

The Maverick Clans of the Valles Marineris



by Richard Young

This compilation of histories and reflection on the Valles Marineris Maverick societies was composed by Kimmal of Clan Smol. Kimmal, an experienced citizen with ancestral links to the Paradise neural network, is an adept psychohistorian and instructor. The Maverick Clans, inhabiting cavernous arcologies burrowed deep into the northern canyons of the great valley, have a unique society on Mars. Their tumultuous experiences, spanning close to three complete generations, have become the objects of countless case studies both here on Earth and on the red planet. Their sociopolitical apparatus has been emulated in thought and physical experiments ordered by Pope Carnival, head of the theocratic New Roman Colony on Mars. However, to the frustration of hopeful social engineers, the successes of the Maverick Clans in maintaining prosperous and stable communities have never been echoed. Citizen Kimmal, throughout the decades, has fervently claimed that this is in part due to the particulars of the Tippie movement here on Earth. "The motivations, philosophical foundations, and psyche of the terrestrial Tippie movement in the middle of the 21st century are crucial elements of the Valles Marineris Clans," Kimmal once elegantly explained to me. The study you have before you is a brief survey of the Maverick Clans, as told by an insider. It is, like all histories, an interpretation.

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The self-styled Maverick Clans of the Valles Marineris are independent communities situated in the northern region of the Martian great valley. Each individual settlement, or clan, is housed in an extensive, underground structure not unlike a miniature arcology. They are essentially self-sufficient units, physically severed from one another by considerable distances, that engage occasionally in the trade of actual commodities and constantly in the traffic of data. In fact, with optimized techniques of low-energy custom goods production in practice daily, it is information (in the forms of guidance and knowledge) that is most valued in this society. Because the harsh conditions on the Martian surface can periodically deter ventures above ground, the commerce of physical goods is mostly, to put it lightly, a product of convenience.

The Maverick Clans maintain a stable and sufficient population of both human and silicon-based Continuum life forms. Individual clans, while isolated from each other physically, utilize their advanced communications technologies to effectively preserve a much larger community. The collective of clans&emdash;through an

interactive matrix of social reinforcement, education, alliance politics, and commerce—forms a city-commune. This organization, constructed out of common alliance, rests atop the sociopolitical network of the clans, and provides the collective with an umbrella of security against catastrophe and crisis.

Much effort has been exerted forth by beings outside the Maverick Clan society to study it and determine its various essentials. In order to have a satisfactory understanding of the clan settlements, it is important to know their terrestrial and early colonization histories. As the current social philosophies in place there are the direct descendants of ones transplanted from Earth, they are easily traced to their roots. The Maverick Clans are the Martian, and some would argue the inevitable, products of a pro-evolution movement on Earth in the late 2030's. This group, popularly dubbed the "Tippies" (from "Techno-Hippy"), was a population of humans that believed in the accelerated evolution of the species. They were considered to be mavericks of humanity—radical and skewed. The Tippy philosophy of "human speciations as survival" was possible largely because by the end of decade, powerful 21st century tools became increasingly accessible. Breakthroughs in nanotechnology, cybernetics, and human engineering occurred; most importantly, [interface technologies] advanced. Interactions between the human being and its surrounding tools became easier and more intimate.

Tippies believed that people should, as bioengineer Carl Tobin said in 2037, "grab technology by the balls and run with it." The growing pliability of devices needed to affect human genetics, materials, and computers encouraged this attitude. Their increased availability threatened to shatter many of the industrial age hierarchies that were in place at the time. Power that was once hoarded by a technical elite was unleashed to the 21st century populations. Tippies embraced the buzzword "liberation," speaking out from the "technology as freedom" movement of the late 20th century. However, the prospect of new technologies such as direct-experience virtual worlds and nanoscopic robots steered the movement down alien roads. Slogans for human freedom ranged from "liberation from misinformation" to the more radical liberation from genetic determinism" and "liberation from physical reality." This revolution immediately sparked intense counterrevolutions and confusion.

