
A History of the Galactic War
Don Jones

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This version was published on 2018-02-21

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Introduction

Thank you for your interest in this effort. This work is being published on LeanPub.com as serialized fiction, meaning there'll be a new chapter of approximately the same length every 4-6 weeks. If you allowed it, LeanPub will notify you via email when a new installment is available. Feedback is welcomed via LeanPub's "Email the Author" feature, on this book's page there.

A History of the Galactic War is a historical textbook suitable for middle school students. It covers an important period of Human history, spanning roughly 2037 to 2133, including the lead-up and aftermath of what is now known as the Galactic War. The text offers an unparalleled and unprecedented look at this tumultuous period, including research from a panel of respected Human scholars. It offers students not only a treasure trove of information, but also a gripping dramatic narrative. For the convenience of educators, each chapter includes suggested points for discussion, and references to further reading. An additional Teacher's Pack, sold separately, includes classroom quizzes, instructional aids, and supplementary media. First publication, Earth, 2140.

Enjoy.

2037: First Incursion

Life on Earth in 2037 was much different than your life today. Then, the world ran predominantly on *fossil fuels*, which are petrochemical-based liquids, gasses, and solids extracted from below the Earth's surface. These fuels were relatively inefficient, and produced toxic byproducts which built up in the Earth's atmosphere. They were also difficult to extract and prepare for use, expensive to store and transport, and logistically complex to distribute. Fossil fuels were also finite in supply. While the initial supply was quite large, and while Humans had grown adept at extracting as much as possible, the finite nature of these fuels created certain market pressures as well as political pressures.

In 2037, Earth's people were divided into dozens of different independent nations. Each had its own geographic territory, its own form of government, its own rules, and so on. Many had their own distinct languages, although many of these language survive today through cultural preservation efforts. While many of these nations were friendly with each other and cooperated on large-scale projects and affairs, many were hostile to each other. Wars both large and small were not uncommon. Wealth was also distributed unevenly around the world, with some countries possessing significant wealth, physical comforts, and social privileges, and other possessing little of anything at all. Fossil fuels played a central role in many military and political conflicts, as different factions and nations sought to control supplies, pricing, distribution, and so on.

Religious beliefs often served to demarcate different groups of Humans. For some, religious convictions were a private matter. Others sought to drive legislation based on religious beliefs and values, and in some countries the "rule of religion" was the same as the "rule of law." Some religions sought to eliminate believers of other religions, or to impose their religious beliefs on others through law or force.

These preceding facts should help you develop a feeling for life on Earth in the mid-2030s. As had been the case for decades prior, Humans were deeply divided along political, idealogical, and financial lines. Countries made allies and enemies. Many on Earth lived in the midst of total warfare, while others lived in - for the time - relatively palatial and paradisiacal surroundings. Earth was focused almost entirely inward. Its overriding themes were of energy production, conflict, and disagreement.

Technology was simpler than you are used to, of course. Only a single global communications network, *the Internet*, existed, versus the dozens of prioritized networks now in existence. Artificial intelligence did not exist, although Humans had been working toward machine intelligences for decades. Energy production was still primarily from fossil fuels like oil and coal, although Earth had begun switching toward solar power in many regions. Certainly, nothing like today's solar harvesting arrays existed.

What little attention Earth directed outward was minimal indeed. Unmanned drones had been sent to Earth's nearest planetary neighbors - Mars and Venus, of course - to gather scientific data. Little had been done with that knowledge, however, and no manned missions were even seriously considered or prepared for by 2037. Manned missions to the Moon had ceased decades prior, and were never resumed. In 2037, Earth's only manned extra-planetary mission was the creaking old International Space Station, which remained barely functional and was serviced by only two supply runs and crew exchanges per year.

Humanity at the time was almost unanimously convinced that it was the only intelligent life in the galaxy, if not the universe. This, coupled with the sometimes-intense strife on the planet's surface, is what kept Humans' attention focused so tightly upon themselves. The First Incursion, then, came as something of a worldwide shock.

Just as now, Humanity at the time enjoyed fictional theater, including live performances and recorded media. A popular science-fiction theme at the time was first contact, and in many stories, some or all of Earth's governments became aware of alien life,

but hid that knowledge form their populaces on the presumption that an alien presence would trigger social unrest, riots, and other violent responses. If Earth's governments of 2037 had any advance knowledge of the First Incursion, that exclusivity did not last long. Records show that the main ship - called the "mothership" - was first detected mere hours before it achieved close orbit. Later analysis or satellite data would suggest that the ship entered from above the plane of the elliptic, outside of the areas where Earth's few astronomers of the time typically focused their attention. The mothership came to rest in an irregular orbit, above the massive field of satellites, space junk, and other obstructions.

The ship was enormous. Consider the larger buildings of today's mega-cities, like New Atlanta or Chicago Metropolis: any of these massive buildings would have been dwarfed by the ship. Any *ten* such buildings might still seem small next to it. Estimates of the time, while likely inaccurate, suggested a ship over one kilometer in length, and more than two kilometers in circumference. Because visual evidence was scarce at the time, and because little of it survived intact to today, it is impossible to verify these estimates. However, within minutes of achieving orbit, much of the ship's mass split off into eight distinct ships, each breaking away from a common, spine-like mechanism that ended in what must have been an enormous engine array. These eight smaller ships - each still enormous in its own right - proceeded to enter Earth's atmosphere. Each settled into a powered hover over an empty stretch of Earth's oceans, and proceeded to somehow vacuum seawater into itself.

More visual evidence exists of these eight smaller ships, taken primarily from military aircraft imaging systems. The ships' exteriors were a flat, dark gray, with few visible seams or joints. They were shaped something like a cylinder, with a concave section down the side that faced away from the ocean. This concave section would seem to fit against the "spine" of the mothership. The ends were flat and featureless, showing no obvious engines or means of propulsion. They were not recorded to have emitted any kind of detectable radiation; radio waves, microwaves, and other

forms of radiation were commonly used at the time, and routinely detectable. The ships drew seawater into themselves through some unseen mechanism; while the term *vacuum* is used to describe the process, there was no visual evidence of an actual vacuum being created or sustained.

This entire process - from Humans first noticing the ship to its eight components beginning to take on seawater - occurred in under an hour. Earth's governments, having never faced a situation even remotely like this, scrambled to respond. With so much happening, so quickly, no real records were kept of emergency conversations between governments and their leaders. We can assume that rapid communications went back and forth, as governments attempted to arrive at a plan of action. Given the nature of international relations at the time, it is likely that many governments simply took their own initiative, regardless of what others were discussing. Those governments may, in fact, have simply triggered a cascade of responses. One country launched aircraft, and so all the others did as well. Speculation aside, we know the end result: in under half an hour after the ships began taking on seawater, Earth's combined military forces were brought to bear. It being so evident that the invaders were intent on stealing precious water from Earth, the planet's militaries set out to destroy all nine ships.

