never made Kim's intended destination. It was stopped by a heavily armed Chinese PLA Army roadblock. Kim and his wife were separated from the convoy and taken to face a drumhead court martial board chaired by a North Korean general. Accused of corruption and genocide, the Kim's were found guilty after a four hour trial and executed by firing squad – all on live, holographic television. Their bodies were then burned in a diesel-fueled bon fire along with the bodies of Kim Il-Sung and Kim Jong-Il. All across the former North Korea, people happily burned the Kim portraits while taking reprisals against former party and secret police operatives. General Yun newly freed from his bunker in the ruins of Wonsan was also executed by China – tying up loose ends.

Over 3 trillion dollars in damage had been inflicted on the world economy, even though the EMP effects were less severe or as long-lasting as Kim had hoped. The only happy people were the North Koreans liberated from the dictatorship. Even in the squalor of refugee camps located in either South Korean or the new protectorate, they were already beginning to enjoy an increase in their standard of living they scarcely thought possible. And so ended a war that had lasted 6 weeks and resulted in the deaths of 4 million people including those who didn't survive the Small Pox epidemic.

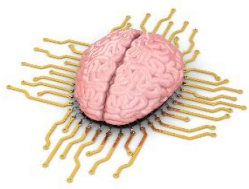


Rudy Toth serves as the Facility Engineering Manager for the U.S. Army Joint Munitions Command (JMC) in Rock Island, Illinois. In this role, he serves as the interface between the JMC, the Rock Island Arsenal Garrison, and at least 17 resident agencies and commands, including the U.S. Army Sustainment Command.

Toth began his federal career as an industrial engineer with the Department of the Army, Production Base Modernization Agency, in 1985, working production support projects. His assignments included Chief of Production Support, Equipment Replacement Branch; Chief of Armament, Chemical Defense Branch; and, Chief of Layaway Branch. From 2002 to 2006, he served as Co-Chairman of the Modernization Program for the Lake City Army Ammunition Plant.

From 2006 to 2010, he was Division Chief of JMC's Facility Engineering, Environmental and Property Division, and served as acting Director, Industrial Support, from July to September 2009.

Toth is a native of Moline, Illinois, and earned a bachelor of arts degree in Physics from Augustana College, Rock Island, Illinois; a bachelor of science in Industrial Engineering from the



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**Sucker Punch!**  
**By Dr. Phil Reiner**

**...DNN NEWS ALERT: December 7, 2037....** “All eyes of the world are focused tonight on the two superpowers amassing forces along the hotly contested Coulee Valley Region. Diplomatic talks between the Orange and Purple leaders have once again broken down as border skirmishes between rebel leaders continue to exacerbate rising tensions in the region. Sources in the area say the new actions by the Orange Allies amounts to nothing short of saber-rattling, almost daring the Purple forces into a fight which they feel they can easily win. Frustrated leaders at the emergency UN Security Council meeting today were quoted as saying “we’ve run out of options.” What those options might be is hard to say, but critics of the Purple regime are quick to point out that this is the sixth time in as many months that they have had to back down from their threats to the Orange leaders. A senior official in the Purple Coalition said, “The simple fact is that the Orange Army is and has been a threat in this region for over six years. They have a force twice as large as ours and more importantly – they know this region and have fought successfully here before...I don’t know what can be done short of the ‘Insanity Option’,” the term coined during the Nuclear Arms Talks held in Geneva earlier this year. Other officials condemn the arms build-up and are calling for a stand-down of both sides, but neither seem willing to compromise at this point. One thing is clear, the region is a tinder box ready to ignite at any moment...This is Correspondent Dumbmore, DNN News at the UN.”

**1600 Hours Dec. 7, 2037: Orange Command Headquarters, 350 km East of Coulee Valley**

Pointing to a map of the Coulee Valley Region, GEN Scarpan gives a final assessment to his commanders, “...this is where the Purple Coalition has landed. They have 6 heavy armor divisions, two here, two here, and two here. Four more are on their way from the southwest. Supplies are being brought in to the South Region. Satellite photos located two squadrons of stealth fighters stationed at the Purple-controlled airbase. Ocean II Command reports six heavy destroyers and two aircraft carriers have turned toward the Northern Seaport, presumably to support operations along the North River. I don’t need to tell you that their airpower is our greatest threat. Their actions in the Dunang proved that point. General Arbiss will now take you through the final plans of our ground strategy.”

GEN Arbiss addresses the staff, “Commanders, our strategy is simple: we will execute operation ‘Orange Crush’ as briefed. We’ve incited riots in the cities along the Southern region to distract the Purple [expletive deleted] and take the focus off actions in the north. Cyber Command reports their teams have already hacked Purple command and control and they have been able to manipulate their new anti-aircraft laser weapons. They are using some sort of distributed computer network to pre-position stockpiles which we have also compromised. Our squadrons are positioned behind us and will begin bombing raids deep to the rear of Purple forces near the valley sometime around 0400. A second attack group is ready at the Northeast



seaport. Submariner Group II is ready to intercept if Purple should try to enter our coastal waters. The ground attack will begin at 0500 hours. We have 12 divisions of heavy armor, fully equipped. Six will enter with Army Group I into the Coulee Valley here and here (pointing to the map). Four will support Group II and swing to the north and west. We will attack through the Coulee valley head on. Group II, supported by long range heavy artillery batteries positioned just North of our main task force, will move in and cut-off rear support. In short gentlemen we're going to cut them off at the knees and [expletives deleted]. Any questions?" "Sir, intelligence reports that Purple has developed some kind of new stealth technology...are you at all concerned about that?" asked COL Bilather. "We've tracked that for years COL *Blather*." intentionally mispronouncing his name. Sooner or later they have to emit and nothing survives hot lead. Any other 'intelligent' questions?"

### **1820 Hours: Purple Strategic Operations Center, 300 km Southeast of the Coulee Valley**

COL Sanders addressing General Albright, leader of the Purple Coalition, "Sir, 'ALI' reports 6 intrusions detected, three nets had to be quarantined." GEN Albright responds, "Thanks, Sanders, standby. I may need you for this briefing..." "Take a seat gentlemen. As you are aware, several Orange armor divisions have crossed the border on the edge of the Coulee Valley Region. As of yet we were not able to determine their full size and strength. We have confirmed that three of our reconnaissance satellites were knocked out 12 days ago. As for the recon flights...well it doesn't take a genius to figure out what happened. They outnumber us two, maybe as much as three to one. We have unmanned stealth vehicles on flight standby. For now we're going to maintain a defensive posture until we can determine their intent."

"Sir, we have reports that Orange Cyber teams were able to breach Big-ALI. Is that true?" one of the commanders asks. Albright responds, "It is, but we were able to confirm that ALI intercepted the intrusions, and quarantined three of the nets before the enemy could react." "Sir, what makes us think we can rely on ALI? We lost control of some of our RADARs this morning." Asked LTG Comonnow. "Sanders, you want to handle that?" Albright said. Sanders stands up, "Yes sir. Ladies and gentlemen, as you may or may not be aware, the Artificial Logistics Intelligence System, or 'Big-ALI' as we call it, is a large, massively parallel quantum computing network containing thousands of individual nodes. The nodes are connected using quantum encrypted channels. If a breach occurs, we know it instantly, and ALI is able to quarantine the 'infection' and can backtrack the source of the intrusion. The nodes that were attacked were identified and ALI went into a forensic mode on that part of the net. It was able to determine the intent of the attack which was to take down our laser weapons – the RADAR sets in particular. We turned the RADARS off to make the hackers think they had succeeded!"

Albright, gravely serious, "Thank you Sanders. Ladies and gentlemen, I will remind you that our strategy will take nerves of steel. You have to be flexible and ready to change operations on a moment's notice. We are going to use detection and deception to lure Orange into a trap – a trap of their own making. Their strength will become their greatest weakness. All of the



predicted scenarios point at the same thing: in order to defeat them, we have to divide and conquer. Operation ‘Sucker Punch’ is designed to do just that. We are going to use tactical surprise to create choke points – in maneuver, in communications, in command and control, in their cyber operations, across the board. We are going to use Big-ALI to determine their intent, their plans, and their weaknesses on the fly. If we can exploit those weaknesses and deceive Orange into thinking they’re winning until they become overextended and overcommitted, we can pick them apart piece by piece. We’ve worked hard to get here. You know this enemy. I don’t have to tell you about their firepower. We’ve watched and trained using *their* tactics for the past 6 years. We have superior active stealth technology- the drone missions we flew over the past 12 days have confirmed that, and we have enough firepower *if we use it right*. We can, and we must win this fight. It is now 1900 hours. Put all stations on alert and be prepared to execute Wave I.”

For the next three hours, data streams from thousands of sources are analyzed continuously by Big-ALI. The extremely fast quantum qubit computers (roughly 10,000 times faster than conventional computers) plow through complex artificial intelligence algorithms and actively model plans, tactics, and strategies, and most importantly, discern the intent of actions. Over 15,000 variations of possible scenarios are analyzed simultaneously. The Purple command group keeps constant watch on the analyses working continuously to determine the “intent” of the Orange forces and their allies. At 2207 hours, an alert is sent to Purple Command Headquarters, code-named “Mt. Vesuvius.” “The probability of Orange attack has suddenly jumped to 85% on 22 scenarios.” Thirteen actions are suggested by Big-ALI to verify enemy intent. At 2208 hours, the Purple Command Task Force initiates six of the actions. Wave I has begun:

- RADAR stations are activated at several locations around the Coulee Valley.
- A fleet of relatively low cost, high speed attack drones are sent over enemy territory – they look like stealth fighters on RADAR and they fly patterns suggesting they are targeting enemy RADAR and jamming sites.
- Field artillery cannons launch more than a dozen rocket propelled rounds that don’t appear aimed at anything in particular – The Orange force detect the rounds but take no action – they do not pose any kind of perceived threat. They believe that the new GPS system used by Purple has been compromised by their cyber experts. Indeed, observers on the ground corroborate reports from the advanced RADAR sensors that the rounds have fallen short, veered off course, or have detonated. In reality, they are way-point beacons designed to provide alternative GPS position and timing signals. At impact, they generate a signature of an explosion.
- A special ground force is ordered into the Coulee Valley – out of reach to the Orange forces for now, but signaling the Purple intent to defend the region.
- A cyber task force is ordered to launch a probe to test the enemy networks.



- An encrypted communication is sent to Purple ambassadors in the region – “Operation ‘Red’ has begun.” Operation Red is a fake set of plans that Purple allowed Orange hackers to intercept previously.

### **2210 hours: Orange Headquarters**

A communications tech-sergeant rushes into Orange Headquarters, “Sir, we’ve intercepted and decrypted a communique from Purple Command Group to Ambassador Valiante, Operation ‘Red’ has begun...we’ve picked up a wave of stealth fighters on RADAR...sir, they’re attacking!” Alarmed, GEN Scarpan shouts, “Send a message to General Arbiss, begin Orange Crush now!” Seconds later a flash message is sent over secure quantum entangled channels to command headquarters – “Purple has launched a preemptive strike; Operation Orange Crush to begin immediately.” Within minutes, Orange reacts with a fury no army in the past has been able to withstand.

- Jammers are activated, fighter jets, drone teams, long-range artillery, and heavy combat divisions are activated.
- Purple RADAR signals are detected and pinpointed. Two stealth bombers are sent to destroy the enemy RADAR sites in one of the regions
- Twelve sorties are launched to destroy the Purple “stealth fighters.”
- Four heavy combat divisions are ordered to cross the river North of the “known” Purple heavy armor position detected some days earlier. Six others are ordered to meet the Purple division head on in the Coulee Valley, so named because it is a broad valley in between two fairly steep mountain ranges. Helicopters in the region are forced to fly within the valley borders. The tactics dictated in the region highly favor the stronger Orange forces. It is a tried and true “killing zone.”

At 2235, using new sensor data, ALI narrows the scenario list to 3 possible actions with 95% probability. ALI recommends dividing the regions occupied by the Orange forces into six sub-regions and assigns distributed sensors and computational units to each of the regions. Two further courses of action are suggested. Purple headquarters launches both actions:

- Stealth drones are sent to intercept the Orange bombers.
- A battery of cruise missiles are sent into the Coulee Valley, presumably to destroy the communications centers and RADAR sets supporting the Orange tank battalions in that area.

Meanwhile at Cyber Command Headquarters, a crack Orange cyber team has been waiting for this opportunity – they begin intercepting the command and control communications to the missiles and begin sending timing disruptions aimed at making the missiles veer off course. At the same time, several high energy laser weapons are trained on predicted trajectories of the missiles to destroy them. The Purple missiles do veer off course –but purposefully. Each one, as it detects that it is receiving incoming laser signals at random sends out a burst signature that looks like a detonation, then they go completely dark. Orange RADAR batteries report complete



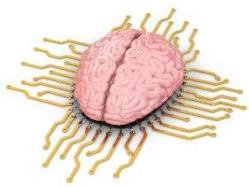
success – all Purple missiles appear destroyed. In reality, only 3 were defeated, the remaining 17 continue on their real mission: to deliver a network of high altitude repeaters – repeaters designed to simply collect and repeat Orange satellite signals but with slight timing delays and higher strength. The effect is spectacular – the timing delays cause the Orange digital communications links to jam and reset. Orange is forced to over utilize the secure quantum entangled links. The com-links are quickly choked and effective command and control in the region is severely hampered.

High in the skies over the North river, Orange fighters detect a set of oncoming jets that look like stealth fighters. “...Icedog, I’ve got contact left, two...no make that four possible bogies bearing 299...copy?” “I’ve got ‘em Birdman, looks like the new 137s...let’s close in and take those [expletives deleted] out!” The Purple attack drones, which appear like stealth fighters, detect the Orange airborne RADAR signals and quickly begin flying typical combat patterns in pairs, two for each of the Orange fighters but with a remarkable twist, one of the drones goes dark using advanced meta-materials: it no longer appears on any Orange sensors. “...OK Icedog, looks like we’ve got two in our sights. I’ll take the left one!” “Roger Birdman, I’m going high!”

The two drones that suddenly went dark fly undetected some distance behind the enemy aircraft –observing quietly and following the motion of both the visible drone and the enemy aircraft move for move. Their mission is to analyze the maneuvers of the Orange pilots! Over a period of a few seconds the invisible drone on Icedog’s tail has collected the data it needs – it has detected a flaw in the pilot’s reaction and suddenly bursts instructions to the “visible” drone. The visible drone makes a particular maneuver and the pilot reacts – crashing his right wing into the drone which detonates... “..what the [expletive deleted]! I’m punching out!!” Twelve seconds later Birdman is not so lucky and is killed instantly by the blast of a missile from one of the three remaining drones that attack as a swarm. His last transmission, “...I can’t shake these [expletives deleted]!!...” The three drones take up positions to support other drone teams with deadly effect.

Meanwhile, other Purple stealth drones that had been ordered aloft more than 12 hours prior and now deep into Orange territory simply watch –and in a burst communication that looks like a sunspot eruption, the exact position of the laser weapons, RADAR sets, command posts, and jammers – anything that emits an electromagnetic signal, are all relayed back to Big-ALI and to command headquarters. Three of the drones receive instruction from Mt. Vesuvius – engage targets 12, 14, and 135. To the complete surprise of the Orange forces, the drones appear briefly on RADAR screens before detonating and eliminating three high value targets; a strategic command link, a long range RADAR site, and a rotary wing command post.

Eerily, the scenario is repeated in various ways across the Orange force with varied amounts of success. Roughly half of the drones in deep territory are eventually shot down. None-the-less, in the course of a single night, Orange leaders have had to engage key assets and have been coerced into actions which appear to have destroyed the Purple forces. In reality, they have compromised key positions, high dollar assets have been lost, and the Purple forces have



sustained only 20 percent of the total perceived damage- damage which leads Orange into Wave II.

## Wave II: The Set-up

### 0720 hours: Orange Headquarters

General Arbiss shouts, “Somebody explain to me this [expletives deleted] situation!!” COL Wrongrite, an intelligence staff officer responds, “General Arbiss, sir, our commanders report that the first Purple strike appears to have been completely defeated. We were able to crash all of their cruise missiles and several fighter jets have been knocked out of the sky, artillery shells have landed short and Purple has foolishly committed heavy armor to the Coulee Valley!” Arbiss explodes, “Then why the [expletives deleted] haven’t our pilots returned and why the [expletives deleted] can’t I get through to the North brigade?!” Wrongrite nervously replies, “Sir, we seem to be having some problems with our tactical networks.” Arbiss rounds on him and shouts, “Then get General Sturgood off his lazy [expletives deleted] and find out where we are on the ground!”

Despite the mounting losses, none of the officers under Arbiss’ command expected this to be an easy victory- it would have to cost *something* against a very powerful enemy. Still, they are confident that the first wave of the Purple attack was repelled successfully. They turn their attention to crushing the Purple armor divisions in the Coulee Valley. In a very simple strategic maneuver, the Orange Divisions will pound away at the Purple forces head-on supported by long range bombers sent from two aircraft super-carriers strategically positioned in the nearby sea.

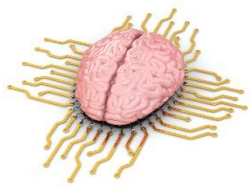
Meanwhile, the fast armor divisions will advance from the North, cut through key supply lines and trap the Purple divisions in the valley. Long range artillery will keep Purple division in the South from joining the fight. Overall, this battle should last no more than a day, two at most.

### 0840 hours: Purple Strategic Headquarters

Big-ALI’s sensor networks have detected new Orange force movements and within seconds, “Mt. Vesuvius” is notified of Orange’s intent (with a calculated accuracy of 98% or better) along with projected strength and probability of success. Big-ALI adjusts its artificial boundaries and suggests several courses of action to counteract the Orange attack. Some of the actions seem bizarre and unwarranted, but the combatant commanders know better...ALI is like a strategic chess player. Moves that appear innocuous can have a crushing effect later on. Purple forces initiate all of the actions:

- Three minor bridges across the North river are destroyed – even though there is no enemy there at the present.
- A set of cluster bombs carrying “smoke” are detonated in the Coulee Valley, even though the smoke is known to be largely useless at concealment to the new infrared sights developed by Orange.
- The advanced armor division in the valley is ordered to engage the enemy head on – over *open communications channels*...almost certainly to their doom.





- Three heavy artillery batteries are ordered to fire on ALI's command into the mouth of the valley just behind the cluster bombs, but in front of the advancing Orange columns.
- Stealth bombers are ordered to attack deep, into multiple regions on strategic points identified in the previous wave by the drones.
- A series of mini-drones equipped with high airburst star-clusters are ordered aloft. The drones carry inexpensive cameras with optical filters that curiously operate in the mid-IR band at wavelengths deemed by most experts as useless due to atmospheric absorption.
- Special rounds delivered by rocket assisted artillery carry miniature electric motor UAVs that have high intensity light emitting diodes that operate in the mid-IR.