As early as the late 20th century, intellectuals had hinted at the possibilities of future developments and the redistribution of influential tools into the hands of the many. These warnings, however, were perceived as mere science fiction stories, and little energy was spent to understand them. When the revolution hit in the 2030's—when it was actually possible for people in cryostasis to be revived, when cell-sized computers danced in your bloodstream, and when plastics could be assembled in garage-sized factories—there was mass confusion over fundamental issues about humanity. Tippies ignored the limits set by prior generations. They felt that humanity had breached a wall of sorts, and a new horizon was visible. Tippies encouraged embracing the new power and setting sail for the new, unknown horizon.

As a result of then-emerging and maturing technologies, there was suddenly renewed speculation on the possible futures of humanity. A surge of hope washed over the world's sullen populous. In the early decades of the 21st century, the human species as threatened by self-engineered disasters. The Earth's ecology, damaged by rampant industrialization, was going through radical and hostile changes. Populations perished as the climate began to shift fundamentally, wars and famine struck suddenly, and pandemic diseases flourished. In the imaginations of many, the possibility of human extinction increased; the future indeed looked grim. Then, as the maturation of nanotechnology² began to change the way people perceived reality as a whole, the concept of humanity's future fragmented with new possibilities of hope.

Many people had feared the technological revolutions of the 21st century—they shattered many long-lived paradigms of power and the stability of reality. Those that embraced the new paradigms had ambitious plans for humanity. Some favored the alteration of the Earth to support human populations once again —a subtle but effective "terraforming" of sorts. This proposal to put forth effort and purge the Earth of industrial diseases had extreme popularity. Others, however, believed that the species had reached a turning point, awaiting transformation. These voices, which grew into the small but powerful Tippy movement, believed that as the tools for genetic and big-manipulation moved out of the engineer's hands and into the tailor's, the survivability of the human species would be secured. The Tippies didn't believe in adapting Earth back to humanity. Instead, they saw the transformation of humanity itself as the future. With these radical and perceivably immoral attitudes, the support for the movement was limited to a dedicated population of perhaps ten thousand. Their plans hindered on Earth, they sought a new place for humanity to metamorphose—that cocoon was to be the planet Mars.

Tippy beliefs about the fundamental nature of humanity accepted an exodus to Mars as a logical maneuver within the bounds of human behavior. Kang Ku-yi (version 3.1), a personality reconstruction of an early Tippy colonist on Mars reflected:

Humans are a species of animal, just like any other. Species, in turn, are like any other system. They will do their thing, running through an optimal loop, until something occurs to disrupt "normal" operation. Once the loop is disrupted, the system will attempt to adapt to the change. Sometimes, the change is catastrophic, and the system is destroyed; but sometimes, the change is countered with adaptation, and the loop is recoded. Placed outside of her usual physical environment, a person will probably die; she, as an organism and a system, is quite inflexible. The human species, however, is a more powerful system. This, in a nutshell, is how a species evolves. Given new challenges, a system always changes. Therefore, the human species is not a "star" any more than it is an "Earthly" phenomenon. That thinking is ignorance. The human species is a system. It will adapt or die. Personally, I'm putting my money down for the latter.

Likewise, the Tippy philosophy about human behavior also included the belief that people were motivated by different levels of desire and held in check by external (i.e. environmental) forces. Without any conditioning, they claimed, people would always behave in ways that directly or indirectly ensured their survival. They would unceasingly strive to maintain sustenance and livelihood, and they would go to work immediately if threatened by real or imagined forces.

Thus, at the individual core level, humans behaved instinctively. People would ally with one another if cooperation could be reached, but they would not hesitate to defend themselves individually if threatened. However, through further conditioning (what we may call "education"), this desire for security could be modified. The resulting behavior, a conflict or synthesis of the instinctual and learned was what made up the bulk of human nature. Therefore, it was vital, the Tippies believed when planning their future Mars colony, to determine how education suppressed, augmented, or dominated instinct (and vice versa). It was thought that education and conditioning could pad selfish survival instincts with communal and societal needs in order to form a desirable matrix of human behavior.