Squadrons of small atmospheric military fighter planes, dispatched from more than a dozen larger militaries and equipped with a variety of ordinance, streaked toward the eight ship hovering over Earth's oceans. More critically, nearly the entirety of Earth's intercontinental fission missiles were launched and directed toward the orbiting mother ship. The response was not as coordinated as this narrative may suggest: different countries responded at different speeds, and launched different military assets. Each country equipped with nuclear missiles responded in relatively close order, suggesting some degree of coordination between them. However, the planet-side response was less coordinated. Each country launched assets toward the "tanker" ship nearest it, and likely had different procedures and response rates for scrambling those forces.

We of course have no way of knowing what the invaders thought of this multi-pronged, loosely-coordinated attack. The evidence suggests that they simply disregarded it as being incapable of damaging their craft, for there were no reports, and no visual evidence, of any kind of defense or counterattack. There was certainly nothing that Earth's science fiction works would normally suggest: there were no force fields, no defensive lasers, and no mysteriously invulnerable ship hulls. Thousands of conventionally explosive missiles were launched at the eight "tankers;" each of the eight sustained meaningful damage. They immediately stopped taking on water, and in at least three cases seemed to suddenly release what they had already taken aboard. A second wave of air-to-air attacks damaged them further: two tankers crashed into the ocean, four began to rise toward space, and two had obvious signs of difficulty maintaining their hover over the ocean's surface. One of the four that attempted escape happened to be near a naval task force, which launched considerable ordinance, causing additional and heavy damage that caused the ship to fall into the ocean.

The nuclear missiles struck the mothership in a ragged volley, essentially vaporizing it. A third wave of fighter jets engaged the "tankers" unevenly, as the remaining five tankers dropped suddenly into the ocean. It was later discovered that these tankers were uncrewed drones, and researchers postulated that the destruction of the mothership rendered them inert. Three, located over extremely deep portions of the ocean, were never seen again. The other five - seriously damaged but mostly intact - were accessible to Earth's oceangoing vessels. These would prove invaluable in the coming decades.

The immediate aftermath was chaotic. World leaders quickly converged in a series of meetings, followed rapidly by joint meetings between their countries' militaries. Your experiences today might lead you to expect immediate cooperation and decisive action; that was not the case at the time. There were numerous arguments about what to do, who would be responsible for doing it, and how information might be shared between countries. Those

arguments continued for years. The only immediate agreements were to dispatch joint investigation teams, including members from all large countries and major militaries, and to share all information globally with researchers, scientists, engineers, and so on. Those investigations of the "tanker" ships began less than a month after the Incursion.

Review and Discuss

1. What were some of the impacts of fossil fuels on Earth in the 2030s?
2. How can an external threat act to unify different groups who are placed under a shared threat?
3. Few pictures exist of the invading mothership; what do you imagine it looked like?

Further Reading

A Human's Guide to the Galactics - London, Francine

Fossil Fuels: Where We Came From, Where We're Going - Singh, M. N.

2040: Discoveries

The years following the First Incursion were tumultuous, to say the least. The social impact of the Incursion, and the speed with which it occurred, frightened most Humans. Most world religions experienced a major uptake in membership and activity, as Humans sought for the comfort of a higher power to explain what had happened, and to offer them a sense of safety. Riots, calls for government action, looting, and general civil disobedience were widespread in the months immediately following the Incursion, and numerous smaller governments simply collapsed under the strain. These were typically absorbed by larger neighbors, until by 2040 the number of Earth governments had fallen from a high of nearly 200 to something closer to 150. Of these, some 43 maintained a gross domestic product of more than $250 billion dollars, the Earth's benchmark currency at the time. These countries, which not coincidentally fielded the Earth's largest militaries, education systems, and other institutions, became the leaders in the post-Incursion struggle to understand what had happened.

A so-called "Gang of Ten" major countries, the only economies with a gross domestic product of more than $1 trillion US dollars, became the true movers of the world. Many smaller countries that had not been absorbed by neighbors were annexed to these economic giants. It is estimated that, by 2040, some 30% of the world's economy was bring poured into post-Incursion research, in an attempt to understand the invaders' ships, technologies, culture, motives, and likelihood of returning.

As you have learned, one of the first discoveries were that the eight "tanker" ships were either autonomous or remotely-controlled drones. They carried no crew, and had no quarters for crew. The ships were predominantly a large holding tank for water, supplemented by machinery and electronics that made the ship work. Maintenance tunnels honeycombed the interior structure, but as

these were perfectly round in cross-section and nearly featureless, they offered no clues to their creators' morphology. Additional discoveries followed, and these would all be key to the decades that followed.

The first equipment to be isolated and definitively identified was the shipboard power supply. The main power source on each ship was relatively small, occupying somewhat less space than a quartet of modern personal ground-transport vehicles. Once identified, researchers began finding smaller versions attached to equipment all over the ship. Each was a miniature of that main drive, with the exact same features, proportions, shape, proportional mass, and so on. Only a few months were needed to understand the nature of the engine, its capabilities, and - most importantly - how to duplicate it. Researchers of the time described it as "deceptively simple." Named a *quantum tap*, each device essentially pulled a predetermined amount of energy out of the very fabric of the universe. The energy was apparently limitless, entirely non-polluting, and provided in a steady, predictable stream. A unit that you could hold in one hand could easily power an entire large home; power output increased logarithmically with the size of the unit. Numerous units were retrieved from the accessible ships, and mass-production facilities were quickly created to produce more of these. Most were immediately reserved for military applications, although several larger units were installed in major cities to substantially reduce the carbon emissions associated with fossil fuels.

The scientific understanding engendered by the quantum tap led to an almost incidental set of discoveries, which in turn led to the realization of a long-imagined invention in Earth's science fiction narratives. Nicknamed the *ansible*, the *quantum-entangled communicator*, or QEC, enabled real-time communications between small, lightweight devices that could be powered by a walnut-sized quantum tap device. QECs were also easy to manufacture, and quickly became a dominant form of communication infrastructure on Earth. Again, most production output was initially reserved for military use, but as production scaled up, handheld devices

owned by individual Humans became commonplace, especially in wealthier economies.