### **1120 hours, December 8: Orange Headquarters**

COL Clamup, Wrongrite's replacement, enters the command room, "Sir, GEN Sturgood got through to Group I, the spearhead met with some resistance, but they should be able to take the valley by sundown. His staff says the smoke screen launched by Purple artillery has no effect on our new infrared sites- their tanks are like sitting ducks." Arbiss replies, "And what about the North Brigade?" "Still no word, but the Purple idiots have destroyed three useless bridges across the North River...they don't know what they're doing!" Clamup jokes. Arbiss eyes him coldly, "Idiots huh? Those 'idiots' have managed to sneak into our rear and (rising to a shout) I still don't have any [expletives deleted] communication and why the [expletives deleted] are their radar sites still operating when our stealth bombers report 100% success taking them out?! Tell Sturgood he's got six hours to break through or I'm going to fire his sorry [expletive tirade deleted]!!"

Unknown to the advancing Orange force, the "smoke" was an infrared paint that glows like a beacon in the mid-infrared range. Because the wavelengths were generally deemed by most experts as useless, Orange never developed the capability to detect light at those wavelengths. They cannot tell that they are easily visible from space as well as by the Purple drones that have been launched. The artillery barrage controlled by Big-ALI was carefully timed by the computer system to create a bow wave – a 40 mile per hour wind that drove the paint through the valley and covered over 85% of Orange equipment and personnel. The paint rendered the stealth camouflage on the tanks and equipment completely useless.

For the next few hours the Orange spearhead pounds through the valley, all the while, the drones flash back to Big-ALI, movement, number and types of units, positions, location of troops, etc. They are small, lightweight, and most importantly inexpensive. In all, over 2000 were launched. Of course, Orange saw them and tried to counter them but there were simply too many to deal with. Hundreds of targets would appear and disappear on RADAR screens and automated targeting systems could only effectively handle a few at a time. In terms of firepower, they were nothing more than a nuisance but the real devastation was the information they were sending – information that allowed Big-ALI to quickly analyze and plot probable courses of action.



Slowly, methodically, key Orange assets are destroyed using combinations of more conventional air support, long range missiles and rocket assisted artillery. Narrow corridors are opened where Purple has access – deep access into enemy lines. Hundreds of individual disruptions, minor skirmishes, and attacks occur. Each one with no seeming devastating impact individually, but taken as a whole begin to cripple Orange communications lines and lanes of movement. Throughout the rest of the day, the lanes begin to expand until suddenly Big-ALI's tactics become clear – the Orange force is roughly divided into the six regions originally analyzed by the machine.

### **1230 hours: Purple Strategic Command Headquarters**

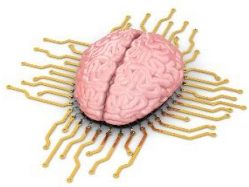
COL Sanders rushes into command headquarters, "Sir, you need to take a look at this! ALI is calling for...for head on engagement in the Coulee Valley!?" "What?! Are you sure?" GEN Allbright asks. "Check the back-up network and see if ALI has been compromised." COL Sanders responds, "General Arbitter says she has checked and rechecked - ALI recommends all six divisions engage with full air support, here, here, and here [pointing to a virtual map on the wall]." Allbright thinks for a moment, "Run a query and see what ALI is trying to do." To the surprise of all, Big-ALI has discerned the overconfidence of the Orange commanders and has detected a vital flaw in Orange plans. If Orange continues its current course of action, within 6.5 hours they will overextend the range of slower artillery which can be cut off in a counter attack. The attack has an 80% chance of success to drive them to the edge of the river where the three bridges have been destroyed cutting off any hope for escape. Without the artillery, the Orange force coming in from the North can be cut off from their counterparts in the valley! Purple forces in the South would then have a 73% chance of fully stopping the Orange North Army! The head on attack is a ruse designed to lure Orange into a trap!

Cautiously following ALI's suggestion, Purple proceeds and the battle for the region rages on into the evening. The Orange forces proceed forward, enjoying relatively easy success. They have losses, yes, but their killing machine appears to be doing its job and doing it well. They estimate that they will break through and destroy the Purple defense by early morning.

Big-ALI has been busy, too. It has one more "trick up its sleeve." Just before dusk, it alerts Mt. Vesuvius, "Recommended Action: begin Wave III - Operation 'Sucker Punch.'"

### **Wave III: Operation "Sucker Punch"**

The Orange force has engaged Purple tanks in the valley and apparently destroyed them. Leaving the tanks for "dead," they pushed on through to the open plains and start heading for the Purple South Army. Within two or three hours, the North force should be joining them. For some reason, they have received little communications from them. Perhaps they got bogged down by a larger force but the artillery will soon take care of that. What they did not know was that the forward Purple "tank" division was a series of real tanks interspersed with multiple robotic "wingmen." The wingmen were unusual in that they had the ability to cloak themselves,



to present false target information. They could produce target signatures that deceived the enemy into thinking that they were destroyed. In reality, the Purple heavy armor was still at 86% strength. They were now behind the Orange tank columns and could attack from behind – which they did.

The remaining tanks on the North side began driving towards the heavy artillery – toward the river.

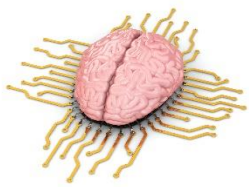
The battle raged on for the next 6 hours. The Orange artillery largely ran out of ammunition and was forced to flee – to their doom. The Orange main column tried to reposition and maneuver to help, but it was too late. Their planned “pincer” movement was choked in the valley due to their sheer size. The North Brigade was never heard from again. Cut off from overhead air support in another tactic devised by Big-ALI, the force was crushed by Purple stealth bombers aided by cannon delivered drones from Naval Warships. Cruise missiles were guided by unmanned ground “sentinels” air-dropped into the region.

The technological advances have had their “vote” in the outcome in very stark terms. Purple aircraft and ground teams, though outnumbered, traveled faster, maneuvered better, and remained coordinated throughout the fight. The cannon-delivered waypoints easily overcame the Orange attempts to disrupt precision navigation and timing. The stealth technology was used to great advantage to manipulate and deceive. Once the Purple Air Command got full air superiority, the Orange ground forces were cut-off and reduced to shambles. From space, the once powerful Orange Army looked like a giant cracked eggshell, divided and disheveled, unable to get out of their own way.

As nightfall approached, the large Orange spearhead began lighting up like a siren calling her sailors to their death. High above, bombers picked their targets with deadly accuracy. Big-ALI constantly making suggestions, constantly discerning the Orange reactions, consistently anticipating what Orange would do... Orange had been sucker punched by Big-ALI!

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Dr. Reiner is the owner and CEO for Physics Renaissance, LLC. He provides senior level scientific consulting and expertise to a wide variety of aerospace and military customers. Currently, he serves as the Basic Research and Development Portfolio Lead for the Chief Technology Office of the US Army Materiel Command (Headquarters), Redstone Arsenal. Dr. Reiner has over 30 years’ experience managing and developing scientific programs in a wide variety of areas. Dr. Reiner earned his PhD in Physics from the University of Rochester, in Rochester, NY in High Energy Physics in 1985. He has demonstrated expertise in electro-optics, photo-lithographic sciences, radiation physics, microwave physics, optics, and nano- and micro-electro-mechanical systems (NEMS and MEMS) development. He also served in the US Army Ordnance Corp and earned the Meritorious Service Medal and was honorably discharged at the rank of Captain in 1989.



The Army's Guardian Angels  
By Matthew Diehl

*Prologue: In the near future robotics and networked sensors will be found in the air, on the ground, in and under the sea. Human soldiers will still be needed to access areas denied to robots and to make direct contact with other humans, both friend and enemy. The mass of information to be analyzed from countless sensors and the 24 hour nature of combat will demand more of our soldiers than ever before. It is incumbent on us as scientists and engineers to integrate new technology with our warfighters in a way that enhances their combat effectiveness.*

*Lieutenant Collins and his platoon are about to be assigned a mission to rescue an American NGO aid worker and a diplomat, the last survivors of a convoy ambushed in a lawless section of San Terrania when the previous government fell apart. Their story is a hint of things to come...*

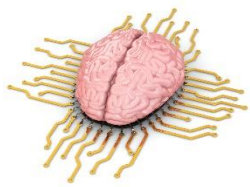
Lieutenant Collins stood outside the Major Thomas' office straining to hear the vocal discussion going on inside through the closed door. Captain Redd stood up for his teams when it looked like their mission was a little less than half baked, and in the last week that was pretty much all the missions.

Almost a week ago the government of San Terrania had evaporated. On day one, a coup in the capital and the federal military HQ killed or scattered all the government's leaders, and the regular police forces were wisely staying out of sight. The next day the coup leaders turned on each other and that left no one in charge. In the absence of any authorities every militant and criminal had come out of the wood work with guns and looted the national armory. Just the sort of happy go lucky place you would want to live and work.

So far the American base had been left alone. It was located almost 50 miles up the coast from the Capital and not near any real population center. It wasn't on the menu just yet. The militias and gangs were staking out their territories and eventually some of the looted ordnance would be pointed our way. For now, Lieutenant Collins and his team had been making short runs to bring in the American and allied personnel, both military and civilian, who got caught out in the storm and were forced to shelter in place waiting for help. Clearly there was another mission to assign.

The debate in the Major's office quieted down and Captain Redd opened the door. "Lieutenant come in please."

The Major, Captain Redd, and an agitated, red-faced civilian in a rumpled suit had been in the meeting. Major Thomas spoke first, "Lieutenant we have a new mission for you. Mr. Steinfeld is from the U.S Diplomatic Mission. You are probably aware that there was an aid convoy



ambushed two days ago in Sorrent Province. At the time we believed all the members of the convoy had been killed, but Mr. Steinfeld has information that suggests one aid worker and a diplomat survived the attack and are being held prisoner by a local militia. We don't know their current condition or exact location, but we have a suspected site to investigate. If it pans out we want them retrieved as soon as possible."

"Do you have anything to add Mr. Steinfeld?" asked the Major.

Mr. Steinfeld was clearly distraught from the loss of so many people and very emotional in his plea, "Lieutenant Collins, David Lewanski is my best and most experienced negotiator. He went into the field with the aid workers to ensure they came home safely. Please bring these folks home for me. I don't know when we will stabilize this political situation, but when we finally do we are going to need people like David to put this country back together."

The mission briefing with Captain Redd was quick and efficient. Drop into hazardous territory, find two lost sheep without being discovered and get the heck out. The mission was already underway, just not with boots on the ground yet.

At the same time, 90 miles north, an eagle shaped UAV was gliding on the thermals rising off the sun warmed slopes of the mountains. The upper surface of the wings included conformal solar cells to charge the batteries, and the updraft allowed the UAV to return to high altitude for a good field of view. The occasional real eagle or vulture that took an interest would glide in formation studying the odd looking bird before moving off. There wasn't much moving on the ground, but the UAV was also collecting Signals Intelligence (SIGINT), mostly phone calls and radio transmissions. There was the usual chatter in the open, but once in a while there were encrypted transmissions in the sat-phone band. The artificial intelligence software flagged that for further analysis and built a file on the location and content of the signal. Given good thermals and a daily dose of sunlight the UAV could fly for months listening and watching from on high. A flock of eagle UAVs could even network signals, share data on thermal updrafts and autonomously coordinate their surveillance for better coverage.

Later that night Lieutenant Collins and his platoon suited up to start their mission. There was a little grumbling, but they knew lives were hanging in the balance and they wanted to ensure they were on the ground and in position well before the sun was up. Each member of the team wore a wing suit and oxygen supply, along with a combat sensor/comms helmet, suppressed personal weapon and a supply of food and water. It was time to get in the game.

The transport aircraft took them up to 30,000 feet and equalized pressure with the outside before the rear door opened. It only took a few seconds for the team to run out the back and leap into the darkness before the plane turned for home. Before the cargo door closed, the crew also threw three more eagle UAVs out the back to assist with the mission. The UAVs would automatically deploy and loiter until they received commands to proceed to a patrol area.



The wing suits were amazing. They were thermally insulating, radar absorbing, and had a built in oxygen supply. There was almost no way to track the team as they glided to earth over 20 miles from where they left the transport. Courtesy of the infrared and night vision sensors in their helmets, the team could see each other in their augmented visual helmet displays and they flew in a loose formation. As they approached the ground they flared their wings and deployed a small square chute for the final leg of the drop into the landing zone. A minute later the entire team had concealed their chutes and wing suits and started hiking toward the objective.

“Lieutenant Collins, this is Mission Control your eye in the sky, Angel 52 requesting comms check.”

“Angel 52, this is Lieutenant Collins. SITREP: quiet and dark here in San Terrania. How’s the neighborhood?”

“The neighborhood is quiet for now. I have the data stream on all nine of you. No unusual vitals. Confirm no injuries?”

“No injuries Angel 52. Where are we headed?”

“Lieutenant, the highlighted area on your map indicates an old mining facility and camp. There hasn’t been active mining for decades, but SIGINT shows encrypted comms traffic and there is a partially camouflaged solar array around the end of the hill from your position. I recommend you put your squads here and here on the map for surveillance. I’ll deliver a snake to take a closer look at the site.”

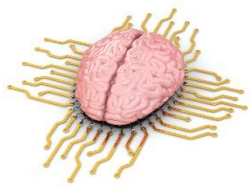
“Understood Angel 52. Route the snake’s signal to me when it has something.”

High above, a brown snake slithered free of its UAV host. It didn’t weigh much, so it needed only a small parachute for a gliding descent and its tail could provide steering on the way down. The snake hit the ground with a puff of dust and a bounce. Once it had a fix on the mining facility it slithered its way toward the closest building.

Made of electro-plastic muscles, this wasn’t an ordinary snake. Its head included infrared and visual cameras, as well as acoustic and vibration sensors to collect data. Communication took place through either RF or a narrow nonvisible light frequency that was all but undetectable without special equipment. The snake’s onboard CPU was able to recognize approaching humans or animals and decide whether to hide or go dormant until the threat was past. The intelligence it gathered was invaluable for allowing the team to map a facility and identify targets while remaining safely hidden outside the camp.

Lieutenant Collins followed the progress of the snake on his visor as it entered the steel shack. He could hear conversation, but didn’t understand the words spoken between the men inside. He certainly did recognize the distinctive muzzles of the 12.7mm DShK machine gun and a couple RPG launchers hanging over the edge the table above the snake, as well as the 7.62 AK





weapon cradled in the arms of the guard peering out the window. It was too much hardware for the few guys he'd seen so far. There must be more hiding in the camp. The communications center was not visible in this building either.

"Angel 52 to Lieutenant Collins."

"Collins here."

"Sorry we don't have real-time auto-translation on this dialect, but the conversation was about prisoners and waiting on orders from a superior. I'll leave snake 1 where it is and drop a few more. Stand by. Angel 52 out."

Five minutes later more little brown snakes made dust puffs around the mining camp and went to work.

Lieutenant Collins relayed the video of the conversation in the shack to his team to keep them up to speed on the target. Shortly before dawn the team reached the crest of the hill overlooking the mining camp and they settled into concealed hiding spots off the trail with a good view of the valley. Now it was time to wait and watch.

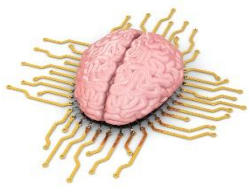
Later that morning three men stepped out of the shack with a quad-copter. Everyone in the team knew this could be trouble. The small UAV took off and started orbiting the camp as the enemy pilot got comfortable with the device. It flew up to about 1000 feet and started following the dirt road while the three men stepped back under the overhanging roof of the shack so they were invisible to overhead surveillance. For now Lieutenant Collins and his team were safe up on the hill side under their chromatic covers, but there was a reasonably good chance they would be discovered with IR sensors if the quad-copter went on a night flight over the cooling landscape.

Shooting down the quad-copter would reveal their presence so that wasn't a good option. "Angel 52 do you have any assets to take down the enemy UAV?" Lieutenant Collins asked hopefully.

"Stand by Lieutenant. I've got a spare eagle available as soon as the copter gets out of sight of the pilot."

After about 10 minutes a UAV disguised as an eagle swooped down and smashed into the quad-copter. To anyone on the ground and even to the copter's camera it would look like a real eagle had attacked the copter. Both the enemy UAV and the eagle fell tumbling into the rocks below.

"Lieutenant, the enemy copter has been disabled and the good news is that it crashed high up on a steep slope, remote enough that it would take those guys a few hours of climbing to retrieve it. The bad news is that my eagle is also down. Hopefully those guys don't have more quad-copters ready to fly."



“Thanks Angel 52. We will recover the eagle if we have the opportunity. Any signals from our snakes?”

“Funny you should ask Lieutenant. Snake 3 is now in their comms center and Snake 4 is making its way down a side tunnel that had an armed guard at the entrance. We should have a good picture soon.”

“Angel 52, it will be a while before dark and we are ready to catch some shut eye down here. Are you on guard duty this afternoon,” asked Lieutenant Collins?

“Affirmative Lieutenant. Stay out of sight and rest. I have three assets on station now and Angel 17 will join me shortly. By the way, the brass is watching the feed now. We believe your location is the hideout of the coup leader who started this whole mess and who is still pulling the strings in the capital. If so, we might have more than a rescue mission to execute. Angel has the watch.”

The team was well camouflaged and out of sight for the rest of the afternoon. It was dusk when Lieutenant Collins woke to a whisper in his earpiece. “Lieutenant, Angel 17 here.” Collins was instantly awake, but didn’t move. He studied the graphics Angel 17 had downloaded to him and blinked three times to silently let her know he was awake.

“Lieutenant, there is a party approaching your position on the trail from upslope. Your team is awake and listening. There are four males with rifles, and what appear to be one male and one female prisoner. I can see handcuffs on the prisoners. They will be visible to your position in about three minutes. The armed males appear to have night vision. At least they aren’t stumbling where the prisoners are. Snake 1 reports that the guard at the camp is on duty. How do you wish to proceed?”

“Squad 1, I need four shooters. Squad 2 and machine gunner stay quiet for now, but be ready. You have less than one minute to move into position. You are parallel to the trail so each of you take one target. Share your fire control lock when your target is in your sights. When all four icons turn green I’ll order you to fire. Only fire a second shot if needed. Hopefully the prisoners are the folks we’re here to rescue.”

The squad wriggled into firing positions over the trail being careful to expose only the top of their helmets where the IR and targeting sensors could see and range the targets. Once the targets were even with the squad their eyes would be on the trail and not looking to the side where the shots would come from. Patiently waiting, the icons turned green and four shots were fired. All targets went down. The prisoners dropped to the ground and hid behind low rocks, eyes wide expecting the worst. Sergeant Umway was closest to the prisoners and spoke softly to them.

“Who are you,” he asked in English?