When their survival needs, both instinctual and conditioned, were threatened by actual or perceived dangers, people acted to restore security. With the proper education, people would value the lives of their loved ones above their own, fast to gain spiritual salvation, or place themselves in harm's way for an intangible ideology. The theory that, in contrast to the Tippy philosophy of self-evolution, stated that Earth could be readapted to

meet human needs fed on these impulses and desires. As a result, resources needed for "planet-healing" that could be found abundantly in space but rarely on Earth motivated people to think seriously about colonies beyond our terrestrial home—even if those settlements were to be temporary or in the minority. On Mars, an environment hostile to human beings, the gestalt of atmosphere, water, food, warmth, physical security, and mental stability would dominate human needs. The Tippiies were pressed to address these requirements within a successful permanent community. The solution that, over a couple of violent and tumultuous generations, evolved out of their early yearnings was a multi-layered approach that would satisfy the needs of the individual while instilling a desire for community.

The 22nd century manifestations of Tippy philosophy are the clan-based city-communes of Valles Marineris. These Martians have a technological complex that is the direct coupling of powerful 21st century technological revolutions with the dangerous Tippy attitude of radical "reality bending" and customization. Technology in the present-day clans has boosted the adaptability of the individual human; likewise technology is much more adaptable to the individual user. To use crude 20th century terminology, every person is able to hack more of the things in her environment, including herself. As people and their tools reach a point of symbiosis and not servitude, their individual and collective relationships take on different meanings and functions.

In light of self-advancing computer technologies, the most important trait of human clan members is that they are human. They, unlike their expert system or neural network neighbors, are creative, emotional, and hyper-logical. Surrounded by her nanoscopic factories, computer-constructed realities, telepresence robots, and mature expert systems (and empowered with the ability to learn how to customize those technologies to herself); a Tippy descendant becomes the nucleus of an extremely intelligent system able to physically affect many things. This was termed "Intelligence Amplification" (or IA) by many computer scientists in the late 20th century in defiance of the then popular buzzword "AI." The potential power wielded by one human-augmented system is in turn checked by the fact that this power is common within the clans.

The high levels of communications technology, extensive neural networks, and intuitive interfaces utilized by the common individual in Maverick society make for the efficient production of goods as well as a reality that seems very skewed to the uninitiated. Indeed, when you can interact with someone on a limited basis of touch over thousands of kilometers, tangibly grab data, design your own mechanical computer while in bed and (with the instantaneous help of others) instruct your body to manufacture it, reality takes on a whole new meaning. Wealth and power no longer have industrial connotations in a technology complex where things are easily custom-built.

Relationships between the human and technology also experience a shift. Following Tippy philosophy, the importance of the individual human animal increases within Maverick society as advanced neural networks and expert systems become more integrated and crucial to daily life. As computer software develops, becomes more self-sufficient, and creates more sophisticated interfaces for communication with humans, the gap between human and computer types of "thinking" widens. With the advent of computer network maturation in 2071,3 many philosophers had pondered the similarities and differences between the two potential beings. Early in the search for artificial intelligence, many intellectuals in the computer field sought to judge computers by their emulation of human thinking. The Mavericks on Mars were the first society at large to judge a computer code by its level of maturation—its ability to consistently make sound judgments about a variety of things—and its ability to uphold a citizen contract. To the clans, the quest for "intelligence" in computers seemed as irrelevant for artificial vices as it was for the human being.

In the year 2071, the first computer-based system was given citizen status in a Martian commune. Any clan member that feels ready to accept the responsibility of a sociopolitical citizen contract can seek to be sponsored for maturation. After the individual's internal acknowledgment, the decision is left up to the alliance of clans at large. Three sponsors must be willing to vouch for that individual's ability to make sound decisions and judgments as a voting member of not only a clan, but of the city-commune. At present day, at least one of those sponsors must be a citizen entity of a different life form. Thus, a human that seeks to be recognized as a responsible being and a potential leader must have the confidence of at least one mature computer individual. The "population" of mature computer-based systems is kept relatively low as a voting group due to the difficulty of defining a single computer entity. The collective of programs that becomes a given computer-based entity doesn't become fixed, however, even after the first stages of recognized maturation. In fact, the process never ceases, and whether this is any indication of "intelligence" or not (the holy grail of AI technologies), it is accepted among post-Tipples as an indicator of maturation. The most important steps are, of course, being able to display good judgment and morals when dealing with others in the society.