Advanced in computing were next. Both optical and quantum computing had been long considered obvious next steps by Human scientists, although by 2035 neither had been deployed at any kind of scale. Taking cues from both the QEC and computing equipment found on the Incursion ships, researchers were able to perfect fast, incredibly small quantum computers. By 2040, a computing device the size of your big toe contained more speed and power than a room-sized supercomputer of just a decade prior. Once again, the majority of these devices were allocated for military use, although enough made their way into other hands to have profound impacts on a number of fields. The field of artificial intelligence began to finally move forward, assisted by the ready availability of small, powerful computing engines. While the AIs of this period were far from *sentient*, they were certainly becoming more *intelligent*, able to ingest an incredible amount of data, discover new correlations, and make increasingly accurate predictions.

Given the three largest breakthroughs discussed so far, and their almost exclusively military use, you may wonder what Earth's militaries were doing at the time. Twelve of the planet's largest militaries, including all but one of the Gang of Ten, were placed under the control of a central planning authority. Nominal command over military units and assets remained with each country, but these countries attempted to coordinate their efforts to develop and deploy new equipment and techniques. Their primary mission, of course, was to prepare for a second Incursion, or an even larger-scale invasion, in the future.

This dedicated focus by so much of Earth's militaries left a power vacuum. Without the threat of military retaliation from their larger neighbors, many smaller countries began using their militaries - many of which were little more than well-equipped gangs - to oppress their own populace, attack weaker neighbors, and so on. This behavior was allowed to continue well through 2041, almost because the Earth's major countries were so preoccupied

with preparing a credible defense against future alien attacks. But after a series of particularly brutal coups attempts amongst smaller countries on the African continent, the Gang of Ten decided to take action. In hindsight, their action was brutal and inhumane; at the time, it may well have been perceived as the only way to quickly end a growing problem and get back to the business of protecting the planet. In short, they simply identified the problematic countries and destroyed them. In one evening, known decades later as the Night of Horror, the entire populations - military and civilian - of more than a dozen aggressor countries were simply wiped out. This brazen and callous action created an immediate cessation of all other hostilities on Earth. Even rioting amongst citizens in countries with poorly-equipped law enforcement came to an immediate halt. Through spokespersons, the Gang of Ten's leaders made it clear that the Earth's one and only priority, and only activity, would be to prepare for alien war. No distractions or deviations would be tolerated.

The Gang of Ten stopped short of placing countries under martial law, but history indicates that it wasn't necessary. Almost as if it had received a horrific slap in the fact, Earth's population got back to work. Several more smaller countries voluntarily merged with larger neighbors or with one of the world powers, stabilizing their populations and enabling them to contribute to the new world effort.

The weapons used in the Night of Horror were another invention derived form the quantum tap. Rail guns had been a military reality since the early 2000s, including plasma railguns tested in the early 1990s. With the limitless, high-volume power of the quantum tap, a new generation of railguns had been developed to combat future alien invaders. They launched large-format sabot rounds at more than 10,000 feet per second (approximately ten times the speed of sound), delivering more than 180 megatons (753 quadrillion joules) of damage - more than the estimated damage of the largest nuclear fission missile every built by Humans. These released no radiation and had no lasting aftereffects, but they

served to entirely vaporize large geographical areas, and cause aftershocks that largely destroyed even greater areas. The main environmental impact was an extreme amount of dust and debris thrown into the atmosphere, which led to another set of challenges - and innovations.

Atmospheric pollution, and derivative effects like climate change and warming, had been a problem for Humanity since at least the 1980s. Three main culprits - ozone, methane, and carbon dioxide - had been identified as main problems. Combined with the sudden release of dust into the atmosphere, the Earth was suddenly facing deep environmental troubles. Many environmental advocates of the 2040s pointed out that the damage to the atmosphere was so severe, we might want to just give the Earth to any future alien occupiers, as we'd come close to rendering it useless for ourselves.

Once again, the limitless power offered by the quantum tap, combined with new manufacturing techniques used for QECs, quantum taps, and quantum computers, placed a solution within reach. *Atmospheric moderators* we created to begin addressing the problems. Deployed on large, airborne platforms - which were able to remain afloat indefinitely thanks to quantum tap-powered rotors - the modifiers drew in tremendous amounts of air. It removed dust using strong electrical charges, and then split carbon dioxide into solid carbon and pure oxygen. Ozone was split and recombined into oxygen molecules. Methane was split into solid carbon and hydrogen - much of which was combined with oxygen into water, and used to help soak the solid wastes to be dropped back to the planet's surface. Hundreds of modifiers were deployed to the most-impacted areas of the planet, and began to quickly make a dent in the atmospheric problems. To be sure, solving the atmospheric problem in a decade would have required *tens of thousands* of modifiers in action ay once, and eventually Earth would have deployed those quantities. But by 2042, the problems were in noticeable decline.

A final invention of the early 2040s - or at least, the beginnings of a final invention - came from Humanity's growing understanding of the Incursion ships' drive systems. Easily the most complex,

opaque, and unfamiliar component of the ship, the drive engine was theorized to directly manipulate gravity. The drive engine itself seemed to be the motive force behind the "vacuum" that drew seawater into the ships' massive holding tanks. Positioned at the aft end of the ships, the drive systems appeared to have no emissions, and appeared to be unshielded, suggesting that they produced no dangerous radiation. Their only connections - apart from mechanical fastening to the ships' hulls - appeared to be an input from the main quantum tap power supply, and a control connection to the ships' quantum computers. The engines were readily disassembled, and Humanity was by this point starting to develop some strong theories on how they worked. A special project to remove an intact drive unit from one ship was underway, with hopes of powering the unit and discovering exactly how it worked, and how to control it.

The next problem became one of resources. Earth is a finite well of them, with only so many minerals, gasses, and liquids to go around. Humanity would soon need to look elsewhere for sorely-needed raw materials.

Review & Discuss

1. Can you research the Gang of Ten? Which countries did it consist of, and where were their geographic territories on a modern map?
2. Do you use quantum taps in your everyday life? Where?
3. What is a *sabot round*? How might this kind of round deliver an extreme amount of damage?

Further Reading

Atmospheric Modifiers: Dangerous Beginnings to Today - Eimerman, G.

Big Inventions! 2000-2050 - Woodring, M.

2042: The Build-Up

As Humanity's mastery of new technologies grew and improved, Earth began putting its new inventions to work.