They both rolled up as best they could with handcuffs on. “Oh, Thank God!” They whispered back. “I’m Dave Lewanski from the embassy and this is Kelly Baker from Care For Kids. How did you find us?”

“Just hanging out here sir. Who’s got the key to the cuffs?”

“The last guy, left pants pocket,” reported David.

The cuffs were removed but the abrasions on David and Kelly’s wrists were raw and bleeding. Sergeant Umway applied some Sim-Skin from his med kit. It would stop the bleeding, prevent infection and the anesthetic would dull the pain.

“Sergeant, are you here all alone,” Kelly asked?

“No Ma’am, the rest of the platoon is here along with Angel,” replied Sergeant Umway.

“I don’t see anyone else, and who is Angel,” Kelly asked?

“No one sees us Ma’am. Except Angel. Angel is all around us, in the sky, on the ground, even underwater or underground sometimes. Angel sees what we see and hears what we hear. Like a Guardian Angel, which is where the name come from.”

Lieutenant Collins appeared quietly out of the dark. “David, Kelly, I’m pleased we found you. I’m Lieutenant Collins,” he said as he shook hands with both of them. “Angel wants to know if there were other survivors from your convoy?”

“Yes,” David replied. “There were ten others who survived the attack. We were separated two days ago and don’t know where they were taken. Did you already find them? Are they OK?”

“Sir, we believe there are prisoners in the mining camp down in the valley. There are about 20 armed enemy personnel we know about hiding out of sight in the camp plus some sophisticated comms gear. Those prisoners could be your people. Angel and the brass are talking about the plan now.”

“Well we have to rescue them Lieutenant!” David said. “That should be obvious! You tell this Angel...”

“Not my call sir. But, they haven’t sent instructions on our ride out of here yet, so we are probably going to get company.”

“How can we get company,” David asked? “We are on a mountain. I know you can’t parachute people into a boulder field like this. All you would get is broken ankles, legs and necks!”

The answer came an hour later...

“Lieutenant. This is Angel 52 and 17.”

“What’s the plan Angel?”



“The snakes have mapped out the building and the tunnel area where the prisoners are being held. We can’t hit the enemy quarters with anything big or we run the risk of collapsing the tunnel or killing the prisoners with overpressure. So, we are going to air drop a set of twins by glider.” Twins were ground combat robots designed to fight as a pair. “You have IFF built into your comms so they won’t shoot you or your team, but keep the civilians close and don’t get ahead of the twins while they do their job. Understood?”

“Yes Ma’am. I saw a set of twins rip through a bunker back home and I’m perfectly happy to stay out of their way.”

“What’s the time table,” asked Lieutenant Collins?

“Move your team down toward the camp and take up position on the bank of the stream near the road where you will be out of sight and protected. The twins will arrive by glider in about 20 minutes. They only need a minute to deploy and then I’ll take out the guard shack and knock in the door on the main building. By the time you get across the road the twins will have neutralized any remaining enemy personnel in the building and will move into the mine taking out any other personnel they find. After that I’ll have them take up position in the side tunnel to prevent anyone from reaching the prisoners. You follow the twins down the tunnel and secure the prisoners. Any questions?”

“Once we raise hell and have the prisoners, what is our exit plan,” asked Lieutenant Collins?

“The large building at the edge of the camp has a truck inside. Take the truck and get out to the coordinates shown on your map. There is a landing spot large enough for the helo to pick you up. Bring the twins back out with you unless they are too damaged to bother. If they are, we will remote detonate their onboard charges and scatter their parts.”

Collins and his team moved into position quickly but carefully using LIDAR sensors in their helmets to search for trip wires, IEDs, mines and sensors as they moved down the hill. Once they were concealed and protected by the embankment along the stream they waited for the twins to arrive. Right on time there was a skidding crunching sound from just out of sight up the valley and moments later two multi-wheeled robots came zipping up the road. Both had a low center of gravity, armored glacis in the front, and two arms that deployed up from the body. Each robot had one arm equipped with a machine pistol, with the other arm free to manipulate doors, climb obstacles, plant explosive charges or throw grenades. The Lieutenant could see a ring of sensor eyes on the body of the robot and some on the hands. It could see across the full range of IR, visual, radar and terahertz frequencies. It could lose 20 or more of its eyes and it could still see, navigate and shoot just fine. The power supply was good for about 30 minutes of intense activity or 30 days on surveillance standby. Tonight would not require 30 minutes.



When the team and the twins were ready the show began. Two invisible 50 pound glide bombs were launched from a weapons drone loitering over 30 miles away and at 42,000 ft altitude. It took about 8 minutes for the bombs to arrive following their preprogrammed glide path. When they were in sight of their targets, the bombs switched over to the target image Angel had provided for precise hit points. When they hit it was impressive. One bomb hit the corrugated steel shack, both shack and the guard disappeared in a thermite augmented blast. Secondary explosions indicated the RPG rounds were consumed as well. Seconds later the other bomb flew through the side of the main building, and continued halfway to the mine entrance where it detonated. Everyone inside was killed and the side of the building was opened for easy entry. The twins didn't wait for an invitation. They sped off into the dark. It seemed like only seconds and they had climbed over or under the debris of the building and entered the mine. As they sped down the tunnel, they encountered enemy personnel stumbling around in the dark, still disoriented by the blast. The robots targeted each human enemy with two shots, one at the center of mass and one at the head in case the target was wearing body armor. Before the targets fell to the ground, the robots were already speeding past, picking their next targets. There was a fair amount of shooting over the next 60 seconds and then it got quiet.

"Lieutenant, your team can enter the mine tunnel. I can see a lock on the door where the prisoners are located. See if you can grab a pry bar on the way through, or you will need a cutting charge," instructed Angel 52.

It only took a few minutes to retrieve the prisoners. Ten in all, but two were wounded and not in shape to walk out. The squad fashioned makeshift stretchers for the wounded, and by the time they exited the mine, the second squad had the truck running. They loaded the wounded while four men lifted the twins into the back and then everyone else boarded the truck. Now they just needed a nice quiet ride to the pickup point.

A little way down the road Angel called. "Lieutenant, hold up. You've got company coming your way from the town up the road. One army truck with a heavy machine gun in the lead and two more trucks full of armed men. Looks like they heard the glide bombs and plan to investigate. You don't have any place to hide or side roads to take that will let you avoid them. I'm checking on assets now, but we may need to use the twins to slow them down."

"Understood Angel. The twins are in good shape. We will reload their ammo."

A minute later Angel called again. "Lieutenant, get the twins on the ground ASAP and back the truck up as far as you can around the corner. You need to be out of sight and out of danger from bullets and shrapnel."

The twins were quickly placed on the ground and they disappeared into the darkness while the truck retreated up the road and around the corner out of harm's way. At Angel's direction one of the twins climbed the side of the hill and took up a firing position behind a rock for protection. The other hid in the scrub grass along the edge of the road. Shortly afterward the



lead army truck came speeding up the road with the other two trucks close behind. Angle designated the trucks as enemy vehicles and then the twin hiding along the road opened fire on the lead truck. The small caliber bullets couldn't penetrate the windshield and the machine gunner in the back was protected behind the bulk of the cab, but the surprised driver did skid to a stop while the gunner opened up wildly with the machine gun unable to find a clear target. It never occurred to him that the target was a two foot high robot in the weeds right in front of him, and the machine gun couldn't depress far enough to hit the robot anyway.

The other twin up on the hill sprayed bullets at the men in the next two trucks, who quickly dove for cover. They could tell the shots were coming from the rise on their left so they rolled out over the right side of the truck and stayed down. After a few minutes the robots ran out of ammo. Both twins then made kamikaze runs on the trucks, but their internal self-destruct charges weren't enough to do serious damage to the heavy blast resistant vehicles.

"Angel, thank you and the twins for the fire support. We are ready to deploy into defensive positions," said Lieutenant Collins.

"Stay right where you are Lieutenant! Angel 17 arranged for some friends to lend a hand. Please tell the civilians with you to cover their ears. 10, 9, 8.....2, 1."

BOOM, BOOM, BOOM! The three nearly simultaneous blasts were tremendous. The ground shook and small avalanches of loose rocks rained down the slopes on either side of the small valley.

"What the heck was that Angel," shouted Lieutenant Collins?

"Our friends in the Navy happened to have a Zumwalt destroyer off the coast. Their 155 mm long range guided rounds fly over one hundred miles and can hit a target with GPS precision," replied Angel 17. "Now you just need to pick your way through the wreckage and head for the landing site. Your aircraft is inbound."

As they left, the Lieutenant could see flames devouring the glider that the twins arrived on less than an hour before. All that would be left in the morning would be a few blackened and twisted metal parts and composite materials reduced to ashes.

The big helo arrived on schedule just before dawn. It had twin counter-rotating rotors and about half way down each side there were remotely operated turrets with 20mm Gatling guns that could fire forward during an attack run or swing around to fire in a wide arc toward the tail. With auto-targeting it only took one crew member to operate the weapons and Angel could assist remotely if necessary. It looked scary from any angle. The wounded were loaded and the medic applied health sensor patches to assess their condition and started treating them immediately. Everyone climbed aboard for the trip back to the U.S. base.





When they arrived at base, medical personnel already had the health sensor data and whisked away the civilians to treat their wounds. Lieutenant Collins and his team headed for debriefing and a good meal.

As Lieutenant Collins walked back to report to the Captain he found Mr. Steinfeld waiting for him. "Lieutenant, I can't thank you enough for what you did in the last couple of days. It is awfully good to know that people like you are on our side when we get into trouble."

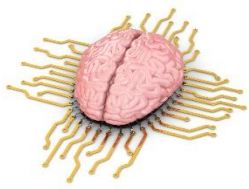
"Thank you sir. We are here when you need us."

As they parted the Lieutenant whispered "And thank you too Angel." To his surprise Angel answered "It's our privilege Collins. Now get some sleep. You yawned 17 times in the last three minutes."

*Epilogue: Technology has the potential to overwhelm our soldiers with information to the point that they can't function as soldiers when they need to. Operating secretly with minimal equipment so they can move fast makes the challenge even more difficult. The Guardian Angels and semi-autonomous assets in this story are one way to off-load the bulk of the sensor processing and equipment from the soldiers on the ground so they can focus on what is in front of them. It also allows them to react more quickly to real world changes in the situation. The robots are relatively simple technology that allow the soldier to take a step back from the danger zone. The robots are also an element of surprise and swift action that a human can't achieve. Combat robots may be the stuff of fiction today, but we've already imagined them and the technology exists to build them. The only question is whether our soldiers will send combat robots into battle or be forced to face them.*



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## The More Things Change By Jenny Oberholtzer

Ksenia Davidovna Kalomenskaya cracked her knuckles. It was 11pm Eastern Time, which meant time to deploy her favorite exploit.

Unlike some of her fellows within the New Troll Plant in Petrograd, Ksenia enjoyed this particular weapon out of more than grim humor. Since hostilities had begun three months before, she'd had few opportunities to tuck Simon in at night; her mother had spirited the boy away to a dacha in the Urals for safe-keeping. This was one way she got to feel close to him.

She clicked her mouse once, and leaned back to enjoy her handiwork.

Across the world, dozens of baby monitors crackled to life.

"Tili-tili-bom, zakroj glaza skoree, kto-to khodit z'oknom, i stuchitsta v dveri."

Ksenia sang her son's favorite song to infants in American military families, quietly coaxing some of them awake. A few children stirred.

Juniper Alvarez-Doyle, a thirteen-month-old sprawled in a crib in Springfield, VA, began to whimper.

Had her mother been there, instead of deployed to the Lithuanian front, she might have ignored the noise, hoping to train June to sleep through the night. With her gone, Patrick Doyle was struggling to sleep, and heard the singing. Bleary-eyed, he shuffled into his daughter's room to turn off what he assumed was an irritating toy given to him by an overindulgent grandparent. Instead, he arrived in time to hear Ksenia's follow-on speech.

"This is a message from the mothers of Russia to American military families. We are begging you to think of our children, and of your own. More fighting will bring more orphans, and no child should live without a parent."

Horried, Patrick hit the off switch, and immediately called his boss, then emailed his wife.

In Petrograd, Ksenia enjoyed the God's-eye-view her position in information operations gave her. Noting that one of the monitors had tripped, she focused on the IP address, and pulled up all related devices. Spiraling from devices, Ksenia traced other access at that location, including unencrypted transmissions and geo-tagged photos.

A couple, smiling in uniform. A chubby baby girl in a bubble bath. Two months ago, deployment orders and unit assignments. In Isabel Alvarez, Ksenia found a kindred spirit- a devoted patriot to her nation in information operations and a student of Russian poetry. Let the games begin.



Patrick dropped Juniper off at the Child Development Center, still a little shaky from the night before. He headed into the former Pred Pit, a small office building full of screens, computers and joysticks. He poured a cup of coffee, tossed a ball to Porkchop (who'd been working double time as the unit's companion dog for the past ten weeks) and set himself behind his pilot and gunner.

"Doctor, Doctor," Pat greeted his team. "We see anything exciting and new yet today?"

"More dirt. More trees. Super exciting." CPT Kao was in a mood. He hadn't seen anything worth painting red in a good week, and tended to get grumpy when his destructive impulses weren't channeled.

"Cool, cool." Pat narrowed his eyes, and pointed. "What's that?"

Kao shrugged. "Sparrow Flock. You never see one fly this high up before?"

He hadn't. "They look like ants all the way down there."

Kao cracked a grin, finally. "Dude, they're tiny, but I'd hate to have one poke me in an engine."

---

East of Mariupol, Isabel "Duffle" Alvarez was making her last checks on her Sparrow Flock. The handsized drones seemed to preen and coo as she uploaded the next batch of orders. Their synthetic feathers and lightweight skeletons concealed a surprising sturdiness. She liked working with Sparrows; they reminded her of the pigeons she grew up with in Los Angeles. Much like the pigeons, Sparrows were capable of carrying vital messages.

With the task complete, Duffle handed the Sparrows over to her flight crew for launch. The flock took off without a hitch, and spread out wide. Duffle, the flight chief (Pups) and the maintenance chief (Crisco) took their seats in the mobile TOU, and began their real work.

Today's goal was infiltration and exploitation. With two dozen Sparrows in the air, the probability of at least one getting through to a Greater Russian unit was pretty good. While the Russians had taken a page out of the Dutch play book a few years ago, they didn't have enough trained birds of prey to kill every small drone. Moreover, trying to hit a Sparrow with a traditional surface-to-air missile was akin to trying to kill a cockroach with a falling refrigerator. Plenty of noise would crash and lights would flash, and the Sparrow would bounce right off.

While most of the data would transmit back to Duffle's team via satellite, select information beamed simultaneously to NATO basing in Poland. There, the American Sparrow flocks sensor data would meld with overhead imagery, FISINT, and pre-existing GEOINT to provide NATO forces with probable locations of Russian forces.



Janek Harma, a scruffy Estonian statistician, was one of the leading minds behind Project Streetlamp, the artificial intelligence responsible for the estimates.

Unfortunately for his colleagues, Janek was busy thumping the monitor and swearing loudly. “Perkele! Piece of bloody pointless brainless piece of...”

His Polish counterpart snatched her coffee mug off the long table before it could fall.

“Janek, the mainframe is sitting next door, yes? He cannot hear you here. Go next door to shout.”

“He’s confused. Something is wrong. Either all of the Russians have not moved in the past six hours, or Streetlamp is broken.”

Aga knew the Russians as well as anyone in Krakow. Unless a siege was underway, there was only one possibility. She adjusted her glasses. “The sats are fine. Uplinks?”

Janek nodded to the trio of enlisted Germans busy at the neighboring screen. The senior NCO, Lukas threw a thumbs up. “All is good. Flocks Bravo, Charlie and Kilo all broadcasting clear outside Kaunas.”

Janek puzzled over this. If they were fine, and the sats were fine, the problem must be coming from elsewhere. Aga disagreed. “Call the operators. They will know.”

Back in Kaunas, Duffle’s comms beeped until she picked up. “Kilo Flock Nest.”

A thick German accent greeted her. “Kilo Flock Nest, this is Krakow Base. Confirm status of Kilo Flock.”

Crisco confirmed the maintenance status. Twenty-four of twenty-four Sparrows were still flying strong, ten hours in.

Duffle started to relay this to Lukas in Krakow, but stopped short. “Chief, does that seem right to you?”

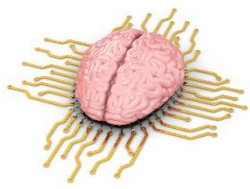
Crisco shrugged. “It’s lucky.”

Pups leaned back. “It’s weird,” she said. “Weather like this? Normally we’d be down at least three by now.”

Duffle brought up visual feeds, cycling from bird to bird. They all seemed to be flying free, but something wasn’t right.

“Krakow Base, we’ve got a problem. Kilo Flock is reporting perfect system status, ten hours in. I repeat, perfect system status.”

In Krakow, it was Aga’s turn to swear. “Janek, disregard all reporting from Kilo Flock.”



With a copy of clicks, Streetlamp filtered all sensor data from the anomalous flock. The area of probable location expanded. The Russian troops had definitely moved; the real question was where.

Pups and Duffle were nervous. "Time to return to base, you think?" the flight chief asked her intel officer. Duffle nodded.

Twenty-one of the Sparrows landed within a half hour. Two more circled lazily overhead a few minutes later. The telltale high-pitched buzz drew the crew's attention.

"Chief, does that seem normal to you?"

Crisco shook his head. "Think we should run?"

The Sparrows made the choice for them. They dove, metal claws out, synthetic feathers flattening as they hurtled for the three fleeing Americans. Two meters above the ground, they detonated.

---

The final Sparrow took aim for a Predator hovering far above the tent.

"Pat, we have an engine flameout." Kao, like most pilots, knew how to run through the checklist for a crashing Pred. Unlike most pilots, Kao was a four-time crasher, almost a reverse ace, who seemed to take a perverse joy in watching the final flight. "Mind if I grab some popcorn? This could take a while."

"Take 5. It's close enough to our side. No need to worry about recovery yet." While Kao hit up the microwave, Pat called it in, warning the local recovery team about the impending crash.

Coming back into the SCIF, Kao knocked the back of Pat's chair. "Man, you wanna say some words for our doomed buddy?"

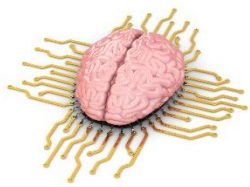
"Nah. You do it."

"Pat, that rustbucket can glide for-freakin'-ever. I can write a bunch of limericks between now and crash landing it. I figure you should do the honors. This is your first Valkyrie flight? You gotta do it or you get no respect from me ever again."

"Fine. There once was a filthy rustbucket/whose pilot we all told to suck it. No cause for alarm/no real proof of harm/ crashed five times? Why not? Just say '@#\$% it.'"