The cybernetic organism, or cyborg, is a basic member of the human population. The Tippies' fundamental reason for funding an expedition to a potentially habitable planet was so that the human species would be able to take on variations. Already on Earth, speciation was encouraged religiously by Tippie voices; it was a serious solution to the problem of an environment in crisis that would soon be unable to support the people that had damaged it so. The advance of biological engineering amplified these voices, and soon Tippies (many of whom were respected professionals in this very field) physically began to change. The movement was, in essence, a conscious struggle to evolve. Unfortunately for many of the bolder Tippies, this evolution had little precedence in recorded human history, and violent failures were rampant. Likewise, the first Tippy expeditions to Mars landed in a pre-surveyed area of the Valles Marineris and attempted to form artificially replanned sociopolitical communes. Many of these failed as well. However, their failed personal and community experiments were the excess baggage that optimized the human adaptation of the later Tippie communities on Earth and on Mars.

The post-Tipple Maverick Clans owe a great deal to these mutated pioneers, for they entrenched into their mind set the dangerous power of technology. Also, in a physical sense, the early craze of adaptation for imagined survival refined techniques for human engineering. In the clans, generations after the first Tippies set foot on Martian dust, most direct genetic engineering is very small scale. The bulk of human modification had taken place in the earliest of generations, and their most successful descendants continually passed on the heritage of favorable adaptations through simple mating (and maybe some genetic fiddling).

The term "cyborg" is accurate when trying to describe these individuals. The Maverick Martian is an elegantly modified human—most of her changes are at core levels in her organism. If we were to perceive any difference between herself and her 20th century ancestors, it would be the ease with which she orients herself in Mars' gravity, the ability she has to feel what expert systems might feel, and her body's ability to cope with new diseases. The next level above the core individual human is, of course, the buffer zone of technology that she works with everyday. She can communicate with others through perceived realities—visual and verbal from remote locations. That is, if she were trying to tell another clan member kilometers away about an orange, she could draw the orange in the air and show it to him. Likewise, computers can display images to her that she can grab and manipulate as real objects—which might lead to her ability to alter computer programs without learning complicated computer languages. She has, literally, an intuitive grasp on technology.

Within the contemporary Maverick society of 2143, the human condition is artificially supported by an apparatus of technology and social conditioning. At the individual level, a being is created with one

fundamental right. This is the right to leave the clan, the family cell, or the alliance for entry into another one—provided, that is, if there is one that will readily accept that individual. An "individual" is any human or software-based entity, regardless of maturity. Thus, it is theoretically (and actually) possible to define your own relationships as long as others accept your interpretations. Migrations often occur as family-forming, apprenticeship, or cell-joining events. Although they are socially accepted, migrations between clans is a costly affair. Constituting a physical trek between two underground arcologies, these migrations usually involve the combined resources of the emigrating individual, his former cell or clan, and his new group. Clan changes cannot be performed at a whim, and much wisdom and cooperation must be exhibited in their executions.

The present sociopolitical organization of the clans starts with the family cell, which is a subunit for survival. Unless they are the sole group within a clan (a single-family clan, which is unlikely), they are not predominantly self-sufficient. Families can be variably made up of any mix of individuals (carbon or silicon-based) and organized to perform any functions⁴ they are formed when individuals agree to live with one another and unite for any purposes (companionship, love, work, or spiritual survival, for instance).

These cells, however, are only legitimate if the clan recognizes it to be a proper unit. A declaration of "family-hood" is made by the prospective group, but it is not respected unless a previously established family sponsors the creation. This system perpetuates the social norms of any given clan; while the clans may differ in contrast to one another, the families that make up any one clan will be in agreement about general behavior. An individual not contained within a family cell is considered an outcast and socially ostracized by other families. Because food production, among other survival necessities, is performed as a communal effort between cells, a cell-less individual faces a good chance of dying. Families within the Valles Marineris Maverick society can be formed around many themes. For example, there are recognized cells that are professional or skill-oriented in nature (a family of chemical engineers), based on genetic lineage (parents and their children), or spiritually organized (a cell of Zen practitioners).