At the forefront of innovation was Lyborne Industries. Formerly a small firm dealing in specialized manufacturing robots, Lyborne quickly recognized the potential of a key trifecta of technologies. First, the quantum tap, providing free, limitless power. Second, the QEC communications systems, enabling instantaneous communications across almost any distance. Third - and this was where Lyborne's strong connections with the world' militaries paid off - was the advanced gravitic drive systems salvaged from the alien "tankers." In 2042, a team led by Lyborne engineers successfully recovered, disassembled, and duplicated a drive system, creating the ability to produce more drives almost on-demand. Lyborne's first viable, mass-produced product was a series of *auto factories*. These self-contained, self-powered, robotic factories were assembled in Earth orbit, and then launched - by means of enormous rail guns - toward the half-dozen or so largest masses in the solar system's asteroid belt. Totaling somewhat less than the mass of Earth's Moon, these asteroids were nonetheless some of the most valuable, concentrated raw materials in the solar system. Lyborne's auto-factories, launched at unsurvivable-by-humans speeds, arrived on-target in a matter of weeks, and immediately began working. They were controlled in part by a new generation of AI, capable of dealing with the ever-changing local conditions without continual monitoring from Earth.

Previous Human plans for exploiting the asteroid belt's resources usually included mining raw materials and then shipping those back to Earth. Lyborne's approach was more complex, and was made achievable only through the real-time monitoring and communications ability of the QEC, with the assistance of new-generation AI controllers. The Lyborne factories not only extracted

valuable raw materials - particularly iron and carbon - but also assembled these into larger factories. These second-stage factories, in turn, consumed even more raw materials and produced the largest rail guns mankind could imagine - complete with enormous sabot rounds. Each completed gun was complete with its own gravitic thrusters, enabling it to quickly turn to almost any bearing. Each included a powerful onboard quantum computer, and was powered by an array of quantum-tap power sources. Each rail gun was nearly a kilometer long, and fired rounds massing in excess of 60,000 kilograms. These "long guns" had a single purpose: to smash the next round of alien invaders in space, before they could even reach Earth. The sabot rounds exited the rail guns at a respectable percentage of the speed of light, and delivered an almost unimaginable amount of force upon impact. The real advantage of Lyborne's automated manufacturing strategy was that more than three dozen of these rail guns - deemed the "Winchester class" - were produced before the end of 2043. Production continued with approximately 2 new guns per month, eventually resulting in systemwide arsenal of almost 90 guns by the end of 2045. These were deployed in a sparse array around Earth, pointed outward, and constantly monitored. They were also equipped with primitive new military AIs, capable of more rapid targeting, firing solution calculation, and response capabilities than a human controller.

Earth's monitoring capabilities grew as well. Each rail gun was equipped with passive and active microwave scanners - telescopes and radar, essentially, two technologies that were well-advanced by the early 2000s. While still only capable of perceiving incoming threats at no more than the speed of light, their ability to immediately communicate back to Earth via QEC, and the onboard quantum computers' own limited ability for self-directed response, Earth's militaries began, for the first time, to feel somewhat safer.

Earth's own heavy industries were not sitting idle during this build-up period. Gravitic drives were adopted for orbital launches, enabling a far greater number of orbital missions, and enabling new, cheaper re-usable "space trucks" to haul materials and supplies back

and forth. The goal was a military space station, capable of housing a crew of dozens, and equipped with its own defensive rail guns, passive sensors, computers, and communications gear. Named Ares for the Roman god of war, the station was also equipped with its own gravitic drives. Upon completion, Ares was moved out of Earth orbit, the idea being to separate the station from the likely target of any future invasions. Experiments had shown that the gravitic drives rapidly lost efficiency the further a craft moved beyond the plane of the elliptic, and so Ares was positioned only somewhat above that plane, roughly between the orbits of Mars and Earth. Food supplies were supplemented by extensive onboard hydroponics systems, which also helped provide clear, breathable air to the crews. Large, water-bearing masses from the asteroid belt were positioned near the station, and were mined for clean water. While still requiring support from Earth, Ares was designed to be self-sufficient, if not terribly comfortable, for periods of up to a year.

But Ares Command - the nickname given to the international military leadership assigned to the station - still worried about the next alien invasion. Even with a growing arsenal of sensor-equipped rail guns in the solar system, military commanders felt blind and deaf. Accustomed to living on a world where information was only ever a moment away, the simple physics of light speed and the sheer size of the solar system made gathering information difficult. An object as far away as the Sun could take a minimum of 16 or more minutes to detect via active microwave scanners; passive scanners were faster, since they simply received light, but offered lower resolution and detail. To help combat this lack of information, a third major technology project was launched in mid-2043, just as the first wave of Winchester guns were coming online. Also built by specialized Lyborne auto-factories, a horde of Oculous satellites was deployed throughout the solar system. Chewing away at asteroids - including many smaller ones that happened to be rich in rare earths and other necessary elements - auto-factories produced hundreds of these small satellites. Equipped with a small gravitic drive, a very basic quantum computer, a quantum tap to power it all, and

- most importantly - a QEC to report back to home base - the Oculous satellites relied entirely on high-resolution passive imaging systems. Their small size, coupled with essentially zero radiation output, made them extremely stealthy. Their ability to observe their surroundings, plot their own complex courses, and remain entirely self-sufficient provided Ares with the "eyes in the sky" that they needed. The "Oculous Cloud," as it came to be known, zipped around the orbits of Jupiter and Saturn, looking both inward and outward for any signs of alien life. By the end of 2045, thousands of these drones had been deployed. Given the size of the solar system, that made the "cloud" exceptionally sparse, but it was hoped that the quality of their optics, and the drones' ability to self-position, would help provide as complete a picture as possible. New drones continued to be brought online, and with an estimated service life in the decades, the "Cloud" would gradually provide an ever-greater look at the solar neighborhood.