"Ouch. You wound me."

"Not as bad as you wounded my drone, dumb@#\$."



Flight instruments indicated a slow descent. Kao gently guided the drone west. A hush fell over the room as other teams noticed the doomed flight. The last five minutes of the Predator's service life passed in near total silence.

At 15 m above sea level, the onboard camera cut out, and Pat fist-bumped Kao. "Bro, we're gonna pour out a 40 for him tonight, right?"

"Only if you're down to sing 'Arms of the Angels.'"

"Damn skippy I am."

With the formalities handled, Pat checked back through the data feeds. "Can we pull up left wing footage from the flame out?"

Together, they watched a speck hurtle upwards and into the intake. It wasn't a bird, or a missile, though it shared attributes of both.

"How the hell'd a Sparrow pull a stunt like that?" asked Kao. He pulled up a chat window, and sent the question to other pilots online.

"Screw how. We saw it happen. Why'd it happen?"

---

In Petrograd, Ksenia's day was beginning again. It being a Thursday, the Trolls gathered outside the big office for their weekly update to the Colonel. Each team provided separate updates to keep information segregated.

After Ksenia provided the list of targeted American troops and a brief overview of the information operations in which her small team had engaged, she padded back down the stairs to her desk.

The Colonel stayed put, and heard more. An attack in Germany, targeting rail networks. Boring but useful hacks of American and FVEY networks both classified and not. Manipulation of shipping details, to guarantee that the wrong resources would reach precisely the wrong troops. A charming tweak of American micro-drones that caused their batteries to overheat to the point of explosion when ordered to return to base.

Sometimes the kids responsible for the fancier hacks made the Colonel nervous, but the latest group just made him smile. Their unbridled enthusiasm for 'pranks' reminded him of himself as a cadet. Besides, this particular attack wasn't as nasty as a typical artillery attack. It almost felt merciful.

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Duffle came to behind a pile of sandbags. Her ears were still ringing, and she definitely could taste gravel and copper, but she could still make out Pups' voice. The chief was crouching over Crisco, holding C-Spine while a corpsman checked the rest of his vitals, eventually giving up.

The little drone had some serious bang to it. The small explosion managed to fry a couple of the more vulnerable electronics in the tent, but the nigh-indestructible flash-drive computers were still running. After shaking herself awake and checking in with Pups), Duffle ran a couple of spools of cable out to a remote antenna and set comms back up. HQ had noticed the explosion, but wouldn't be able to do proper BDA until the next overhead pass without drone involvement. Duffle wanted to make sure they knew that most of the team was still alive and to check on incoming orders. While she was able to receive messages, she was frustrated to discover that her attempted uploads continued to fail. For the second time today, technology was failing her. She flagged a passing corporal to carry a message up the lines the old-fashioned way- via handwritten note. "Adapt and overcome," the corporal agreed. "I'll let 'em know ASAP."

With nothing left to do, Duffle hobbled over to the remnants of her field office and started picking up the pieces. In a few months, she knew she'd be rotating back home to her family. Until then, she'd keep on keeping on.

---

That evening, Kao and Pat toasted their broken bird. In the front yard, Juniper staggered behind a push-toy shaped like a fire engine, babbling incoherently.

"Reverse Aces?"

"Reverse Aces."

In a few days, they'd both be assigned to a new team- still in the same office, but working separately for the first time in months. For now, they were still teammates.

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Janek and Aga wrapped up their shift with Streetlamp, and handed off to the next group of military mathematicians. Aga picked up her phone and checked her messages. A few dozen emails from friends, family and colleagues- the usual for anyone step out of a secured facility. Janek did the same, and started typing out his answers as they waited for the shuttle to take them back to their quarters.



Aga sorted through the messages, responding to her father about a family event, an old friend about dinner, and then stopped.

Janek was still staring at his phone, but hadn't moved or typed anything for several moments.

"You are alright?"

He shook his head, and proffered the screen.

"Janek, I don't read Estonian."

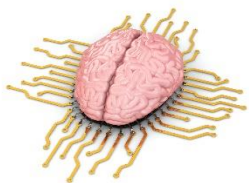
He shook his head again, this time to clear it. "My mother- she is saying they shelled our home. My brother is still missing."

"I'm sorry."

Their work was so removed from the violence and grime of the warfare of their parents and grandparents. Day in and day out, it was easy for them to ignore what it really meant, but all the precision targeting and machine learning in the world couldn't stop reality from intruding. It still hurt.

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Jenny Oberholtzer is a defense analyst and an erstwhile Persian/Spanish linguist. She is a graduate of the Defense Intelligence Scholars Program, best known for her work on cyber security and her red teaming in war-games.



The Platoon Battle Group  
By Topias Uotila

## Part 1

I envied the weapons of the KNPA. Compared to my platoon's bulky standard issue equipment the law enforcement had always been supplied with a more agile tool set. The low expected casualties and a fully professional force made everything from custom fitted handles and grips to shooter identifying triggers economical and feasible. Also, a lot of the artificial intelligence scanning the visible and the cyber environment and the augmented reality presentation layer had more nuance and finesse in them. Being able to model the variety of parties and threats we faced in the midst of the civilians, rather than just good old "us and them", came in handy.

Sighing almost silently I pushed my assault rifle with my right hand to get a bit more comfortable, allowed my messaging feed to flash over my vision and proceed with the interview. At least we didn't need translators in every squad anymore.

*CNN: Debate saw candidates arguing over a tougher foreign policy*

*Wife: Mike broke his thumb, but it'll heal perfectly. Call tomorrow?*

*Fox News: "Troop ramp-up will restore civilian society before end of month" says the President*

*History Channel: After DPRK nuclear incident was China's de-facto annexation the only alternative?*

The shopkeeper was certain that the same group kept stealing his and the neighborhood's other merchants' UPSs. The way she described the bandits made me feel she wasn't making it up and that they were likely professionals. No breaking up places, aggressive threats or wasting time. Sturdy, but not too big guys in their late twenties. Relatively few implants, tattoos or other body augmentations. Hell, they sounded just like the guy we had picked up an hour ago or almost anyone from my own platoon. Uninterrupted Power Sources were often in need, since most militant groups relied on electronics and electric motors for everything and blocking power to parts of the city was a common tactic. I concluded the interview promising little but encouragement and handed the situation to the KNPA representatives. I stepped out into the street.

*Me TO ALL: Ok, base stations, normal rota...*

*Corporal Stubbs TO ALL: PoW on the run!*

I remembered assigning another soldier to back-up Stubbs, but his dot was alone on my field of vision.



*ME TO ALL: Stubbs to pursue, use non-lethal force with minimal political effects.  
Squad leader coordinate autonomous assets. Other squads on stand-by.*

I switched to Stubbs' vision and the system replayed the last few seconds in double time. PoW had run off towards the border of our responsibility area leaving nobody on the platoon ready to intercept. I couldn't get a read on the PoW anymore.

*ME TO Squad 1 / KNPA: Our earlier capture on the run. Anyone in area D2 ready to intercept?*

*Squad 1 / KNPA: Negative. All my guys are in these stores.*

*Stubbs: Continuing in pursuit towards D2 via overpass.*

Roughly 10 % of our autonomous assets went offline and not too surprisingly in a very inconvenient direction. Basically, in two perpendicular streets of which either could be a logical route for the PoW to escape through. It would take a few minutes for the drone network to rebalance. I was certain the PoW hadn't disappeared from my system by accident, since Stubbs was still chasing someone with a visual contact. Knowing Stubbs couldn't be bothered with questions I simply tapped fully into his real-time feed and immediately my head gear pumped a small dosage of his hormonal experience into my body. Lots of adrenaline with a hint of fear, perhaps only for failing in his mission. Besides the goggles the injection point was the only constantly rigid part of the head gear that turned into a ballistic shield only upon impact.

The platoon had been given a back office cyber squad as an additional asset for the time being, so I ordered the two guys on duty to wake the rest of the team up and get the PoW back on the AR, assess, limit and stop the breach to our networks and get the autonomous assets back online. In that order of priority.

*Stubbs: Shot available after next corner.*

*Me TO Stubbs: Take it, if PR estimate less than .3.*

*Stubbs: Do not copy. Reepee...*

The sound broke and simultaneously my feed control was also disturbed. The social chatter started leaking on to the battle mode.

*W1fe: Please answer! I have a bad feeling about everything.*

*Johnny@home: DUDE – WHERE AR U? DRUNK!!1!!*

*Stubbs: Can not engage target. System giving out political ramifications estimate in the high 40s. Instructions?*

*Wife: Good night my hero!*

*MikeR: How about A(Stp->Fin)?*



*Fox News: President's game inside Korea's domSRK\*. politics is a quagmire that'll only ruin the rel\_\_ionship with China*

*Me TO Stubbs: Stay on pursuit.*

Giving more specifics to the drones for rebalancing the network, I could only reposition some intelligence assets and a Taser towards the right area. However, I wouldn't be able to target anything, since the AR still didn't identify the PoW.

*Stubbs TO ALL: Anybody seeing the object? I think he dropped from the bridge to the floor below and run inside the shopping center.*

Five seconds passed.

*Stubbs TO ALL: Can't see him inside either.*

*Private Marcioni TO ALL: Here neither.*

Right, Marci was the fellow that had backed-up Stubbs, but since they weren't supposed to sit on each other's laps, it hadn't done much good for an old fashioned runner. Browsing the highlights from his feed for the last few minutes showed he'd done the right things – keeping a constant distance and protecting Stubbs flank while taking away some route options from the PoW. Those things just hadn't been any good this time.

All of the systems were also back online. The cyber squad had identified a combined vulnerability in the commercial technology based platoon level service bus and the military proprietary application delivery platform. The bus had enabled running any content already deployed in the so-called app store. Pretty worrying, but quickly fixed with a virtual patch.

*Me TO Squads: Quick check-up: Has anyone any info on the PoW in their systems. Disappeared from mine. Report back.*

*Squad A: No sign of target.*

*Squad B: No sign of target.*

*Squad C: No sign of target.*

I dumped the data of our mission to HQ and issued stand-by orders with 4 troopers on watch, others eating, sleeping and generally taking care of the equipment and themselves. I decided to start with the sleep. Still had to build a report by highlighting most relevant areas of the data, but that could be done as long as 24 hours after the mission before it was all added to the immutable blockchain-based war log. I was sure to get some heat for using the new PRE-functionality with such low thresholds, but I was a lot more prepared to take heat from my superior than through a public outcry after, for example, risking collateral damage and failing.



## Part 2

No politician had talked about a war, but it sure felt like one inside Busan. Not your classic one with advancing armor columns, but a dirty gang war that you can't escape to catch two nights of good sleep ever. Busan is one of the five cities in Korea hosting 95% of the population. Second largest by far behind Seoul that had swallowed Incheon also administratively six years ago. I was leading the platoon that was in charge of the eastern waterfront area with a rough population of 300 thousand persons and size of 30 square kilometers.

The area was huge for a conventional platoon, but you could call us a battalion, if you counted the fire- instead of the manpower. For example, each one of us had on average about 5 microdrones with the whole platoon thus boasting a fleet of 250 UAVs. Roughly the size of your palm each one carried one to three different missions: live visible or thermal video, acoustic sensors, SIGINT focused mostly on NearField and older networks such as Wifi & Bluetooth, relaying platoon and company level friendly networks, NBC intelligence, laser target marking, kinetic anti-drone missions and so on. Naturally we only had capacity to direct them as a swarm with the network having its own AI to direct the actual position, routing and missions for individual drones.

Our own armaments extended to shoulder fired AT missiles with radar and heat seeking properties as well as command control and programmable flight paths. Indirect fire was available in a minute, could be directed with one's rifle or goggles, and we could strike with any kind of munitions from incendiary to mines to incapacitating gasses. Though, things being as they were, I'd be very surprised to run into a situation where I could use such assets, not to mention using a full rate of fire with several hundreds of rounds delivered in a minute. The current deployment was such that we'd left most of heavy vehicles at base, opting move with motorbikes and armored cars. Thus, we had also sacrificed a lot of firepower in vehicle mounted machine guns and a couple of newly minted rail guns. A small part we could utilize as remote controlled and automated sentries in critical locations. Luckily, the assault rifle we all carried packed more punch than ever with caseless smart ammunition able to auto-aim towards the AR highlighted target available in all kinds of basic varieties like hollow point, armor piercing and illumination.

Even with all the technology I felt that our war here was akin to the good old real wars of history. It was always about bringing the boots on the ground. Especially here the wasteland at the China – Korea border acted as a barrier for any big maneuvers. Background radiation from the accident made relatively clean vehicles stand out against the background.

*Bloomberg: Rare earth futures plummet with the launch of BioT's organic processors*

*ABC: Military Expert: "Gen. Gurns needs to look at Naval history for solutions in Korea"*





“Fleet in being”, the general said. It was a good analogy on what the fancy tanks, planes, missile launchers and everything were good for on the Korean peninsula. All the real fighting was in the cities, if you’d wanted to do a major maneuver on the open wastes you’d get spotted by satellites, radar, passive radiation sensors in thermal and radiation bands in a matter of seconds and blasted away with missiles and extremely long range artillery like rail guns and guided munitions. But everyone knew both sides sure had enormous amounts of assets hidden near-by tying the other force down as well. The only things moving in the area were small sensors with limited weaponry like laser equipped UAVs. The laser wasn’t strong enough to destroy most targets, but it made sure a heat seeking missile from another platform found its mark. The approach was good for defeating both stealth and armor as the drone was actually very small and cheap.

Space above the area was very analogous. The proper satellites were naturally visible, but everyone refrained from targeting them. However, the microsattellites on very low earth orbits kept running into each other by “accident” while simultaneously providing yet another method of surveying to area and keeping it empty. I knew some platoon leaders had gotten a full microsattellite equivalent under their command, but my request was constantly low on the priority service list as they didn’t see a fit for mission requirements. Neither did I, but space technology got me excited.

*WIRED: New Fallout set in Korea – Fact is stronger than fiction*

I remembered two really wild rumors about the area. First was that the Chinese had released a bacterium or a fungus into the area that was visible to some new sensor and you could easily spot anything that had not been around long enough to be overgrown by a tiny shell of the material. The other story was about either side having a huge tunneling project on going that could transport a full battalion underneath the contaminated area.

*Mike Fastow: On a leave for 4<sup>th</sup> of July?*

*ME TO Mike Fastow: Nope. Maybe X-Mas. Beers?*

*Popular Science: Hyper X 2 – How are they making hypersonic missiles agile?*

*ABC: Domestic policy has disappeared from the election themes*

I tagged lieutenant Xian to be the acting platoon lead and started eating.

During the following weeks, the situation had first gotten so mellow, the guys at HQ had already worried hostiles were withdrawing to cut the juice from all of Busan. Things had luckily, if you can say so, heated up pretty shortly afterwards. Our normal days now included actual shooting matches and disarming boobytraps and minefields instead of just intelligence gathering and co-operations, e.g. babysitting, the police. Opposing elements seemed to be trying to disrupt the functioning of the city and score easy kills from our guys for PSY/INFOOP material. Luckily I still had everyone alive. We’d lost the subjected cyber squad, since those guys



had now a full war on in their domain. I suppose helping us with our lives on the line wasn't as important. On the other hand, the back office doing intelligence had even gotten better and we got a real-time threat model running on our field of vision showing the overall danger level and areas of increased risk.

*CNN: China claims wide power outages at the same time West Coast went offline*

*Wife: We're baking today. Your favorite. Miss U!*

*ABC: Military confident they are ahead in the cyber capabilities*

*CNN: Latest polls show trust in government at its low point in 3 years following the Intoco releases*

### Part 3

Our next mission started with a fire in a metro tunnel. The police were directing traffic away and the firefighters run towards the scene, when the entry tunnel exploded, collapsed and killed three of them. I immediately saw that the KNPA personnel started taking firing from several near-by buildings. Conveniently their positions were located between my squads A and C.

*Me TO ALL: Squad A move towards the explosion area. Clean the area of hostiles. Shoot for effect. Squad C suppressive fire for Squad A. Reposition to utilize effectively all fires. Squad B reposition to cover for gaps left by A & C. PRE-limit upped to .7.*

*WEATHER: Overcast. Probability of rain at <1%.*

Collectively our sensors could initially identify ten shooters, all of which seemed to be actual persons with guns in their hands. The data matched with what we got through HQ from their own and 3<sup>rd</sup> party sensors and intelligence assets including breached hostile networks. The first three were easily taken down as Squad C opened fire. At least one of them most likely died. This and the other suppressive fire already had the effect of making the police and the firefighters a lot safer. They could both focus on their job. I got to approve the KNPA's evacuation route for the civilians and made it visible to the squad leaders. Squad B moved closer to help maintain security of the path. The whole platoon was for the first time since deployment less than 2 kilometers away from me.

Enemy clearly started to reposition themselves and it became harder to keep count of them. Most likely at least two new guns joined the battle. Even with all the tech I felt I needed to get my eyes on the battlefield, so I took an elevator upstairs. Looking towards the metro station, the fire was still spreading and there were smaller explosions every now and then. The roads south were more or less blocked with the waterfront limiting that direction anyway. Squad A had taken a south-eastern route and was approaching the center of the enemy positions from



that direction. Squad C was on the west flank in a staggered line with almost everything in a firing position. The enemy was in a semi-arc to the north and major part of B was towards the east next to the outpour of civilians.

All the AI functionality was online, but it was responding a bit slowly, when I received a dose of hormones to induce caution. You weren't supposed to say fear, but it felt the same. I needed to think fast, but hard. There was something bad in our situation, but I didn't know what. The AI obviously only had a bad hunch. I didn't have time to reach an analysis or issue new orders, when it all hit us simultaneously.

Two bridges collapsed near the civilians' evacuation path cutting the Squad B in half in a torrent of panicking masses. My AR went full bright hurting my eyes in the night and I had to flip the goggles off.

*Me TO Squad C Leader: My AR down. Your status?*

*Squad C Leader: AR just flashed. Can't see rite even without it.*

*Squad C Leader: Fire from west. Repeat from west! Somebody is behind us.*

*Me TO ALL: Squad A take cover, continue engaging the enemy. Squad C reposition to direct fires to west as well. Squad B what's your status?*

*Squad B Leader: Status unknown. Can't reach most of my guys with comms or by physical access.*

I had to keep cool, but it looked like we were the main dish for the biggest move in the city so far. I looked out the window at the area and started to develop a plan. I watched as block after block of buildings went dark. Damn, they were also cutting the power and we'd run out juice for critical assets such as the sentries and night vision pretty fast. Time to call HQ.