While different family cells will have varying levels and types of communal output, they are required to perform several fundamental functions. The first of these is the proper guidance of their immature individual's educations. While education and training is a multifaceted lifetime affair involving the family, clan, and alliance commune; its sole responsibility falls on the family cell level. For this reason, many migrations between families are apprenticeship endeavors—individuals are allowed into a family in order to gain a profession or learn under the guidance of a particular instructor. The second fundamental function of a family cell is to work as a part of the clan to maintain basic survival needs. Food production, water collection, energy generation, and other necessities are provided at the clan level. As such, they are essentially the products of cooperation between families, and it is each cell's responsibility to furnish its share of labor and time. A possible third function of the family unit is to serve as an arbitrator, judge, or mediator. When an individual is accused in a conflict, her family takes on the burden of conflict resolution. Thus, individuals never get into disputes with one another—it is always handled at the cell level or above. If two or more proper families cannot settle a dispute on their own, an additional cell is agreed upon by all the parties in question. This additional group is given freedom in the method of conflict resolution used and the punishments suffered. The disputing groups are obliged by social pressures to accept the outcomes of the conflict. In cases where no agreements can be made on a common "extra" party one is randomly chosen by the clan.

The next level of sociopolitical organization within the Maverick communities is the clan. Made up of any number of families⁵ the clan is self-sufficient for most survival needs, and resides in an enclosed environment physically isolated from the other clans. The reason for this isolation is that each clan arcology must find a location within the Martian crust that is close to the subterranean permafrost, from which water can be tapped.

Certain reservoirs of the frozen liquid are closer to the surface than the majority bulk. It is the search for these reservoirs that caused the clans to spread themselves out along the northern region of the Valles Marineris. The clan is organized to provide its families with food, water, energy, air, and immediate physical security. The underground habitat that houses a single clan is a cavernous structure first bored and then reinforced by nanoscopic assembler construction. These sealed architectures usually are abundant in specially engineered hydroponic and soil-grown vegetation. Clan Smol, for instance, has several sectors set aside for multi-story hydrofarms and installations for protein synthesis. These address the general food requirements of the human population.⁶ In addition to these facilities for foodstuffs production, the interior of the Clan Smol arcology is also covered with lush patches, groves, and walls of carefully designed plant life. These provide the actual atmosphere with a processing system while perpetuating an extremely pleasing image for the enclosed, underground environment. The clan also maintains its own communications and energy producing hardware. Microwave transceivers and solar arrays are sometimes surface-planted structures, sustained by a corps of robots or the occasional human party.

Each family cell is required to commit a certain amount of time to clan projects and maintenance tasks, regardless of the cell's actual wealth and requirements. Thus, in addition to the time spent learning, pursuing individual interests, and aiding in family productivity the individual must perform her minimal clan duties as a part of her cell. These include food and water production, goods distribution, basic maintenance, general policing and security, and special situational tasks. Nonhuman systems and citizens may perform tasks for which they are greater suited—computer maintenance and security tasks. Cells of a clan may commonly produce additional commodities or provide special services for themselves and others. Any surplus, planned or otherwise, can be furnished to other families in exchange for other needs. As most families produce a limited stock of goods beyond their own necessities, a barter system of sorts is encouraged. While the basic requirements for life are taken care of at the clan level in a cooperative system and some higher levels of requirements are provided for within each cell, most of the clan's overall material needs are covered by other families in the clan. These goods and services are distributed by direct inter-family trade, a central clan market with costs decided by consensus, or generous redistribution. If a den is successful and balanced, it can provide for 70 or 80 percent of its members desires while addressing 100 percent of their survival needs. The remainder of a clan's material goods can be acquired through inter-clan trade. More importantly, information and advice, which is in great demand, is accessible easily across inter-clan distances without much physical energy expended. Many times, it isn't the actual material good that is needed, but the informational template or guidance on how to create that good with existing hardware. This type of trade is by far the most common at any level, and the distinctions of cell, clan, and alliance fade into the background when these types of commodities are exchanged. Clans that do not meet desired levels of physical provisions distributions internally or through trade usually disperse; the cells or individual members migrate to other clans that are more prosperous. This way, the clans are optimized.