The simple math of the solar system would continue to make defense - and offensive planning - a challenge. Consider: Earth's maximum distance from Jupiter, assuming the two planets are on opposite sides of the sun, is 928,081,020 kilometers. The furthest element of the Oculous Cloud could be up to 945,000,000 kilometers away from Earth. The speed of light is just about 1,080,000,000 kilometers per hour, which means an object near Earth wouldn't be "seen" by the furthest Oculous drones for just under an hour. Thanks to the QEC, that drone could immediately report its findings to Ares, but in a battlefield situation, not knowing something for an hour is a *very* long time. Little was known about the alien ships' maximum speed; while the small gravitic drives on the Lyborne auto-factories and Oculous drones were capable of moving those small, unmanned craft at almost a tenth the speed of light, the aliens' larger drives were in theory capable of much greater maximum speeds. It was unknown, however, what velocities the aliens themselves could tolerate. The "tankers" were, from all evidence, designed to be unmanned; the "mothership" was destroyed and could not be examined for evidence of its crew's hardiness, or for

evidence of inertia-compensating technologies. Earth's hopes were pinned largely on the QEC's faster-than-light communications, and the ability of the Oculous drones to coordinate with the Winchester rail guns in an automated first-strike response. The simple vastness of the solar system made these hopes tentative at best. Jupiter's orbit stretches 4,887,577,728 kilometers in length. Even with 20,000 Oculous drones - a far smaller number than had been deployed by 2045 - each drone would still be almost 250,000 kilometers apart. Each drone could obviously only observe a small amount of the sky at a given period of time, leaving significant "blind spots." Ares Command estimated a need for more than 200,000 drones in order to provide sufficient visual coverage of the outer planets, as well as coverage both above and below the plane of the elliptic. Humanity would *never* come to achieve that kind of coverage.

With all of the progress in space, challenges abounded on Earth itself. The so-called Gang of Ten countries continued to work more and more closely, and by 2045 their complex inter-alliances had effectively created two meaningful governments on Earth - both of which were in serious negotiations to form a single world government. By this time, many politicians - and their constituencies - had forgotten the urgency from the nearly decade-old Incursion. Lingering fear and anxiety were turned to political ends, sculpting the one-world government that had for so long eluded Humanity. This is not to suggest that a one-world government was utopian or idyllic, although from a certain cold perspective it did begin to create some efficiencies.

Review & Discuss

1. Lyborne Industries remains a powerful and influential Galactic player. What are some of the company's current endeavors?
2. What is the fastest speed a gravitic drive-powered ship has achieved?
3. What successors to the Winchester class of railguns are in use today? How are they different?

Further Reading

Charles Lyborne: An Unauthorized Biography - Lowry, S.
Lyborne and the Mid-21st Century - Gannon. C. T.
The New Long Gun for Space - Anderson, W.

2048: Side Effects

2047 was a difficult year for Earth, featuring an almost unprecedented number of devastating weather events and natural disasters. It seems as if the universe itself was ganging up on the poor planet. North America's Eastern seaboard was hit by a record number of Category-5 hurricanes, leaving devastation in their wake. Earthquakes on the continent's West coast led to numerous tsunamis in the Pacific Rim region. Outbreaks of locusts and other crop-devouring pests, combined with drought conditions throughout many areas, created significant problems globally. It became clear - or at least, was made clear by politicians - that Humanity could not survive by continuing to hoard resources on a national basis. Combined with the threat of a second alien incursion, the Gang of Ten was finally, in 2048, able to achieve the beginnings of a single world government.

The United Nations was in effect abandoned entirely, having been on the verge of collapse for years. The new Earth Government (quickly shortened to "EarthGov" by the news media) was headquartered in the traditionally neutral former country of Switzerland. Most of Earth's former countries remained intact as Administrative Districts, further dividing themselves as needed into Administrative Units, counties, and, for larger population areas, cities. Control over all life- and safety-sustaining resources was ceded to the new EarthGov, a seemingly practical and restrained transfer of power that in fact led to EarthGov essentially controlling everything on the planet. As had always been the case in federalization situations, EarthGov quickly began using its monopoly over resources to strong-arm Administrative Districts into adopting laws and regulations that created a more uniform legal structure across the planet. Districts that declines to, for example, pass laws regarding the use of martial law, or that failed to pass uniform corporate governance code, found themselves wanting for precious

resources like clean water, fossil fuels, quantum tap generators, grains, and so on.

EarthGov was organized, as it is today, into four main branches of government. The first, and most powerful branch, was the World Parliament, responsible for passing all global legislation. Parliament consisted of two halves. The upper house, originally named the Council of Governors, included a single legislator from each Administrative District. They could not initiate legislation, but could amend or veto bills passed by the lower house. Today, the upper house has evolved into the Permanent Council, and members continue to serve ten-year terms with no term limits. The lower house, named the Council of Representatives as it is today, consisted of one legislator from each Administrative Unit, with a maximum of 10 per Administrative District. The resulting total number of members was roughly similar as today, although today of course the count is based solely on population distribution and not administrative boundaries. Members served (and serve) a five-year term, and cannot serve more than two consecutive terms nor more than four lifetime terms. Membership to both houses was, and is, based on direct vote of the populace.

The second branch, the Office of the World Executive, was responsible for executing the laws passed by the World Parliament. Modeled after existing parliamentarian democracies on Earth, this branch's leader, the World Executive, was selected by the political party holding the most seats in the Council of Representatives, and served while that party retained a majority in the Council, or until the party itself selected a replacement.

World Court formed the third branch, consisting of 39 justices, any 13 of whom would hear a given case. Justices were appointed by the World Executive, and confirmed by the Council of Governors. Modeled after other "Supreme Court" institutions from previous Earth democracies, each justice rotated through one of three Court "regions" to hear cases from that region.

The fourth branch of EarthGov was a novel addition, designed to allay fears of smaller countries that were subsumed by the new

global government. Today, the Forum of Last Resort is a way for groups of citizens to formally protest, and potentially overturn, unpopular or unreasonable laws. Originally, however, the Forum was a way for a country - now an Administrative District - to request a summary veto of laws felt to be overly burdensome. The Forum operated entirely independently of the Court, and could essentially render only a binary decision: the law under challenge stayed, or was entirely repealed. Forum membership operated something like jury duty: citizens were selected for mandatory duty as needed - creating a somewhat random environment, and making it risky to bring up anything but the most serious problems. Legislators also made challenges tricky by bundling numerous provisions into each law. Challenging such a law often meant running the risk of overturning beneficial provisions as well as onerous ones.

The immediate and practical effect of EarthGov was a complete cessation of all remaining military actions. The militaries of most nations were co-opted by EarthGov; remaining militaries - mostly from smaller, more violent countries - were nominally disbanded. Many were in fact re-formed into police forces for their Administrative District, although EarthGov's larger military removed, for the most part, all but basic armaments needed for peacekeeping. Another effect was a better distribution of global resources, particularly food, water, and medical supplies. The worst suffering was alleviated, and reconstruction efforts in damaged areas were stepped up more evenly. With the sudden elimination of national borders, people could be quickly repositioned from blighted areas to ones that needed, at the very least, large amounts of manual labor. This is not to say that such relocations raised no objections, but some of the world's smartest project managers made sure the new labor pools were put to good local use, and over time most objections faded.