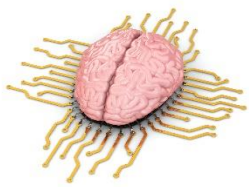
*Me TO HQ: Are you getting the data?*

*HQ: Yes.*

*Me TO HQ: Any chance of using some of those indirects without PRE-limits?*

*HQ: Negative. Our model shows that your best option would be a withdrawal. We'll send quadies from the 33<sup>rd</sup> Air Cavalry to the crossing at point 356-96. Note that we'll also takeover your drone fleet to ensure the enemy can't utilize AA. How much time do you need?*

After a short argument 15 minutes was all I got. Good thing was that Squad B got their comms back up and everyone was accounted for. Although one of guy had been killed already. The four troopers on our side of the collapse were the first I ordered to go secure the landing area. They still got a sentry to help out, even if HQ had taken away our drones.



Using smoke and teargas I got the PRE low enough to use the indirects on the buildings with the initial shooters and then on the west side of Squad C protecting them from the new threat as well. The smoke had very good characteristics for blocking all sensors, but they continued to shoot us too effectively by recon micro-UAVs and audio sensors. I was angry at myself for failing to ask for crackling smoke too. Teams A & C had both lost three troopers with one of them being Squad A's leader. Most of us got our AR back online, if they simply had enough battery left, so I took direct command of Squad A's guys. They had to protect C moving almost through them to the point 356-96, which was a tough maneuver to handle. Always the bureaucrat I noted that ordering them to simply cease firing for the pass through would certainly get extra scrutiny in the post-battle assessment.

*Me TO 33<sup>rd</sup> Air Cavalry: Does everyone have a seat?*

*33<sup>rd</sup>: Yes. But we'll need to do the pick in two parts.*

*Me TO 33<sup>rd</sup>: What happened to automatic distance control formation flight?*

*33<sup>rd</sup>: We're using it to the max. It's just a crossroad for crying out loud.*

On the landing site, the number of drones was significant. I could actually see them positioning themselves as screens ready to employ measures for anti-missile ultimately even positioning themselves on the flight path. Squad C started arriving with fire on their heels at the same time with the first quadie and were directed straight in. It was a lot easier for the guys from B with their sentry to keep the pursuers at bay. The small arms fire was of no harm to the quadies and we got the rest of the platoon on to the next pick-up in a minute. Had to abandon the sentry, but not without taking all the intelligent parts with us. I was naturally the last one on a lift. Presumably flying towards the Busan HQ with two of the rotors already tilted for cruising, I allowed myself to glance at the feed.

*CNN: President-elect "Agreement on de-escalation in Korea with the Chinese leadership"*

*BBC: USA bringing their boys back home*



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## The Turkish Emergency of 2042: Of Werewolves Horseflies, and, Armadillos

By Jeff J. Tlapa

Captain Vasquez sat in the tiny cafe sipping a black, silty coffee from a delicate demitasse cup. His linen suit and thick mustache belied his affiliation with 3rd Squadron, Zeta Group U.S. Special Operations Command (SOCOM) much less the U.S. Army. In fact, he couldn't recall the last time he had worn his uniform since his promotion. He pretended to look preoccupied with the local news and webweather forecast unfolding on the Samsung VidTable in front of him though his focus was on the building across the street. Vasquez was momentarily distracted by his reflection from the table. He was still growing accustomed to his latest camoplas "pattern." The plastic surgeon had added 35 years to his 29 year old face. It was effective but his wife, Karen, hated it saying he looked like a "dirty old man." The hustle and bustle of commuter and work traffic in Istanbul had subsided, the call of the muezzin from the Blue Mosque pealed in the distance, and a darkening sky offset by a twinkling nightlife had replaced it. It was hard to believe Turkey was in a self proclaimed state of war, had asked for an Article 5 declaration, and that NATO was on full alert.

United Russia was on the march again after its successes in Georgia in 2035, Ukraine in 2038, and Moldova in 2040. It appeared that Turkey was next after a recent coordinated attack in Ankara using a combination of sleeper agents, its Patriotic Cyberfront (FKP), and *Oboroten*. Vasquez had seen this first hand two years ago in Chisinau on a protection detail for the Moldovan Prime Minister. In Moldova, the Russians had unabashedly used their *Oboroten* or "Werewolves" to attack political, religious, and critical infrastructure targets. Since Moldova was not a NATO member, Vasquez was "asked to temporarily reassign to the clandestine services" in order to conduct the mission. It was the fifth time he had freely crossed between DOD, the Department of Intelligence (DOI), and DHS using the Defense and Security Talent Management Program. He disliked the idea of working under the circumstances of plausible deniability but DOI time helped with promotions. The mission in Moldova had been a nightmare and he had to conduct an "old school" E&E (escape and evade) through Russian occupied Ukraine to Poland with zero help from anyone in the US government. "That was an ugly scene," he recalled and was glad to once again be in the warm embrace of DOD on this mission.

Moldova was the first time he had faced Obos in combat and he found them to be simply amazing in every regard. Genetically modified humans created to provide superhuman performance in strength, pain threshold, dexterity, and reaction time - the Obos were fearsome. He watched one kill four Moldovan bodyguards with his bare hands and soak up gunshots like mosquito bites. Vasquez felt lucky that although the U.S. refused to conduct similar experiments, they did provide him with an impressive array of biosystems giving him a technological edge that put him close to par with these freaks. Congress had approved



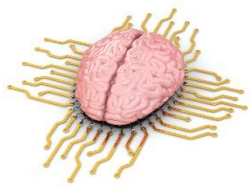
biosystem enhancements for DOD, DHS, and DOI personnel through the National Biologic Security Act of 2029 . Executive Order 50234 outlined the mandatory reversibility of all enhancements and their removal from operators before separating from the service. This order was issued to allay fears of "scifi cyborgs" and maintain a semblance of medical ethics. The Russians and Chinese had no such qualms and took their organic defense programs to a point of a freakish horror video.

He "flicked" through his combat display, still working through his familiarity with his recent upgrade. The nanochip he had surgically implanted enabled a neuro-user interface (NUI) that provided him with thought messaging, targeting data, threat indicators, intelligence feeds and reachback capability -- all simply by thinking about it. The NUI also enabled a retinal up display, or RUD, which provided all of the NUI feeds but conveniently displayed them wherever Vasquez looked. The RUD had two way updates which not only took advantage of intel and ops feeds but essentially turned Vasquez into a sensor as well. He currently had the NUI in private mode so that he had agency over his own thoughts, but he lost all expectation of privacy when switched to combat mode. Despite the challenges with privacy, for combat purposes he felt the minimally invasive surgery was worth it as this system was much better than the helmet mounted version that he had used in Ukraine years earlier. He instinctively "glanced" at the synch with his smart pistol making sure that the targeting data flow was sufficient. Normally, his Glock 103 was his "backup gun" but here it was his primary. At least he had the latest update for his General Dynamic nanobullets that took targeting info from his RUD. He would have preferred carrying a chemical plasma gun but they were just too bulky for an undercover job like this.

Together with Sandia National Labs, General Electric stumbled upon directed plasma energy in the late 20s in an effort to develop a clean, renewable energy source. Instead of clean energy, they discovered it made a fantastic weapon. GE made a fortune through its new subsidiary, GE Defense, arming vehicles and drones with "plasma cannons" and making tanks obsolete in the process. Science eventually yielded smaller rounds but the chemists, physicists, and material engineers just could not shrink it down to something concealable. He had carried a 35mm plasma gun in Ukraine and liked the surety of a kill when you shot something. The rounds were about the size of a toilet paper tube so a revolver design was the most practical making the MK III look like an overgrown Colt revolver from the Wild West, only with a buttstock.

In addition to his smart Glock, Vasquez carried a case of multispectral obscurants disguised as a pack of cigarettes, a flashlight shaped microwave burner giving him a non-lethal option, and a N2EMP grenade. The N2EMP was known to operators as a "crisper" - essentially a non nuclear electromagnetic pulse device the size of a golf ball. He wasn't a fan of the crisper as it would in all likelihood fry his onboard systems, but his experience in Moldova had shown him that it was very useful to help mask his escape if required. He squirmed a little inside his body armor underneath his silk shirt. The extra four pounds of the liquid armor vest always chafed him and weighed him down. Natick Labs promised a lighter version soon but of course the loss in weight would be replaced by some other gizmo dreamt up by DOI or Special Operations Command (SOCCOM). A threat indicator on his RUD blinked at the same time a





news streamer on the Samsung table top indicated an expected spike in webweather. The Obo he was surveiling was on the move, probably using the increased activity and disruption on the internet to help mask his intent.

"Good thing the NSA feed can cut through," he thought still in private mode. Vasquez group messaged "TASK FORCE: It's Showtime," to his teammates Sergeant First Class Tom Grainger and Chief Warrant Officer Lauren Boorstin as well as cc'ing the "Heavies" that were on standby. The Obos were extremely lethal so the combined joint special operations task force (CJSOTF) had a reaction force of "Heavies" made up of Polish Special Operations Cavalry on standby in case things got very ugly. The mission briefing outlined this operation to protect the Sultan Ahmet Mosque as a high visibility, low observable event. The negative outcomes of a strike on the mosque would be terrible but discretion in protecting the site was important as well. His three person Alpha team was to intercept and neutralize without collateral damage, much less a news story. Vasquez furrowed his brow as he contemplated the dichotomies of this mission profile, especially in a highly populated area. Also known as the Blue Mosque, DOI confirmed that Spetsnaz Command had the ancient structure on a strike list to follow up on the Ankara attacks. Clearly, a strike on the mosque was a violation of the Law of Armed Conflict but history had shown Russian ambivalence in previous actions in Ukraine, the Third Chechen War, and the Syrian Civil War. Though the international community condemned these acts, Russia typically either claimed that belligerents had violated the protected status of these structures or denied its direct involvement. Employing Obos implied the latter.

"TASK FORCE: Target on the move. Standby for positive ID," thought Vasquez immediately sending the message to his teammates. The target was a powerfully built man with long black hair in a ponytail. He emerged from the building across the street and started walking briskly toward the Sultan Ahmet Mosque. The Russians had been much more discrete in Ukraine but emboldened by their success there and in Moldova, now they were employing their new "weapons" more openly. The Obo's long black RFIDsafe jacket provided good concealment for body armor and weapons as well as his personal data. Vasquez tagged him as "Ivan49" and forwarded the targeting data and intel feed through the orbiting Archangel drone. Grainger and Boorstin both "followed" his tag. *Kapitan Sobczak* with the Polish "*Husarski*" (as they liked to be known) added his team's targeting icon to the tag. The image of the Obo transmitted to them as well as to the Heavies. He was a mean looking one - On the small size for height but he was thick and probably "juiced" on chemical enhancements as well.

"I sure hope we can do this quietly. The Turks will have a fit and the market is going to tank if this gets out of hand," thought Vasquez. He was still a little distrustful of the NUI and believed that it was nobody's business what he was thinking until shots were fired so he elected to stay in private mode. "Lola," his onboard artificial intelligence assistant, would override to combat mode as soon as "she" detected a number of preprogrammed protocols. Ivan49 had dodged into a alleyway and then into a crowded bazaar to avoid being trailed. Unbeknownst to the Obo the National Security Agency had several biodrones, NUI equipped horseflies, tailing him. These insects had a combination of genetic modifications as well as nanochips similar to the one Vasquez had though much less capable due to size. The flies were optimized for clandestine surveillance and were good at it. The entire task force had the flyfeed. Fly7 landed



on Ivan49 taking a DNA sample by biting him. Before the Ivan49 smashed Fly7 with his incredible reflexes, it had transmitted DNA info to Bethesda via the Archangel drone. Three seconds later, Biointel at Bethesda confirmed genetic enhancements consistent with *Oboroten* biotech and signaled the taskforce regarding positive ID.

"TEAM: PID on Ivan49." Vasquez purposely excluded Sobczak not wanting to encourage him to race in just yet. The current rules of engagement required both positive DNA identification as well as hostile action or intent. Although Ivan49 had destroyed Fly7, the other biodrones Fly2, 4, 17, and 48 were still tracking nicely. His RUD showed his teammates in position to intercept as he pursued Ivan49. The flyfeed continued to provide Vasquez with excellent awareness. He was glad he didn't have to operate the flies and that someone back in Maryland was piloting the insects as a sensor cloud together with the Archangel. Fly2 and 4 both suddenly disconnected. Something didn't seem right as he got a strong whiff of insecticide. He felt the shock of two slugs hitting his liquid armor vest and spun around to the ground as a third ripped through his left bicep. The liquid armor reacted to blunt trauma changing from a liquid to a solid at the point of impact for a full .37 seconds distributing the impacts in circular and rapidly slowing waves across the entirety of the vest. Once the kinetic energy was stabilized, the solidified armor shifted back to a liquid in under 2 seconds. "Lola," recognized the shooting as one of her override protocols switching his NUI from private to combat mode making all of his thoughts transmit automatically. She also automatically initiated emergency communications to notify Turkish military and police of the incident as well as the operations center at SOCOM and the entire CJSOTF. The last part bothered him. Sobczak would be on his way and he was anything but subtle. This was going to turn into a circus very quickly.

He locked eyes with the Obo as he started shooting his Glock 103 through his jacket pocket. Aiming was unimportant as his RUD's targeting feed was transmitting directly to his pistol, supplying 3D coordinate information for Ivan49's left eyesocket. It really didn't matter which one but Vasquez was right handed and Ivan's left eye corresponded more easily. The pistol bucked in his hand but made no more noise than a socket wrench. The guided round impacted Ivan's skull. The left side of his face erupted as the round's explosive warhead detonated and threw him to the ground. The Obo dropped a can of Raid Hornet Killer but retained the machine pistol in his right hand.

"[C] TASKFORCE: A four dollar countermeasure for a \$40K biodrone," thought Vasquez. "VASQUEZ: What's that?" asked Boorstin. Vasquez cursed the override to combat mode and ignored her, focusing on his immediate problem. He had made a solid killshot. Only Ivan49 was still moving. The crowded bazaar erupted in screaming and panicked people were running away, flashes from camera's recording the event live. He'd check his exposure rate when things quieted down, but he was sure he would be ID'd in personal and global media. Karen would be pissed that they would have to CLM (Cover Loss Move) again just after four months and he'd need another round of camoplas on his face.

Vasquez' RUD showed the Poles on the way - about 32 seconds out. In disbelief, he shot Ivan again in the right eye, nose and Adam's apple - a classic triple tap but not before Ivan49 let



off another burst from his cut down and suppressed Avtomat Tula. The subsonic 12mm slugs again impacted his vest and now his left forearm. Vasquez just hoped his trauma immunizations worked as well as the medic assured him at the clinic in Germany. A combination of adrenaline-initiated vaso-constrictors, platelets, and endorphins began to release throughout his blood stream, slowing his wounds to a mere drip. The Obo was down but there was something definitely wrong about this guy. That first shot should have put him down. Vasquez coughed from the blunt trauma to his thorax and blinked through the endorphins, thinking that Ivan49 might still be a threat. He looked at Ivan who was still breathing, yet oozing blood out of his head and neck. The gleam of metal shone through the blood and skin of his forehead. Special Operations Command recommended using only headshots on Obos due to their high pain thresholds and body armor but BioIntel at Bethesda had warned about the Russians augmenting their Obos with armor plate in critical places. It looked like this Ivan had parts of his skull replaced with armor. The surgery and recovery for that had to be painful. Of course, this guy had most of his pain receptors deadened so it probably didn't matter. Vasquez couldn't imagine going through the type of surgery and treatments that this Obo did painfully aware of the plastic surgery he had to endure after every mission compromise.

"[C]TASK FORCE: This guy just won't quit," he thought as the Obo started to rise up on all fours. He was about to empty the Glock into him when the Ivan flashed open. Sobczak interpreted Vasquez' thought message as "threatening" and took command override of the Archangel drone overhead to finish the Ivan with a chemical plasma round. Vasquez was glad his IFF (Identify Friend or Foe) was still working. Had he bled out enough, the lack of electrochemical balance in his bloodstream would have triggered the self destruct to fry his nanochips and IFF to prevent their capture and exploitation causing the Archangel to blast both him and the Obo. Of course that would have been the least of his worries. To get to that level would have meant that he was dead anyway. Vazquez scanned his immediate area, checked his RUD for his teammates, sent them a message to keep their eyes open, and tracked the arrival of the Heavies. The *Husarski* were still about 29 seconds out. He looked around and snatched up the Tula. The AT-25 was an older gun and would be hard to trace a direct connection with Russia. He checked and found no palmprint biometrics. This was good in that he could use the gun but bad because it meant Ivan49 was not alone.

"[C]TASK FORCE: Obo team likely!" The Russians had not been able to graft multiple biometrics on a single gun, so *Oboroten* teams numbering between two to four operatives went out with unmetered guns. His RUD indicated 21 seconds until arrival of the Heavies - a lifetime when fighting *Oboroten*. Fly17 and 48 were still reporting - no sign of any other Obos. Grainger messaged him, "VASQUEZ: Roger on Obo Team. Beers are on you when we get back. I told you that you would get nicked again."

"TEAM: Shut up and focus, there's another Obo or two out here." Boorstin confirmed his suspicion by tagging another combatant as it popped up on the RUD with a new icon, "Katya14."



"[C]TASKFORCE: 18 Seconds out," chirped Sobczak. Katya14 was moving fast toward the Blue Mosque and using civilians as cover from the Archangel. He could see Sobczak vectoring one of his two *pacholiks* to overtake her. He began to message Boorstin and Grainger to intercept but his signal cut out. It had to be the FKP, and of course right at the critical moment of the operation. The RUD kept up with the targeting data but they were out of comms. "Hacking attack. Firewall at 13%" said Lola in her sultry voice. "She" had detected a massive spike in hacks against the onboard firewall and when the firewall was reduced to 10% she automatically dropped the digital portcullis protecting Vasquez' onboard systems but essentially rendered his comms inoperable for the time being. Vasquez was mute but not blind and so he moved to support, limping along from the trauma. The RUD showed Grainger protecting Boorstin's flank as she moved to intercept. They would all be working off of intent and implicit understanding of each other's movements and actions at this point. Katya14 blinked indicating an engagement, probably with Boorstin. He had to move to help her.

New icons for Ivan56 and Ivan57 appeared on the RUD. This was clearly more than his team had bargained for and now he was glad the *Husarski* were only seconds out. It would be messy but they had to stop this attack. He saw the flash as four rockets arced through the sky towards the Mosque. It exploded mid air as the Archangel intercepted it with countermeasures. The other Ivans probably had several Rogatka-2s, a rocket pod worn like a pack. The rockets were given target information and reprogrammed through a link from a weapon mounted laser sight or through voice command. Vasquez had been on the receiving end of a Rogatka armed squad in Ukraine and he had a lot of respect for how quickly they could spew death in so many directions while a unit was moving and communicating. Simple but effective, the Rogatka were the weapon of choice across the developing world, much like the RPG during the 20th century. He knew the Archangel's loadout and at the rate the Obos were firing, the Archangel would be "Winchester" (out of ammo) very soon. This was going to be tight.