Hydroponic technologies perfected for use aboard the Ares space station were deployed planet-side to relive hunger problems. This incidentally resulted in an unintentional global shift toward a more vegetarian diet. Ares Command personnel had already all

but discontinued non-vegetable foods, based simply on availability and sustainability aboard the station. This trend gradually spread globally, as foodstuffs were reserved for Humans rather than for livestock, and as arable land was dedicated to higher-density vegetable farming.

It is easy to look at the years around 2048 and imagine a dystopian past: collapsing world governments, natural disasters, droughts and crop loss; the emergence of a world government, the shift of human dietary customs from omnivore to herbivore. In fact, all evidence suggests that Humans living in 2048 may have been better off than Humans from almost any preceding time period. Quantum taps offered free, unlimited power across the globe, reducing fossil fuel use to just a few legacy industries. After initial food shortages, a huge variety of healthful, natural foods were available to everyone. Industrial production continued to rise, both in space and planet-side. Miniaturized, specialized Lyborne autofactories produced medical equipment and supplies at an almost endless rate, making quality medical care easier to provide across the globe. A general consolidation of Humans to more habitable areas, particular to denser urban population centers where services and products could be more easily delivered, raised the quality of life for many.

It is also important to understand the effect EarthGov's formation had on the planet's domestic output. Numerous industries, particularly in legacy fields, consolidated heavily. Much of the world's domestic output began to shift even more to science and technology than in years past. As more and more military investment shifted to space-borne construction and production, more Earthbound workers were needed to design robotic workers and factories, program them, devise new monitoring systems, and continue to understand more about quantum tap, QEC, and gravitic technologies. By 2049, approximately a third of Earth's working adults were employed in these and other technical fields. This shift could not have come a moment too soon, for Earth had less than a decade before their expertise, inventions, and plans would be put to

the test.

Review & Discuss

1. How do hurricanes damage population centers? What measures are in place today to prevent and mitigate these disasters?
2. How do today's dietary patterns compare to those of 2048?
3. What event led to the Council of Governors being renamed and re-formed?

Further Reading

EarthGov: Origins and Modern Practices - Gannon, T.
The Decade of Devastation: 2046 to 2056 - Szpunar, L.

2057: Second Incursion

At 17:38 UTC on February 17th, 2057, Ares Command received an urgent QEC message from one of the surveillance drones in the Oculous Cloud. An alien ship had been sighted, well above the plane of the ecliptic, headed toward Earth at high speed. The accompanying images were several hours old, but as the craft drew closer the images became more up-to-date. The craft was clearly decelerating. Later analysis suggested that the drone happened to be looking in *exactly* the right area of space when the ship essentially appeared out of nowhere. Part of the original QEC alert triggered other drones in the Cloud to immediately reposition themselves, so apart from the alien ship's initial appearance, multiple viewpoints were available for the entire encounter. These viewpoints were especially useful for later analysis, most particularly the images captured by drones facing away from the Sun.

The ship was enormous, larger than the "Mother Ship" of the First Incursion. Later analysis described it well over a kilometer in length. It was colored a matte black, with an almost featureless hull. There were no visible outlets for drive exhaust, weapons, sensors, or anything. There were no apparent windows or other viewing apertures. It was roughly cylindrical, although each end tapered to a rounded form. From the side, it was almost 600 meters high. The surface seemed to be completely smooth and free of any large imperfections. To give you a sense of scale, the ship was longer than today's ECX Tower in Northern Africa, which stands only 974 meters tall.

Comparisons to the First Incursion "Mother Ship" suggested that the Second Incursion ship was not a "cargo ship carrier." The First Incursion ship had clear seams in its hull where the "cargo ships" had split away; the Second Incursion ship showed no evidence of such seams.

The original drone QEC alert also triggered an automatic, AI-

directed repositioning of all available Winchester railguns in the system. The guns' own gravitic drives allowed them to track the progress of the intruder, and as it drew closer and the Oculous drones were able to more confidently plot its trajectory and velocity, the guns began "leading" the ship, preparing to fire and accounting for the time it would take their sabot rounds to arrive at the target.

The guns held their fire until Ares Command gave the order. Had Ares Command been incapacitated or out of communication, the guns' programming would have automatically released them for firing when the ship drew within a predetermined radius of Earth or the Moon. However, that automatic response was never needed. Ares Command protocols had been firmly established by EarthGov, and it called for immediately destroying the intruder as soon as feasible. An exception was written into the protocol in the event that the intruder was transmitting intelligible communications, or if it held off approaching Earth. This intruder did neither: it was running completely silent, at least as far as the Oculous drones and other listening devices could detect, and it was barreling toward Earth as if on a mission. Fifteen railguns were available to fire at the intruder, although four of those would have risked firing rounds into Earth or Ares itself if they missed. Eleven railguns opened fire almost simultaneously, firing massive rounds - essentially enormous chunks of rock and metal - at the alien ship.

The ship was nearly vaporized. Later analysis suggested that the "throw everything at it" approach may have been overkill; ten of the eleven rounds struck the ship almost simultaneously, delivering an amount of kinetic energy greater than any single Human weapon in history. Most of the rounds continued *through* the ship, leaving a widening field of tumbling debris. Following the Incursion, fierce debates were held over the value of "toning down" the defense protocols, so as to leave some hope for recoverable debris to be studied.

Because the rounds were targeted along the length of the ship, no major portion of it escaped destruction. Numerous secondary

explosions were seen, including at least one bright green energy release that was assumed to be from a failed quantum tap-powered gravitic drive; similar explosions had been observed in various tests over the years. Dozens of Oculous drones were repositioned to survey the debris field. No major machines or recognizable devices survived, and the debris field contained nothing recognizable as a biological life-form. Scientists believed that the destruction of the ship had been so sudden, so complete, and so intense, that nothing could have survived. The technology of the time did not allow for any kind of sampling of the debris field to detect microscopic biological life, and so any too-small-to-see remains would have gone unnoticed.

Out of an abundance of caution, mining drones were dispatched to round up as much of the debris as possible. It was sequestered near the asteroid field for possible future study, although at that point no facilities existed that would have allowed on-the-scene Human investigation.

There were two key takeaways from the Second Incursion. First, the ship did indeed seem to have appeared out of nowhere, quite far "above" the plane of the ecliptic. That was notable, because the ships from the First Incursion possessed only gravitic drives, and experimentation had already shown that gravitic drives would not work at all at that distance from the plane of the ecliptic. It is acknowledged, however, that only the "cargo" ships from the First Incursion were studied. It remained possible that the "Mother Ship" from the First Incursion was equipped with additional drive systems that could function outside the plane of the ecliptic. One researcher from Lyborne Industries put forward a theory: the First Incursion "Mother Ship," as well as the Second Incursion ship, possessed some kind of "warp" drive, which is what enabled it to appear seemingly from nowhere. It exited this "warp" state at a high rate of speed, relying on inertia to carry it to the plane of the ecliptic, where its gravitic drive could become useful.