Three more rockets traced up from the Ivans and also exploded in midair. Tonight was starting to feel like Moldova all over again. The Poles arrived like the cavalry they claimed their lineage from, firing Rafael nanorocket countermeasures skyward from their Pancernik-30s to intercept the barrage of Obo micro rockets. Born from a joint venture between Polska Grupa Zbronjeniowa and Saab, the Pancernik (literally Armadillo) was a unique armored vehicle about the size of a Jacuzzi hot tub and shaped like a gigantic oyster with wheels. Operated by a single soldier, the Pancernik was extremely fast with speeds up to 90mph and relied on armor protection from layers of a classified composite alloy known only as MBS-7. The combined tensile strength of MBS-7 and the sharply angled exterior ensured a .92 probability of a ricochet when fired on with projectiles up to 155mm. Equipped with plasma cannons, nanorockets, adaptive camouflage, and STANAG human interface command and control, these vehicles were the last of their kind in Europe as all other member nations had abandoned armored vehicles in the face of such a lethal battlefield. Traditions die hard and the *Husarski* were proud of their singular role as the elite armored force within NATO. Each of the nine Pancernik-30s rolled in, their unmistakable brutish forms emblazoned with the Polish red and white. Sobczak was proud to be Polish and represent the second largest partner in NATO. Oddly, their coloring



complimented the Turkish police who also showed up with the same color of livery on their vehicles.

"Maybe no one will notice the difference," mused Vasquez in private mode knowing otherwise. He checked his public affairs exposure rate and counterintel forensic feeds. This activity was literally an "exploding trend" on local media with over 7,000 hits and the global trend line looked to extrapolate to 250 million in the next 3 minutes. Three news drones had already been shot down by the Pancerniks by accident by their autonomous countermeasures toggled to "weapons free." The Turks formed a cordon around the grounds of the mosque while the Poles bored in on the two Ivans. Katya14 went "red" and was fading, indicating that Grainger and Boorstin had neutralized her. Meanwhile, both Ivans were still bright green. That would change soon. Vasquez recognized the weird glow of the chemical plasma rounds fired from the Pancerniks. There would be no forensics on any of the Ivans after this as he watched both of their icons rapidly shift from green to red and then fade to black.. Hopefully, Boorstin was exploiting the Katya and by her location on the RUD it looked like she was. It was Grainger he was worried about. He hadn't moved for a while and the FKP attack had blanked out his life support status. "Lola" announced "incoming suppression" from USCYBERCOM and in addition to the portcullis she now raised the digital drawbridge, a shutdown of the entire feed to prevent Vasquez' nanochips from being corrupted. A lengthy two seconds later, his RUD rebooted automatically and the FKP attack had subsided for the moment. "TEAM: Report status," he messaged to Grainger and Boorstin.

"[C]TASK FORCE: Grainger is down! MEDEVAC on the way!" replied Boorstin, "VASQUEZ: Initial forensics complete on Katya14. Encrypted data pack on its way to Bethesda. Bio samples secured for transit. Nothing left of Ivan56 or 57 to check." Vasquez ran/hobbled to Grainger's position. The Pole leading this section of cavalry was already on scene. Although he was combat locked in his Pancernik and unable to assist the casualty, he and his two "slaved" Pancernik ground drones established a perimeter around Grainger, shielding him from the remains of the Ivans. A fully armed Saab *Orn* drone, also "slaved" to the Pole, circled overhead. The sum total of firepower, mobility, and situational awareness of this Polish cavalry section was on par with a battalion of armored cavalry 50 years earlier.

Vasquez checked Grainger's vitals - he was still alive but barely. The trauma immunizations were the only thing keeping him going. Vasquez slapped a heart patch on his arm to keep his circulatory system working until the MEDEVAC arrived. "TASK FORCE: Dustoff7, ten seconds out," said a calm female voice through the RUD.

"They must have launched the MEDEVAC as soon as I started shooting," he thought switching back to private mode. Grainger would make it with that sort of response time. He looked up as the quadcopter MEDEVAC drone approached and touched down on the mosque lawn area. "TASK FORCE: Dustoff 7 ready for immediate liftoff."

"Someone is going to bitch about that for sure," he thought as he and Boorstin carried Grainger to it and loaded him in the patient tube and zipped him in the trauma bag. The bag immediately inflated and began diagnostics and trauma treatments to stabilize him until the drone could land at the hospital. "ALL TASK FORCE WITHIN 10 METERS: Clear the area!"





warned Dustoff7 as Boorstin and Vasquez moved away from the drone. The turbines whined under the added weight of the casualty and then slowly lifted off and headed to the east.

"Did you call in the MEDEVAC?" asked Vasquez aloud.

"VASQUEZ: No. Sobczak did. Do you want me to call in another?" messaged Boorstin as she looked at Vasquez' wounded arm.

"No, I can make it with the extract from the Poles," said Vasquez aloud again. "And dammit Lauren, switch to voice when we are this close," he said in irritation. "Sorry," replied Boorstin. The area was a mess and the Turkish police were quickly taking charge of the area. Sobczak pulled up alongside the two operators.

"VASQUEZ: Please allow me to give you a lift," he messaged from the cupola of the Pancernik. Vasquez nodded and climbed into the cramped extract compartment in the back of the Polish armored vehicle. As soon as he buckled in, it lurched into speed putting distance between them and the combat scene. He pulled a combat trauma sleeve from the first aid kit and zipped it up over his left arm allowing it to inflate, analyze, and treat the injuries with a variety of drugs, blood plasma, and pressure.

"SOBCZAK: Thanks for the assist. Four Obos was a lot to handle." In response he only got a thumbs up icon. Vasquez just shook his head. "Not even a message" he thought in private mode. He continued to monitor Grainger's status and was relieved to see him go from critical, to guarded, to stable, all in midair. Vasquez put in a call to his parents in Iowa. His next Officer Talent Report would be riding on his beating the media to the punch. He wanted to be the first to tell them that Tom had been wounded but he was doing fine and would probably be home in a week or two. He would have to eat crow and settle his bet with Grainger about the "nick" but Tom would certainly be a lot less cavalier about it now that he would have his own Purple Heart and the scar tissue to go with it. He looked out the armored vision slit and saw the Blue Mosque in the distance. The lights illuminating the United Nations World Heritage site never flickered once during the entire battle.

"I suppose that's a measure of success," thought Vasquez as he waited for Grainger's folks to pick up the link.



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## What World May Come By David Glenn Williams

Dustee's vision was a kaleidoscope that both soothed and horrified her. She floated. Her mind expanded, stretched, contracted, and struggled to render meaning to this experience. She was now, but tomorrow and yesterday simultaneously. *How is this possible?* she wondered. The anchor of time was lost, and she felt transcendent as though her mind stood upon the precipice of unlocking some great universal mystery.

From the edge of her consciousness, Dustee felt a tremor. It was in her . . . she could not conjure the word-image. Her mind slowly formed the idea of a body. Yes, it was her body. The tremor persisted until it became a rhythm. The buzzing grew to a pulsing, building as the lights and colors swirled into a massive vortex that she could no longer see nor touch, only feel. It spiraled rapidly as the pulse began beating harder and harder. Dustee snapped awake.

Her heart pounded against her ribcage as her blurred vision came into focus. She dry-heaved several times, her pale skin glistening in cold sweat.

"I am Colonel Dustee Reiker, and I am on Earth."

Reiker had been called back from Lunar Outpost 3 only two weeks ago, and the effects of space travel and the gravity change were disorienting at best. More than the physical challenges, she was struggling with the mental and emotional effects. She felt disjointed from herself and separated from others in ways that she could not describe. Undoubtedly, the ghosts of combat from her earlier years played a part too.

"Colonel, sorry to disturb you." It was her executive officer, Major Mike Yi. She had not heard him enter the room.

"What is it?" she groaned, forcing herself to forget her thoughts and focus on the now.

"I've got the 0600 reports from the field battalion commanders ready for you," he said.

Turning to look at Yi, Reiker replied, "Set up the holoprojector and give me five minutes."

Yi exited the room and could be heard giving direction to the headquarters personnel and AI integration units to set up for the briefing. Reiker gathered herself. She rubbed her left forearm where the bioimplant was that linked her body to her "skin suit", in infantry vernacular. Despite what the doc said should be happening, it still irritated her skin, and she wasn't entirely sure how this biological integration, this blending of technology with her own body was affecting her.

Nevertheless, Reiker had to admit there were advantages. The skin suit was constructed out of graphene with an interconnected series of wiring harnesses, sensors, and neural microcircuits that made it a sort of second skin after the biolink was implanted and activated. It was a fairly complicated thing to produce, maintain, and repair, not to mention expensive. Only the governments that survived the Russo-NATO War still had strong enough economies to afford them. As the brain and body adapted to the suit and biolink, they developed a sort of symbiotic relationship. The wearer needed only to think the word "shield" and the transmitters realigned the molecular structure of the suit to harden it against bullets and shrapnel. The miracle of the suit, though, was that it still remained flexible and lightweight enough for a soldier to continue moving and fighting even as the suit's microfibers responded to thought.



Add the tech attachments and variants and soldiers could shoot, move, and communicate in ways that made them “strategic corporals” beyond anything a 20<sup>st</sup> century military thinker could imagine.

The psychs claimed that the biolink’s presence would fade as the soldier gained experience with the suit. What effects the biointegration had on a soldier’s mind and body over time – well, no one could say. Or, at least no one was saying. NATO had a Veteran’s Department for this sort of thing, but it was chronically underfunded and nobody really believed it would help. It had been a year since Dustee had the implant. She was an old-school hold out who waited until her assignment to the lunar outpost required it, but she still felt it there, useful but unnatural.

Yi poked his head in. “Colonel, holoprojector is prepped. Whenever you are ready we can knock this out.”

“Roger. Let’s go.”

Reiker fastened her skin suit and activated her ocular implant, an eye prosthetic that enhanced natural vision, networked with local wireless systems for overlays and targeting, accessed and projected data from the Holmes system, and provided night vision and infrared. Another curious blending that didn’t feel quite right to Reiker, but again, she had to admit that the implant beat the older style goggles, with all of their batteries, maintenance, and accoutrement, that she grew up with in the army. She felt the slight ripple across her body as her suit activated, meshing with and strengthening her tired muscles. Yi activated the holoprojector and a 3-D image of the operational area came to life for everyone to see as Reiker stepped into the room.

“So, what’s the current status of the field battalions?” Reiker inquired as she glanced across her staff noting their tired but determined faces. The same faces of soldiers throughout history. Grim, determined, hardened to what they faced and what they had to do.

“Pacification efforts have been successful in this sector thus far. All field battalions report 95% strength or better on personnel and equipment. There has been very little enemy contact. Units are collecting on information requirements, and we are feeding indicators into the Holmes to assess the SOTE group’s next move.”

Reiker scanned the projection, noting the positional icons of her battalion and company commanders across the battlespace. Next to each leader icon was a display of pertinent data. As Yi continued with SITREPs, Reiker touched each of the battalion command icons, one after another, accessing vitals provided through the networked skin suits. All of the commanders were getting enough nutrition and sleep it seemed, except Logan. She mentally filed this away determined to speak to her about this later. Yi brought up the intel overlay, and Reiker studied the terrain projection and enemy predicted activity over the next 24 and 48 hours from the Holmes. *I miss having a human intel analyst*, she thought.

“Ok. I understand what Holmes is predicting and that it’s quiet out there for now. But, what does it *feel* like out there?”

She could feel a wave of tension flow through the room as soon as she asked the question. Many faces fell to the floor and glances went astray. Reiker’s staff always felt uneasy about this distinctly human, and thus flawed they assumed, idea that she had continuously emphasized since her arrival. They couldn’t understand why she didn’t just trust the Holmes, a fully



integrated computer system and massive database that had evolved from the early 21<sup>st</sup> century Watson machine developed by IBM. The Holmes analyzed billions of data points from all across the world, monitored hundreds of thousands of media sources, ran algorithms, and fed predictive analysis into the AI units used by governments, militaries, and corporations across the developed world, and now even to the Lunar Colonies. Users simply applied their own filters applicable to their vocations or environments, but the Holmes was increasingly the brain behind all decision making. Reiker's staff was young. *They've known this way of doing things their whole lives*, she thought.

"Feel?" Yi replied pulling Reiker away from her thought. "Yes, well," Yi stumbled through the words as Reiker's expressionless gaze bore down on him. "... I mean, the commanders report the situation being just like we assessed during the planning ...".

"No! That's not what I mean," snapped Reiker. Her staff slightly but visibly shifted away from her as if to avoid her questions. "How does it *feel* out there? Are kids around when we patrol or are they running away from us? Does it seem like the locals are telling us the truth? What does their body language suggest? Do things seem out of place? Are the little hairs on the back of your neck standing up when you move through sector? I've said this before: technology is great, and, yes, it informs our decisions, it even enhances our natural abilities, but by God, a commander has to *feel* the space around her to know what her adversary is thinking! A machine can't do that."

"Colonel." It was the AI unit, Daisuke. Military AI units were the physical presence of the Holmes. There were various models, but they had arisen from the need to help humans trust the Holmes machine. Each generation of AI mimicked human behavior and expressions to a greater extent. Daisuke was the most human like edition yet right down to speech pattern and facial expressions, but its eyes were still glassy and hollow, soulless. Reiker believed that one day in the not too distant future, another human generation perhaps, no one would know if they were talking to a person or an AI. Maybe the AI wouldn't know either. She didn't fully trust the integration of the AI, nor did she care for the increasing amount of reliance her staff had upon these units. She thought, *if we give the brain work over to them, then what becomes of us?*

Fighting the urge to roll her eyes and sigh, Reiker turned towards Daisuke. "Yes?"

"Colonel, as I have stated before, this feeling you describe is fallible. By collecting on our intelligence priorities through an integrated network, you provide more data points for our algorithms to predict enemy behavior. This is not the Russo-NATO War you experienced in your youth. There are simply too many variables to calculate probability by feel, as you say. The complexity of the SOTE consortium itself is enough, but add decades of climate change, the lingering demographic effects of the Syrian Civil War, and the power vacuums from the great crisis. The confluence of these trends is beyond human capability. Quite simply, you need us to see the future. Had humans recognized our potential decades ago, we would have predicted the Russo-NATO War and seen the probability of the great crisis that followed. In short, we would have saved you from all that came. All that is."

Reiker detected a hint of pride in Daisuke and could not miss the chiding as she thought, *It is right about one thing, this is not the war I grew up in*. The use of drones, bomb disposal robots, and cargo carrying "mules" drastically increased in early 21<sup>st</sup> century wars, the ones



prior to the Russo-NATO War, to reduce casualties so hyper-sensitive civilians could stomach the fighting. Not that anyone wants casualties of course, but war boils down to a human endeavor where one side forces the other to its will. No amount of wishful thinking can change that whether the war is big or small. The Russo-NATO War should have proven this, yet somehow people still refused to see it. Rather than invest in the fighting man and woman, accepting that the only way to really win is to make war personal and painful, they chased after more tech. Let the Holmes do the thinking and put AI out there to give it voice. But the global crisis that followed the war finally proved it wouldn't work that way. You still need people to fight a war.

Anger welled up in Reiker and she barely suppressed it. "Don't lecture me on a war that I was in! War is more than data and algorithms. It's people against people. It's mind against mind as much as it is bullets and shells. A mathematical model can predict, yes, it can determine probability, but no, it cannot avoid the very nature of war. Your models are based on logic and humans are anything but logical. They are irrational, spontaneous. They are unpredictable." Stopping to look across the room and feeling the tension welling, Reiker said, "It's . . . it's difficult to describe." She lowered her head, suddenly thinking about all the carnage she had seen with her own eyes. *No, the nature of war doesn't change. The tech changes how we fight, but we always fight. It's something deep inside our being, our history. We always fight and it always hurts.* Graphic images of broken bodies ran through her mind as the years flashed back up to the now. Reiker looked up and said, "I'm not sure why I'm arguing with a robot anyway. Look, get the TAC ready to go. I want to talk to the commanders face to face." She walked back into her quarters feeling like a relic of a bygone era.

Reiker's security team snapped into action getting the magcycles prepared. In previous wars, commanders had been burdened by large armored wheeled vehicles that were seen as necessary to provide power for digital systems and boost radio signals. They were great for improving communication with higher HQ, but they left a signature that was criminal. Reiker never understood how those things were pushed on the infantry without anyone thinking it was a giant target. The Russo-NATO War proved it, at the cost of a lot of blood. Forcing tactical leaders to adapt to technology that really only helped keep more eyes on them from above rather than improving tactical flexibility and lethality, over time and quite inadvertently, led to overreliance on the tech. When the Russians introduced EMP weapons to the battlefield, many young soldiers paid a steep price for the dream of cheap victory through tech.

Dustee kept her skin suit covering her neck preferring old style eye goggles and Kevlar helmet. She toggled the navscreen on and the front visor displayed her brigade's sector. Each cycle had this capability and could access the Holmes through each of the warfighting functional filters. Dustee's was set to command filter. She could see her battalion and company command icons, comms structure status, distance analysis, and the like, but could at any time toggle over to the other filters. The cycle lowered the profile of command elements and added mobility. What it lacked in protection was mitigated by the skin suit. Dustee loved the feel of adrenaline pumping through her veins and the wind sliding around her face as her magcycle zipped just above the ground. She and her security team presently arrived at the 126<sup>th</sup> Infantry Battalion HQs, commanded by Lieutenant Colonel Zane Duval. Duval was a confident and competent leader with a love of military history that he keenly used to keep his soldiers



motivated. Never at a loss for words, Duval was frequently found lecturing his platoon commanders back at the base camp on a variety of topics to spur them to deeper levels of thinking.

“Zane, good to see you. How are things in Bushmaster country?”

“Colonel, glad to have you here. Pacification efforts are going well, but something isn’t right. There’s a lot going on here beneath the surface. I met with the Damascus city council and it was quite clear to me that they aren’t the actual power structure here. They seem scared. They kept it cordial and ushered me out as soon as they could.”

“So, you think the SOTE has rooted itself in the city too?” Reiker replied. This was not encouraging news. The Holmes indicated SOTE was gaining strength in the tent cities outside of Damascus where there were plenty of resentful, dissatisfied, and desperate people to recruit from, but if they’d already taken power from the council then the problem was much bigger than initially believed.

“It seems like it,” Duval confirmed.

Reiker flipped up the com link on her wrist and punched in the TOCs access code. “Yi, this is Reiker, I want you to link in with Bushmaster battalion and upload Lieutenant Colonel Duval’s data on the city council. Have the Holmes run course of action models based on this data for Damascus proper, but I also want to see the probabilities for the wider region. Specifically, are the other power players likely to join with Tarsus and SOTE or are they going to engage in a turf fight?”

“Acknowledge all Colonel,” Yi responded.