A second takeaway was that the Second Incursion ship showed no sign that it was aware of the Winchester sabot rounds headed

toward it. It performed no obvious evasive maneuvers, and took no obvious defensive reaction. If it had any defenses, they were either unable to detect or deter the incoming rounds.

The affect of the Second Incursion on Earth society was profound. Groups that had, in the 20 years since the First Incursion, suggested dismissing the event as a one-time thing, were immediately silenced. Support for the still-young EarthGov became concrete and unwavering. Humanity quickly came to grips with the fact that we were not alone in the universe, and that we were not safe. A few small groups pointed out that the Second Incursion could have been an attempt at peaceful contact, but the vast majority of Earth's population continued to support a "shoot on sight" protocol for dealing with further incursions.

Even those small "peaceful contact" groups could agree with the rest of Earth's population on one thing: more defenses were needed, and they were needed immediately. Next time might not bring an ship - it might bring an armada.

Review & Discuss

1. How would you calculate the kinetic energy released by the Second Incursion-era Winchester railgun sabot rounds?
2. How to the Oculous images of the Second Incursion compare, in terms of quality, with the images captured by today's SystemVision drone arrays?
3. The Oculous drones of 2057 were limited mainly to visible light and microwaves for detecting ships. What technology would they have needed to detect a ship emerging from a Jump point?

Further Reading

The Science of the Second Incursion - Wilson, M.
Fire First! The Tactics of Ares Command - Shields, G. D.

2058: Defensive Buildup

After the Second Incursion, Earth's population became essentially united in ensuring the planet's survival. "Essentially," because factions still existed that there was no actual evidence of the invaders' desire to destroy Humanity. EarthGov, however, repressed these factions ruthlessly in the name of planetary security.

The first reaction was to develop a new class of larger, longer-range, and more powerful railgun cannons. Capable of delivering more than 300 megatons of force, this new "Super Winchester" class was deployed in the hundreds throughout Earth space, particularly in the region where the Second Incursion ships came from. Equipped with more powerful AI fire-control computers and active sensing, they were designed to be almost self-controlled, in the event that Earth's own control stations were disabled.

The Ares command and control station was moved into a secondary role, closer to the region of space where the Second Incursion ships originated. A new, larger station, Hellfire I, was constructed to replace Ares as the system's primary command and control station. Equipped with advanced hydroponics and recycling systems, Hellfire I was designed to survive almost indefinitely - if not entirely comfortably - on its own, in the event that it was cut off completely from Earth resources. It was positioned well away from Earth's orbit, hopefully removing it from direct attack line, and equipped with numerous QEC systems to maintain real-time communication both with Earth and with the tends of thousands of military assets now in space.

In 2059, an accidental discovery changed Earth's approach to space-borne autonomous weapons. It had been well-established that a gravitic drive created a propulsion field that also somehow negated most inertial affects. That negation was, however, limited to the main framework of whatever craft the drive was mounted to. Passengers and contents were subject to the full laws of physics,

meaning acceleration rates were sharply limited. What engineers and scientists had not pinned down, precisely, was the mediums which could successfully conduct the "negation field" generated by the drive. Both steel and composite materials worked demonstrably well, so the effect was not akin to electrical conduction. An advance was made when a team of engineers decided to mount a gravitic drive to a railgun sabot round. The entire body of the sabot seemed to "conduct" the negation field, keeping the round - which was made up mostly of iron but also a significant amount of non-ferrous debris - from compressing or being damaged in any way, even when accelerated to the maximum of the drive's capability. This resulted in a new generation of Oculous drones, nicknamed the Attacking Eyes. Equipped with hardened sensor systems, about a quarter the mass of a sabot round, and a gravitic drive, these drones could accelerate to more than half the speed of light in an extremely short period of time. Thousands of Attacking Eyes were deployed around Earth's orbit, focused on the area where the Second Incursion ships originated. These would become a new first line of defense: upon detecting an incoming ship, they would immediately notify their neighbors and Hellfire I. All drones in the area would orient on, and track, the invading ship, and wait a few moments for Hellfire I to *cancel* a "suicide" collision run made at maximum acceleration. If Hellfire I ordered an immediate strike, or did not cancel the automatic strike within the allowed time, the drones would accelerate and attempt to ram the intruder. Railguns would provide backup. A central threat-priority system on Hellfire I would designate specific drones and guns to close on specific targets, in the event that multiple invaders appeared; left to their own devices, the drones would simply target the nearest invading ship while railguns would attempt to divide the workload between themselves.

Debates raged amongst scientists and military experts over the continued use of the "throw everything at it" defensive approach. Some scientists and experts contended that leaving *some* evidence for later study was necessary; others insisted that, with no data

on an invader's ability to resist damage, and their demonstrated tolerance for rapidly closing on the Earth, the only option was to go all-out in an attempt to ensure absolute destruction.

Earth was now as prepared as possible for a Third Incursion - or, worse, an entire wave of invading ships. The defensive build-up continued, aggressively adding defensive capabilities and refreshing older equipment. EarthGov, and much of Earth's population, turned full-time toward military pursuits. Nearly every able adult in every place on Earth was trained in defensive techniques and issued basic defensive weaponry, in the event an invader managed to land a force on the planet itself.

Decades had passed between the First and Second Incursions. The next contact with extrasolar life would come much sooner.

Review & Discuss

1. Were a Super Winchester sabot round fired into the Moon, how large of a crater would it make? What other damage could be expected to the satellite?
2. What social problems may have been created by having the planet's population on full alert, and fully armed, for a long period of time?

Further Reading

The Second Decade of Devastation: 2058 to 2060 - Szpunar, L.

2064: First Contact

On June 17 at 13:47 UTC, Earth's third extra-solar visitor entered the Solar System. Appearing from roughly the same point, and at roughly the same track and velocity as the Second Incursion ship, this newcomer was much smaller. Measuring roughly 100 meters in length, it was not the featureless shell of the previous Incursions, but showed clear signs of windows, openings, seams, and other elements familiar to Human construction.