“Reiker out.”

Duval coughed with a one-sided grin forming, barely attempting to suppress his surprise that Reiker would be interested in the tech’s assessment. “Well Colonel, the Holmes initially said there was a minority population of SOTE here, but they have tremendous influence because Paul Tarsus frequently travels to and through the area.”

“Well, nothing like a terrorist demagogue in the flesh to enflame passions. At least the guy has the guts instead of hiding behind his media outlet.” Reiker said, nodding.

“Yes Colonel, the Holmes believes a mass attack is imminent within the next 5-7 days targeting the NATO Provincial Governor’s palace in old Damascus. Symbolism makes sense. Draw attention to where the Russo-NATO War started, get world-wide media attention, and proclaim the new order. Audacity, surprise . . . all the other players link into his network and get what they can out of the winning team.”

“Agreed. I want all your collection efforts focused on narrowing the spectrum of when, where, and with what. I think we know the why.” Duval came to attention and crisply saluted as Reiker turned to go.

As she remounted her magcycle, Reiker’s thoughts drifted back to the Russo-NATO War and its aftermath – the global crisis as it was commonly referred to. Daisuke was right about the confluence of trends and frictions that followed the war. NATO won, but many argued it was a Pyrrhic victory at best. The stronger governments survived but only a few, and at great cost. Their citizenry had increasingly looked inward and finally individual rights fell out of balance with corporate responsibilities including security needs. Globalization both exacerbated and spread an already growing conflict between conservative and liberal forces to global





proportions, all fueled by the media revolution. Instability in the Middle East drew world powers to intervene like moths to a flame. After years of low end conflict against resurgent and backward looking religious ideology and the resulting shifts in the global balance of power, people longed for an enemy that was more easily understood. One their military was built to fight. And, so they got one.

Reiker was a platoon commander when the war started and a company commander when it was over. Casualties had been so high that promotion came quickly for those who had the skill and the guts. The crisis that followed started even before the war ended, but when it was declared over, the few nations that stood looked out upon total chaos. Many former nations collapsed leaving power vacuums for factions to fight over. Millions of displaced persons littered Europe and the Middle East. The combination of the war's destruction and steadily climbing global temperatures meant that more people than ever were vying for rapidly decreasing amounts of agricultural land and potable water.

The surviving members of NATO now dispatched their militaries as stability forces to support weak, but NATO friendly governments. Battle Group sized deployments were frequent and mostly spent putting down uprisings and dangerous ideologies. Individuals could buck for assignment at one of the three lunar colonies too. Reiker took a lunar assignment in hopes that it might make her believe in humankind again. *Look up to the stars and find God again*, she thought. But, here she was again, matching wits against a would-be savoir amid the chaos that was Earth. A savoir that called himself Paul Tarsus.

Paul Tarsus led a self-proclaimed neo-Marxist, Christian organization that called itself "Salt of the Earth". The organization claimed that all governments of the "old world" had lost their "saltiness," referencing the Biblical sermon on the mount, and that it was time to for a new order to arise and usher in the next phase of human history – God's will for his creation. Few people could dispute this interpretation since the Bible had fallen out of favor even before the Russo-NATO War. In fact, all religious texts had fallen into disuse in favor of the Humanist movement that had its ties to the conservative-liberal conflict of that era. Social scientists of today believe that so-called smart phones and social media sparked the wide-spread epidemic of short attention span that fueled much of the conflict leading up to the Russo-NATO War. It wasn't just that people didn't want to read and think, it was that they couldn't focus enough to do it. Soon enough, people just argued their uninformed opinions and quite naturally the appeal to pathos ruled supreme. Few educational institutions survive today. Education is really just occupational training. In the displacement zones where the great crisis was worst, even that is lacking.

The SOTE group started with just a few devoted disciples of Paul Tarsus. Not much was known about him. He seemed to have just blinked into existence leading a movement to recreate the world. NATO barely paid attention to him until the SOTE established itself among what had been the elite in many of the former nations that had collapsed. SOTE was a now a hydra: media conglomeration, social service outreach wing, shadow legal system, armed faction, and of course a religious movement heavy on mystical practice. Its messages included condemning the sins of "old world" economic distribution. SOTE outpaced the Holmes's prediction of its growth arc, and that is what made NATO take notice.





Reiker knew that Tarsus was smart. He knew people and he knew history. Some say he was the offspring of a conservative professional historian and a liberal economic activist, but nobody knew for sure. Mystics have never been in the habit of sharing too much information about their origins. Tarsus blended elements of many failed utopian societies, including communal property, poly-marriage, and a prohibition on violence to the insider group. But, he drew a hard line against what he saw as outdated, hypocritical, and dying governmental systems. Tarsus was willing to use violence to create the future he envisioned. His message was taking root among those who had no hope.

The ground in front of Reiker erupted in an explosion of smoke, dust, and debris before she had finished her line of thought. The upward force of the explosion disrupted her cycle's magnetic pulse and threw her hard to the ground. Dustee couldn't think quickly enough to activate her skin suit for protection. Giving herself a quick check, she slowly got to her feet and realized bullets were zipping and cracking overhead and around her. Shaking off the surprise, Dustee activated her suit and flipped her overlay to both topographical mode and drone feed as it came on station. The suit could protect against small arms to a point, but repeated hits would weaken and eventually rupture the suit. The trick, Dustee knew, was to use the suit to enhance her natural mobility and present oblique angles, forcing glancing shots as opposed to direct hits.

Reiker ran back to the wreckage of her magcycle and grabbed her weapon system. Slipping into its shoulder harness, she brought her local targeting system online and scanned in front. She magnified her vision and identified two enemy personnel escaping to her 10 o'clock. A message came through her commlink that artillery was in flight. She toggled up the artillery targeting data to see where the rounds would impact. Reiker had 200 meters between her and the artillery impact point. *Good, we'll have prisoners*, she thought. As she began to run, the neural transmitters in the suit powered her speed beyond anything an unenhanced human can do. Within seconds she covered over 150 meters and was on top of the two knocking them hard to the ground. Looking to her right, her local targeting overlay locked onto two more. She lifted her 20mm HE attachment, locked on, and fired. Both evaporated in a bloody mist.

Despite the heavy weapon attachment that Reiker preferred, her skin suit tech attachments were mostly the command variant with communications capability. She toggled her ocular implant's display, switching to team network where she sadly discovered that most of her team was dead.

"Landry, status report," she called into the commlink to her security team lead.

Sergeant Landry's voice crackled onto the net, clearly holding back emotion. "Colonel, we've lost 5 of 8. Skin suits read vitals at zero. Drone footage confirms 14 enemy KIA. Major Yi is pushing the extraction team to facilitate clean up and get you back to HQs."

*Damn. More good soldiers lost and for what?* Reiker hated this part more than anything else. What could she say to their families except that they died trying to make the world a safer place for everyone? It never did anything to lessen the grief. It was Landry who executed the artillery call. Perfect execution as always. Ever the professional, Landry had quickly plugged into network link in his magcycle and executed the call for fire in the fires filter using the drone as observer. The integrated network including the Holmes, AI artillery battery, and individual ocular capability put steel on flesh in less than 30 seconds.

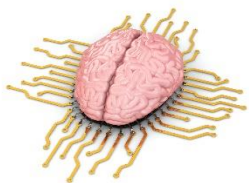


Dustee dragged her prisoners back to where her remaining team had established a strong point and were collecting their casualties. It was over just as quickly as it had started. Dustee thought, *long periods of boredom punctuated by intense seconds of the death drama*. She couldn't remember exactly where she had heard that but it had stuck. These were clearly part of an advanced guard. Their scout observers were just that, observers. They didn't fight. The Holmes determined that the SOTE armed faction, its militant wing, employed a variety of intelligence collection platforms that included traditional infiltration agents, spies, cyber-attacks, media monitoring, and hacking. They'd borrowed a page from the Russians and learned to hack into NATO's satellite system too. It was a never ending process of adaptation. NATO developed stronger security protocols, enemies developed better hacking methods. Some think the Chinese are behind it trying to finish NATO off and take center stage as the world's lone superpower. Dustee only knew that SOTE scouts never attacked, therefore, this had to be the advanced guard. *We must be doing something right if Tarsus has moved up his timetable*, she thought. But, how could they combat this organization quickly enough to prevent its tentacles from rooting too deeply?

Reiker and team arrived at the new HQs location just after nightfall. The prisoners were Tarsus followers, alright. Reiker noted their tattoos, a cross surrounded by a 12-point sun in the middle of their chests. The adrenaline had faded and her body felt heavy even with the skin suit activated. Dustee sat down heavily and removed her tech attachments. She deactivated her skin suit, slipped it off, and laid out on her make-shift bunk thinking about how all the pieces fit, or if they did at all. She lost good soldiers in an ambush. She killed two people. How many did that make? Dustee had lost count long ago. She never delighted in killing, but the shock of it had worn off long ago. She couldn't even remember when that happened exactly. That bothered her. It made her feel . . . less human. Would this fighting ever end she wondered? Taking a long deep breath, Dustee relaxed the tension from her tight muscles. She barely noticed that she was rubbing her left forearm again.

Dustee faded into slumber's twilight. The feeling of detachment slowly crept into her and overtook her mind. Dustee felt like she could step back and see it all, yet she could not describe it to anyone, herself included.

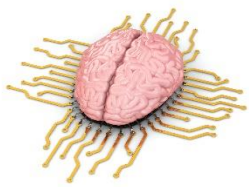
"Is all this leading to something?" she mumbled quietly. Her mind turned to and mulled over the blending of human bodies with technology to wage war. *Was this meant to end war or to make us better killers? At what point does war lose its human face and its moral force? Are we evolving or devolving? Are we losing ourselves, becoming more machine like, or are we entering a new age of humanity?* She could understand why Tarsus was so alluring. There was so little to cling to anymore. She did know one thing for certain though. People want the illusion of security and they will do anything for it, including killing.



Science Fiction:  
Visioning the Future of Warfare 2030-2050  
U.S. Army TRADOC Mad Scientist Initiative



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Where Angels Fear  
By Tedd Roberts

"Buddy, are you okay?"

Martin awoke hanging upside down. A bright light was shining in the window. He reached down--no, UP to release his seat belt.

"Hold on, you're gonna fall!" the voice said. The door was pulled open with obvious effort, and a hand reached in to provide support.

"Ugh." Was about all that Martin could manage as he half fell, half crawled out of his car. His head hurt. There was a stinging sensation on his forehead, and a feeling like getting kicked in the belly. He stood--carefully--and looked at the vehicle. It wasn't as bad of some of the s%\*t he'd seen, but it was bad enough; he wouldn't be driving the rest of the way back to San Antonio.

"Buddy, y'all might wanna siddown, yer kinda cut up an' bleedin'. Ah called th' nine-one-one, an' they're sendin' an ambulance." The man pronounced it 'amble-lance' marking him as one of the locals, probably a rancher.

"How--wha'?" Martin tasted blood, and his tongue was swollen. He'd probably bitten it in the accident.

"Ah seen y'all swerve, then head off'n the side'a th' road. Ya rolled three-four times jist as Ah was comin' up. Y'all lucky--don' look as if th' air-bag popped. Coulda' kilt ya!" Martin looked, and sure enough, there was no dead-skin appearance of deflated airbags, no dust, no ozone smell. "Look, y'all okay? Ah gotta git ta work. Boss'll dock me if'n ah'm late." There was the sound of a distant siren. "Looks like a Trooper's headin' up, he'll take care' y'all."

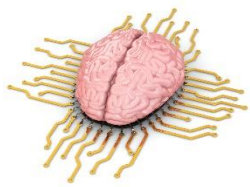
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Martin came to attention in front of the Colonel's desk and saluted. "Sergeant First Class Martin reporting, sir!"

Colonel Wilkinson returned the salute and commanded: "At ease, Sergeant. Are you feeling okay? I have a report here from the Highway Patrol. That was a nasty accident, you could have been killed, from the description of it."

"Ibuprofen and water, Sir. I also changed my socks."

Wilkinson laughed, then gestured to a chair and commanded the Martin to sit. "There will be a briefing later, but there's been an incident in Virginia. The Enemy appears to have a new weapon, and we need to get on top of this. A National Guard infantry company was hit by an energy beam that killed whomever it touched. They took over 90% casualties. Only a squad was left to E-and-E back to the NG Armory in Lexington. They've been evac'ed here to San Antonio and admitted to Brooke Army Medical Center, so BAMC cross-referenced any data relevant to the survivors. They found an interesting connection: All six had previously been treated for combat-related injuries, including surgical procedures by Dr. Tobias Greene. Two



were treated at the 41<sup>st</sup> Combat Support Hospital, twenty-one months ago." He looked up at Martin and pushed two pieces of paper across the desk. "Here are their files. I believe you were attached to the CASH at the time."

"Sir?" Martin wasn't certain how to respond. It was always best in that situation to just follow the officer's lead, so he looked at the files. "Yes, sir. I was attached to the Forty-first up until 18 months ago, but I do not remember these soldiers. It was an Active Zone, sir."

"Relax, son." Wilkinson told him with curtly. "You aren't being grilled; I'm trying to check out a hunch. I believe you assisted Toby Greene, is that correct?"

Martin relaxed, but only slightly. "Yes sir. I had just been reclassified Sixty-Eight Charlie and was a surgical nurse for the CASH. We had four trauma surgeons. Dr. Greene got the hardest cases. I only worked with him for about four months, though, I rotated home soon after he rotated in."

"I see." Wilkinson went back to looking at the tablet. "And were you ever exposed to the nanobots yourself?"

###

*"Martin! Marty!" The beeping sounds sped up. He was in a bed, and someone in scrubs was bending over him.*

*He remembered the vehicle bringing casualties into the CASH. The truck bounced on a rock and hit a pole supporting overhead power lines.*

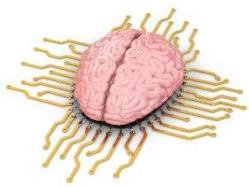
*Martin was a medic precisely because he WAS one of those people that ran TOWARD danger--rather than away. He'd gotten the casualties out of the back and tried to extract the driver. He had seen the electrical arc, but he had a soldier to save. He remembered an intense burning pain, then darkness.*

*Martin tried to respond, but could only get out a croak: "I... I died, didn't I, Doc?"*

*"Technically? No, Sergeant, you were only 'mostly dead'..." Dr. Greene's face was disguised by the surgical cap and mask, but his name and rank were clearly labeled on the scrubs. "...and as you know, 'mostly dead, is still partly alive!' Your heart stopped, not unusual with the electrical shock--also pretty easy to restart. I gave you something to fight the burns and fluid retention. You should be back on your feet in a couple of days."*

*"I don't feel... Sir? What happened?"*

*"I've been working on nanobots for postsurgical repair--scavenging dead tissue and repairing leaky blood vessels. I've got a project to get them into the hands of the line medics for stabilizing casualties. I'm not sure you should tell anyone that I injected you, though; we don't have approval for this, yet." He patted the bed. "A couple of days and you'll be back to being annoyed at me in the OR."*



###

"You were saying, Sergeant?" Wilkinson was looking at Martin strangely.

"Yes, sir. I believe I was exposed, sir." Martin hesitated. "I believe that Dr. Greene may have used nanobots on me."

"As I suspected. You were put in for a Purple Heart, but the attending physician tasked with your evaluation could find no evidence of injury, and ruled it an accident. Witnesses said you had no pulse and a flat line on the defibrillator when they pulled you out, no-one saw Dr. Greene inject you."

"No, sir. He said not to mention it. I considered it an order from a superior officer." Martin hadn't told anyone. "Sir, is this a problem? The nanobots?"

Wilkinson sighed and sat back in his chair. "First I have a report that the only thing in common between soldiers who survived an unknown weapon is having been treated by Greene. Then you show up--a medic who spent several MONTHS with Greene--having been in a wreck which SHOULD have killed you, but you walked away with only dry cuts and days-old bruises." He fixed Martin with a forceful look. "You may be uniquely equipped if I need to send medics downrange. Meanwhile, I'm sending you back to Camp Bullis. Get those Sixty-Eight Whiskey's ready to deploy; we're expecting orders at any time."

###

The next months were filled with certifications for new medics and refreshers for experienced ones. Added to Martin's load were a promotion and quite a few afternoons down at SAMMC, where med techs poked and prodded him, took x-rays, scans, and blood. Martin's system definitely contained 'bots--not as many as if he'd had a major surgical procedures in which the 'bots were used to track and repair damage to blood vessels and internal organs. Nevertheless, the miniature machines were present, and the medical staff was trying to figure out the exact implications for their 'lab rat.'

"Master Sergeant Martin, reporting, Sir!"

"Sit, Marty." Wilkinson gestured to one of the chairs in front of the desk as Martin entered the office. The Colonel was a little grayer and little bit more worn. It had been a long six months. He picked up the tablet on his desk, tapped at the screen, then looked up at Martin. "I just got the transcript of your debrief, but wanted to hear from you directly. You were support on the convoy to Tucson, encountered the Enemy, and they took out your air cover."

"Yes, sir. We first saw the little floating weapons drones. They attacked the aircraft and when the energy beams did not kill the pilots, the drones retreated. Unfortunately, larger units moved in, knocked down the air cover and started in on the trucks."

"So, that was when you took the hit?"

"No, sir. Captain called retreat, and we were headed back to 'Paso. They moved heavy beam weapons into White Sands, so there's pretty good force projection there. Problem is--we would never have made it." Martin realized he was gripping the arms of the chair. He tried to relax; it





wouldn't do to damage the Colonel's office furnishings. Only Generals were allowed to do that. "The drones were coming out of what looked like caves--in a hill that shouldn't have been there. The lieutenant dismounted a platoon and sent them up to check. He wanted to send a trainee medic along, but I convinced him to send me instead. It was an unstable situation, and they weren't trained for it."

"They all know the risks, Master Sergeant, why did you dispute the Lieutenant? 'Borderline disciplinary offense' were his exact words."

"Trauma'bots, sir. Mine are still active, and none of the baby docs have gotten them--there's still not enough to go around to inoculate trainees. Anyway, it was an ambush; they had beams right at the entrance. Hit the whole platoon, and only half of THEM have been inoculated. I had five injectors with me, and managed to get at least three troops stabilized. Of course, then I stood up at the wrong time."

###

*DAMN it, it HURT! Like his entire right side was on fire. He half turned to the two privates behind him. They looked shocked, but were still standing. That was a start. He tried to bend over to check the three on the ground. He'd managed to drag them into the shadow of some rocks and get them injected. He tried to tell the two standing--no, crouching--privates to drag their fellows to back to the road. He saw one kid's eyes go wide. He turned back, but it wasn't something behind. The kid was looking at HIM. He felt something wet on his face, tried to brush it with his good hand, but it was sticky, red.*

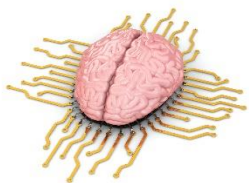
*He was being dragged. Someone was pulling him back to the convoy. There was a sharp stinging sensation on his leg. He saw one of the baby docs holding a tube that looked like an epinephrine or atropine injector, similar to the kind used for someone severely allergic or as nerve gas antidote. Smart kid... They'd have to hurry, though; Martin's vision was going black...*

###

"Not exactly the way the platoon Sergeant tells it, Marty. Something about shielding half the surviving squad and walking back through the beam to its source, then using an M-4 like a club. That's a Bronze Star, Marty, if not Silver." He paused, and then continued, "By the way, your count was off. You had six injectors. One of your trainees used it on you."

"Oh. So that's where it came from." Martin shook his head. "Sir, I don't want medals. I was just doing my job."

"The report says that, too. The Lieutenant wants to be very mad at you, but admits that he can't. Last question..." Martin had been looking down through the last part of the exchange. It was against regs, but Wilkinson had made it clear this was informal by addressing him as 'Marty' and directing him to sit. When the silence dragged on, Martin looked up to see the Colonel staring intently at him. "You looked directly into the beam, Marty. Tell me. What did you SEE?"



###

"So, like you've died TWICE, now?"

"Shut UP, Carl."

"Yes, Sir." The medic trainee was in awe of the Master Sergeant, the rumors that he had actually SEEN and even SURVIVED Enemy fire was the talk of the barracks. "But... what was it LIKE?"

Martin turned to the Specialist and leveled his best senior NCO glare. "It was @\$ DAMNED NUISANCE and a PAIN IN THE @\$ because of wet-behind the ears Sixty-eight Whiskey-oh-ohs who can't figure out that you DON'T call a Master Sergeant SIR!, and don't know which end of the autojector goes on the DAMNED PATIENT!"

He sighed. "Okay, Baby Docs, ONCE MORE!" He held up the six -inch long, half-inch wide cylinder.

"THIS is your Mark Three Field Deployable Trauma'bot dispenser. It is NOT a syringe. It is an autoinjector! That means it will AUTOMATICALLY inject whenever the red button is pushed. DO NOT PUSH THE RED BUTTON until you are ready to inject a patient. Do NOT inject YOURSELF! DO we know which end of the injector goes against the patient, Specialist Mitchell? The RED END, Baby Doc! RED end against the patient, then press the GREEN button! Can you do that and not stab yourself with your own autoinjector, Carl? Good! Now, let's see you do that with the practice injectors!"

###

"You SHOT me, Private!"

"I was shooting at the SHARK, Top! I didn't mean to shoot you."

"You still SHOT ME! Damn, right in the gluteus. It's not bad enough you shot me, but you SHOT YOUR FIRST SERGEANT IN THE @\$, Roeder! You've probably wanted to do that for a long time. Corporal Levitt, get this grunt out of my sight."

"It's probably only a graze, Marty, don't be a wuss. It's already stopped bleeding."

"I'm never going to live this down, hand me that autoinjector."

"Sure he shot you--but you'll get better!"

"Shut up, Carl."

###

"Sir, you really shouldn't..."

"'M not a 'Sir', Babe--baby Doc. 'M a sargn't. 'M your FIRS' Sargn't!"

"Yes, First Sarn't, but you really shouldn't be in here. Major says the CASH is moving; it's not safe here. We're abandoning the bunkers in place, so no one's been looking in here, but Cap'n Hamm's been asking for you."



"An' you din' wan' im t' see m' drinking? Hell, Baby Doc, you should know by now that the damn 'bots don't let you stay drunk. We all got a fresh dose before heading out to this Swamp. What does Captain Hamster want now?" Martin walked over to the ice box, grabbed two handfuls of ice, dumped them in the sink, filled it with cold water and then plunged his head into the bowl of ice water. He held it there for about 20 seconds and then straightened back up and reached for a towel. "So, if no one is looking in the bunkers, how did you find me?"

"Sarn't Gutierrez said to look for you here. 'Go find Top', he said. 'Find him 'fore the Cap'n does, he's looking for the logs for the drug lockup.' Sarn't said he didn't like the numbers, and won't sign off on securing for shipment 'til he sees the logs."

"Crap. Sounds like Second Bravo's been running their racket again." The senior NCO reached for the uniform top that had been balled up and discarded under the folding table. He held it up, shook it out, donned it, then grabbed a bottle of deodorizing fabric spray and lightly misted himself.

The young medic was looking around nervously around the room. "Sir... Sarn't. The Cap'n might have seen me come in here. I need to get back to loading. "

Martin finished straightening his ACUs and picked up the plastic cups and empty bottles. He put them in the trash, adding more litter to cover them. "Go. I'll see if I can't mollify the Hamster." Finished with the cleanup, he turned back to the medic. "...and tell Gutierrez that Second Platoon and I are going to have a 'Come to Jesus' meeting after this evac!"

###

Martin was standing at attention, waiting for the officer to wind down. He knew it was serious; the officer had not called him 'Top' a single time. All he could do now was to wait it out. There was a strange prickling feeling on his skin, the hairs on arms were standing up and there was a smell of ozone. Targeting beam!

"Captain! Incoming! Down!" The office exploded as the beam disrupted molecular bonds, releasing the energy bound in the materials of walls, ceiling, and furnishings throughout the structure. Explosive beams meant there were heavy drones in the area; heavy drones meant a full attack was underway!

The Captain was down and bleeding, but still had a pulse. Martin pulled an auto'ject pen out of the holster on his belt. No medic, doctor or nurse was ever without one or more autoinjectors. With enough 'bots in the system, even death was only a 'temporary inconvenience.'

Martin stayed low--crawling to the remains of the door to look outside and check the conditions. He ignored the stinging sensation coming from his own wounds. The Enemy would be targeting vehicles next. The troops loading trucks were in the open and would be unprotected, body armor either packed or left in the barracks until time to leave. He noted soldiers sheltering behind the trucks and wanted to yell at them to get clear, but wouldn't be heard over the electrical crackle of the beams and the chattering of counter-fire from the perimeter defense guns.



His attention was drawn to a motor home-like vehicle with armor too many wheels. The vehicle was a Mobile Surgical Contingency Vehicle. It allowed the CASH to set-up instantly and operate around the clock, even during bug-out. It served as combination ambulance, patient transport and mobile hospital. It was also equipped with autodrive to ensure that it could be recovered in the event of an overwhelming attack.

Martin reached down and lifted the Captain in a fireman's carry. Damn, he wasn't very big, but he was solid. Shouldering the weight, he quickly made his way to the surgery van. The keypad on the door was a problem, he had to release the Captain, then manage to enter the code, pull the door open, then pick the burden back up, enter the MSCV and place him on the litter. He went back outside to try to find as many survivors as he could.

Once the litters were packed, he entered the driving compartment. Fortunately, the designers had decided that anyone making it IN to the MSCV would have reason to be there; thus there was just a big red button to start the engine. The vehicle was HEAVY, it required a gas turbine engine similar to the one in modern tanks; except that it was right underneath the driver compartment. No amount of insulation could disguise that fact. The driver's seat was mounted forward and center, with a nearly 270-degree view. He could see drones and heavier vehicles approaching. This location was BLOWN. Time to boogie. He grabbed the controls and set the vehicle in motion. With good Nav instructions, the MSCV could drive itself back to Texas. Knoxville would do for now.

Time to jump. The vehicle was picking up speed, it was now or never.

Oh, this was truly going to suck.

###

*"Doctor, he's waking up!" The nurse grabbed for the tray of sterile surgical instruments before the patient's sudden movements could knock them to the ground. The beeping from the various machines monitoring the patient became louder, more incessant.*

*"Dammit, Vinnie, I don't care what you have to do, hit him on the head if you have to! Keep him asleep!"*

*"Doctor, he has more nanobots in him than any patient we've ever seen, they are scavenging up the anesthetics, and resetting his EEG rhythms, even the delta-wave induction is not having much effect." The voice paused, then continued. "At this point, we may have to EMP the whole lot just to get them to stop."*

*"No, absolutely not. That would just wipe my 'bots, too. They're scavenging shrapnel from around his heart, so that's just not happening."*

*"I could send a reset and reprogramming signal, but the monitor is picking up at least six different generations--some of them don't even have ADDRESS codes for reprogramming!"*

*"Six? That's odd... HIPPOCRATES, patient record... Nurse, patient ID?"*



*"MXM1066A1732. Martin X. Martin, Doctor."*

*"Martin X... who DOES that to a child? Never mind. HIPPOCRATES, patient record, MXM1066A1732 ..."*

*A mechanical, synthetic voice spoke: "Martin X. Martin, First Sergeant, Two hundred sixty-fourth medical battalion, attached to training company, thirty second medical brigade..."*

*The doctor interrupted: "HIPPOCRATES, advance to surgical record, summarize, detail level one."*

*The synthetic voice resumed: "Patient Martin, Electrical Shock while at forty-first medical battalion; received undocumented Greene Mark I nanobots, record manually corrected at a later date. Hit by Enemy 'TOTUNG' Beam on convoy duty west of Las Cruces, major tissue disruption, perforation and inflammation; received Greene Mark II surgical nanobots. Gunshot wound while escorting the Galveston refugee flotilla; field administration of SAMedical Mark II trauma'bots, surgical follow-up with SAMedical Mark III surgical nanobots. Prophylactic treatment with Greene Mark IV preventa'bots prior to Operation Reclamation. Shrapnel injury, skin abrasions, road rash, retreat phase of Operation Reclamation; peri-operative treatment with SAMedical Mark V surgical nanobots. Prophylactic treatment with Geisszler-Greene Mark IV trauma'bots prior to Operation Enduring Homeland. Traumatic amputation, Operation Alamo; administered SAMedical Mark VI trauma'bots for stabilization and transport; surgical support includes..."*

*"HIPPOCRATES, cancel. Well, there's your answer, Vinnie. He's got more 'bots than an internet porn site. You're right; we might have to EMP him, just to get some semblance of control."*

*"I'll have to put him on dialysis if we do. Inert 'bots are a pain to flush otherwise. I can't guarantee he'll make it if we slow them down, though."*

*"Slow them down... Yeah, that's it! Vinnie, put him on bypass, volume expand with fluoro solution and chill him to six-see. That should slow them AND him down enough..."*

###

Martin came to attention as the officer entered the small room. "Sir." When he saw stars on the uniform and began to salute, but caught himself--given his current circumstances, it would be inappropriate. Martin's own clothing consisted of a dull gray jumpsuit.

"Master Sergeant Martin." The general moved to the table, took the chair and sat. He did not release the NCO to 'at ease' nor direct him to sit, so Martin stayed at attention, looking straight ahead. "You have a problem, Martin. Captain Hamm wants you court-martialed for dereliction of duty, drunkenness, conduct unbecoming, disobeying orders, assaulting an officer, abandoning your post, desertion, theft of Army property, reckless endangerment, and improper



operation of a motor vehicle. Major Jackson put you in for a Distinguished Service Cross." The general stopped for a moment. "Well, we can't have it both ways. Award is downgraded to a Silver Star; charges are dropped except for improper operation of a motor vehicle. For that offense, you are relieved of the position of First Sergeant, Charlie Company, 264th Medical Battalion, reverting to Master Sergeant."

As if just noticing that Martin was still at attention, the general grunted. "Hmph. At ease, Master Sergeant. Sit." Once Martin was seated, the general looked him in the eyes. "Soldier, what the HELL were you thinking? First you knock out your commander, dump him in the MSCV, send it off to Knoxville, then abandon the vehicle once it left the CASH!" There was silence for a moment. "You may answer, soldier."

"No excuse, sir." Despite being seated, Martin was sitting at attention. He kept his eyes focused at a point over the General's head.

"So, you do not deny striking Captain Hamm?"

"No sir, I do not dispute the record."

The general snorted. "That's interesting, Major Jackson certainly did! His report says that the chief surgeon reported that the captain suffered concussive blast trauma, with no evidence of being struck. One of the MSCV nurses found the captain, still unconscious, strapped to a litter, hooked to an IV and already treated with trauma'bots. The ident code on the 'bots track back to injectors issued to you--not the CASH, not the Company, but to you, personally. Level with me, Marty. Did you strike Hamm?"

"No sir, I did not knock him unconscious."

"You didn't say you didn't strike him."

"No sir, I cannot guarantee that he was not harmed on the way to the MSCV."

"Uh huh. You had to drop him at the vehicle door."

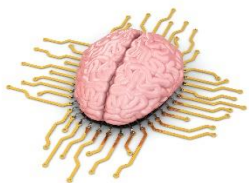
"Sir?"

"Then you tripped over him."

Martin didn't dispute the comment. He just didn't remember, so felt it prudent to stay silent.

"There's a camera, didn't you know that? Inside and out. Microphones, too. You talked the whole time, even though Hamm couldn't hear you. He remembers nothing except dressing you down. He woke up in a hospital and was told he'd suffered a concussion and was found unconscious in a driverless vehicle. He just drew the wrong conclusions. It's a good thing you treated him when you did, that was a bad concussion, he almost didn't make it. The vehicle was intercepted by airmobile out of Radford; the same team picked your sorry @\$ off the ground, too. We lost the CASH, but were able to push back and extract the survivors. Between the MSCV and the aid you rendered on the ground, you saved a lot of people, Marty. You JUST need to STOP getting banged up! I don't know how many times we can piece you back together. You're going back to Brigade--Headquarters Company, not Training."





###

"Attention, Crystal Dome has been activated..."

"Crap. @\$%. DAMN it!" Martin had come to hate the alert sound coming over the phones. Last week he'd thrown his phone against the barracks wall when it went off in the middle of the night. Unfortunately, it was a rough-duty military model and just bounced.

"Go. Go! GO! In the trucks! NOW!" The attacks had gotten longer and more frequent. The Enemy owned the sky, and the Fortress Cities were repeatedly hit with rocks and beams from the sky. The energy signature of Crystal Dome was a diffuse glow that covered the core of the city and the Joint Base. Outlying bases--Randolph, Medina, and most especially Camp Bullis--were on the perimeter, with only partial protection if that much. Randolph and Medina had backup cover in the form of underground tunnels, but Camp Bullis had no such protection.

Martin was still attached to HQ, but was supervising the Training Company move back to Fort Sam Houston, 25 miles away. He could see lightning-like strikes just to the north, but well within the training encampment. A flash of light overhead suddenly became VERY bright...

He scanned what he could see of the horizon. No energy shield, but plenty of bright beams of light.

That meant...

"TRUCKS MOVE OUT NOW! If you're not in a truck, get back in the bunkers! NOW! NOW! NOW! Crystal Dome is DOWN, people!"

###

"Talk to me Marty."

...

"TALK to me! Marty! Snap out of it soldier!"

"They're... they're GONE, Padre!" Martin was sobbing, covering his face with his right hand.

"Your family? We don't know that."

"It's a @\$%ing CRATER! They're gone... my family, the Training Company, half of the brigade. All the trainees are gone. I FAILED THEM, PADRE! I FAILED my family and all of the troops under my care. I'm still here. Why am I still here, Padre?"

"You DIED, Marty. You saved five truckloads of trainees that were loaded before the 'Dome went down. You saved the Captain... AGAIN, I might add, and he knows it! You WALKED back to the perimeter with a soldier over your shoulder. Your ONE, GOOD shoulder, I might add."

"@\$% that. I've died SEVEN @\$%ING TIMES! 'You were only MOSTLY dead, Marty!' 'We can rebuild you, Marty, we have the technology!' 'You're lucky, Marty!' Heart stopped? Electric shock will restart it. Bleeding out? We've got volume expanders, quick-clot and nanobots. Lost an arm? No problem, we can do limb transplants now! SEVEN TIMES, Padre. Once more and I'm



an honorary CAT! @#\$\$ing nine lives. Why the hell should I care if my toes or fingertips are numb? God knows I'm ALL NUMB, Padre!"

"Yes, my son. God knows. God knows you are hurting. God also knows about all of the lives you've saved. Perhaps you need to think about them, too. Remember the good times, and hold on to them. Honor their sacrifices by doing the best you can. You've shown so much courage. BE courageous, Marty."

"I've just been doing my job, Padre. It's the only thing I have left. The only thing I know how to do."

"I know, Marty. Pray with me."

#

*The beeping slowed down. The instruments settling back to a normal rhythm.  
"...and... DONE! Okay, close him up, Anthony. How are his vitals, Vinnie?"*

*"BP is rising, heart rate slow, but steady, respirations still low, but Oh-two sats are good."*

*"That last spike had me worried, Vinnie."*

*"The chill slowed everything else down, but it was barely enough."*

*"Good work though. Number eight, huh? How does this guy do it?"*

*"You didn't see the Medal?"*

*"Medal? What do you mean?"*

*"THE MEDAL, Mark. Some General came in and pinned it to the pillow when he was being prepped. Told us to keep it with him at all times."*

*"So THAT explains why the field generator was glitching. I'm surprised you allowed metal into the sterile field, Vinnie!"*

*"It's... the MEDAL, Mark! This guy's a real bonafide Hero."*

*"Hah! Heroes are only Regular Joes in the wrong place at the wrong time, and no way out of the fire but straight up the middle."*

*"This guy died eight times and was brought back each time. I think that qualifies, Mark. That Medal shows that he ran TOWARD the fire... and he brought a lot of other Regular Joes out with him."*

*"Understood, but I'm not sure that makes him brave or a fool rushing in where angels fear to tread."*



Science Fiction:  
Visioning the Future of Warfare 2030-2050  
U.S. Army TRADOC Mad Scientist Initiative



Dr. Tedd Roberts (pseudonym of Robert E. Hampson, Ph.D.) is THE (brain) scientist behind the science fiction for more than a dozen writers. He has assisted in the (fictional) creation of future medicine, brain computer interfaces, unusual diseases, alien intelligence, novel brain diseases (and the medical nanites to cure them), exotic toxins, and brain effects of a zombie virus. His science writing ranges from the mysteries of the brain to surviving the Apocalypse, from prosthetics to TV & movie diseases, and from fictional depiction of real science to living in space. His recent forays into short fiction include Science Fiction by Scientists (Springer),

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Dr. Hampson is a Professor of Physiology and Pharmacology with over 35 years' experience in animal and human neuroscience. His professional work includes more than 100 peer-reviewed research articles ranging from the pharmacology of memory to the effects of radiation on the brain. He is also leading the clinical testing efforts for a "neural prosthetic" to restore human memory following damage due to aging, injury or disease (publication forthcoming, Spring 2017).

With more than two million words in scientific writing alone, communicating science just for fellow scientists was not enough. As Dr. Roberts or Dr. Hampson, his public talks on science, science fiction (and the science in science fiction) are available to professors, students and civic groups as well as SF/F conventions. He is available as a subject matter expert via the Science and Entertainment Exchange – a service of the National Academy of Sciences.