Earth's defensive systems leapt into action. Hundreds of railguns slewed toward the approaching ship and began tracking it, noting immediately that it was rapidly dumping velocity as it neared the plane of the ecliptic. Also noted was the fact that it was not headed directly toward Earth; while moving toward Earth's *orbit*, it was moving toward a place almost opposite the Sun from Earth. As the Attacking Eye drones lined up and prepared for their "suicide runs," the closest ones began picking up massive amounts of radio-wave signals from the ship. These were immediately relayed via QEC to Hellfire I and Ares. The combination of the ship's appearance, behavior, and apparent attempt to communicate led Hellfire I's commanders to cancel the automated attack sequences, although drones and railguns continued to move into attack positions and track the new craft.

Decoding the transmissions took very little time, as they were unencrypted, transmitted over frequencies commonly used for terrestrial radio communications and, most importantly, entirely in English.

> People of Earth! We mean you no harm. We are aware of the prior invasions into your territory, and we denounce them. We wish to open a peaceful communication with you. Our ship is unarmed, and will come to a holding position opposite your planet. Please reply

> on this frequency if we may communicate with you. If we do not receive a reply from you in one hour, we will leave peacefully and never return.

The message repeated across several frequencies on a loop. Hellfire I's commanders were authorized to take any action in defense of the Earth, and after hasty communications with EarthGov via QEC, were authorized to communicate and negotiate with this new alien presence. Unfortunately, none of the drones in the system were equipped with radio-wave transmission capabilities, and so a delay of several minutes was required for Hellfire I's reply to reach the alien ship.

Several hours were required to negotiate the technical particulars of communication. An Attacking Eye drone was hastily equipped with radio-wave transmitters and dispatched to within a few miles of the alien ship to act as a relay. A suitable video-encoding technique, based on television transmissions that the aliens had obviously observed, was agreed upon, and true communications began.

In those first exchanges, only a single alien was seen or heard from. He seemed to speak excellent English without the need for mechanical translation, and gave his name as Tertian. He claimed to be an Ambassador for the League of Affiliated Systems, a governmental and trading association that included some eight dozen alien species. Tertian shared a morphology similar to Humans: bipedal, bilaterally symmetrical, similar head shape and sensory organ placement, and so on. His skin appeared to be somewhat rougher and more leathery, and had a deep brown color.

The first issue raised by EarthGov's representatives was, of course, the ships of the First and Second Incursion. Tertian identified these as belonging to a League member, albeit one that kept mostly to itself except for a certain amount of trade in exotic minerals. He explained that Earth had been under League observation, via remote drones, for some time, although the last drones were decommissioned some decades prior. Apart from automated scouts that

offloaded the drones' data, access to the Earth system was strictly forbidden by League law. The Incursions had, therefore, been extra-legal. Travel through the League was by way of gravitic drives in-system, but by faster-than-light hops - essentially, wormholes from Human science fiction - between set endpoints distributed throughout various systems. General transit through these hops was logged, and it wasn't until the ship of the Second Incursion was logged *out* of a system but never back *in* that inquiries began to be made. Eventually, it was discovered that the ship had indeed been to Earth's system, and had either been destroyed or somehow set up operating in the system. Tertian had been dispatched to investigate. The race in question - which gave themselves no name but was generally referred to as the Videx within the League - had a strong military nature, and the League had feared for Earth's survival.

Further discussions revealed that Earth's segregation was standard League operating procedure for a young, pre-spacefaring race. At a certain point of technological development, just as outlined in many Human science fiction novels, the League would make contact and invite the young race to join.

Tertian then spent some time explaining the general conditions for League membership. Member races had to have something to offer to the League, generally a trade item or service unique to their system or race. Otherwise, the new race would have no means of participating in the League economy. Military power was strictly regulated and licensed, in an effort to avoid exactly the kind of abuse the Videx seemed to have been attempting to commit. As EarthGov's leaders listened and tried to imagine their response to all this, Tertian announced that Earth could not be a candidate for League membership. Despite their having achieved in-system spaceflight - albeit through a shortcut unintentionally provided by the Videx - Earth's obvious armament was problematic, and Tertian doubted Earth would want to give up its military protections.

That did not mean, however, that Earth and the League needed to ignore each other.

Tertian explained that the League's faster-than-light, or FTL,

technology, was franchised only to one of the League's oldest races for manufacturing. FTL drives, allowing ships to traverse inter-system "corridors" almost instantly, were provided to League races, and were closely protected against investigation or reverse-engineering. The corridors themselves were naturally occurring, he explained, and were largely a side effect of the system's major stars and the systems' proximities to other stars. Some systems offered numerous corridors to other systems. Earth's system offered but a single corridor to Alpha Centauri, which in turn offered a single corridor to a more populous League system. Earth's status as a "dead end" in the system, he explained, would be worrying for a normal League member, as it would limit traffic and trade. In Earth's case, he proposed, it was exactly what Earth - and the League - needed.

What the League lacked, he went on to explain, was a place to keep valuables - and secrets. The League operated with many different type of currency, all of which were essentially theoretical and electronic. Recent trade imbalances and economic problems had led League leadership to believe that one central currency, based on some physical element, would be a way to provide stability to the system. All other currencies could be ranked against that "master" currency, and the ability of an individual race to effect inflation or deflation would be limited. Their problem was that no one race could be trusted to hold the physical assets backing the currency. There was, in other words, no "League Central Bank." As a disinterested third party clearly capable of defending itself, at the end of a dead-end FTL corridor, Earth could serve as a perfect central bank. And, like banks throughout Earth's own history, also provide a place for League members to store trade secrets, valuable items, and so on - the galaxy's safety deposit vault.

EarthGov's leaders asked for time to discuss Tertian's proposal.

Review & Discuss

1. How would being at the end of a dead-end corridor help Earth become more attractive as a central bank location?
2. Earth's currency is not backed by a physical asset. What are

some of the advantages and disadvantages of this approach?

3. How was Tertian likely able to gain proficiency in English, prior to his contact in 2064?

Further Reading

The League of Affiliated Systems - A Child's Primer - Kranendonk, T.

Tertian: Ambassador to the Stars - Helmick, J.

Thank You

Thank you for reviewing this sample of *A History of the Galactic War*. We hope you will find this text useful in your classroom, and invite you to return to our online distributor to purchase a complete copy.

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2082: Galactic Bank

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Afterword

Thank you for reading *A History of the Galactic War*. We hope you have found it a useful addition to your studies, and we hope that it has provided some context around this tumultuous period in Human history. As you move into your own role in Galactic society, we hope that the lessons of Humanity's past will not be lost to you, and that those lessons will help guide your own life as a Galactic Citizen.

Sincerely,
The Authors