Although each clan is basically self-sufficient and able to provide for its members many things needed for happiness and productivity, there are certain aspects which demand greater attention in times of crisis. These include environmental and atmospheric threats, defense from external aggression, and general emergencies. While each clan is able to handle most crisis within their own settled areas, there are instances in which many or all clans are threatened at once. However, no single clan can provide large scale emergency relief services without converting itself into a specialized state of sorts. For instance, no one clan owns and operates an orbital atmospheric monitoring station. For this reason, many clans form alliances with others in hopes of creating cheap but nonetheless effective defense and disaster relief capabilities for their populations. Because alliances feed off the combined energies of many clans, the cost per clan in terms of material goods, energy, and time is not phenomenally high, and day-to-day life is not affected to a large degree. Presently, the collection of clans is organized into city-commune alliances. The term "city" is used loosely as the clans remain physically isolated from each other and do not reflect an urban environment. The city-commune is made up of the mature citizens of the various clans in the alliance, and it is at this level that maturity is most recognized. In order for an individual to be eligible to engage in a citizen contract, that being must have three citizen sponsors—of which one must be of another life form (convenient for later contact perhaps),

and one from another clan. A small number of citizens serve in actual posts as administrators of defense and other crisis groups. The posts are assigned round-robin through a process of shifts (yearly or otherwise). The other citizens go on with their regular lives, but are responsible for the guidance of their clan affairs at large. In times of extreme threat, such as a renegade clan within the commune or the threat of invasion, citizens from all clans in an alliance discuss and decide on action. In this respect, the city-commune is actually a contract between clans to provide services beyond the spheres of the individual clan. This system, through its citizen contract criteria, also ensures a social continuity of sorts within the various isolated clans.

Clans that find themselves in dispute with one another usually find a way to settle the matter outside the bounds of the city-commune alliance. Many times, in emulation of family cell dispute settlement, a mediation party from an agreed-upon "additional" den is consulted. This system is often successful due to the open communications network that exists between clans and keeps misunderstandings to a minimum. Handling conflicts in this manner utilizes the alliance's social mechanisms of casual interaction and interdependence while preserving its main function as an emergency management organization. However, there are times when disputes within the alliance will lead to city-wide intervention. Because every clan is essentially self-perpetuating (with deficiencies mainly in some luxury-type goods), the prospects for organized aggression against between clans is virtually nonexistent. The Tippy philosophy held that if most of a population's instinctual and conditioned requirements were met, it would not feel threatened or pressured to take what it needs to survive by violent means. The possibility of deviance, excess greed, lunacy, or evil would always be present. However, in a stable sociopolitical system that provided for most of its elements' needs, these deviants would be a minority—a mutation of sorts.

Mutations in the social order are handled first within the family cell. If this proves unsuccessful, the other families within the clan, increasingly threatened by this mutation, can declare the deviant's cell defunct. With those sanctions working against it, the ostracized cell may dissolve into other families. This may leave the social mutation to perish on its own, or give another family the chance to reform it. However, if the deviant somehow garners support within its clan, spreading the problem like a tumor, the clan may be declared defunct by others in its alliance. Steps could be taken to isolate the mutant clan—trade and communications sanctions and threats of destruction. Sufficient migrations of people and mature software systems from the deviant clan could cripple it and cause dissolution. If it proves to be a considerable threat, however, the alliance would eliminate it completely. The technologies of production that are commonplace in the Maverick society require this harsh action—when deadly viruses or disassemblers can be designed and concocted without massive effort, deviancy on a level as seemingly minute as the clan can be quite powerful.

Within the Valles Marineris Maverick society, the education process is an individual, family, clan, and inter clan responsibility and function. At the seeking of maturation, all of these levels must be developed for the individual to be sponsored. Many families are formed as basic educational units; they are there to provide guidance and focus for the education of their biological or adopted children or apprentices. Because most families are also units of economic production, those two foci are interrelated. Advanced communication technologies has provided for a more focused and more universal education—it is common to have many private tutors that assign problems (education is largely problem-based to cultivate decision-making and judgment skills). It is also common to be a part of a team of self-motivated individuals (a continuous study group). Naturally, the best focus for an education is a citizen-master who can teach a complex body of knowledge and techniques (computer programming, 21st century Terran history, edible paste engineering) as well as provide focus for overall education by hiring and providing a good body of tutors and peer groups. No individual stays in school for 7 hours a day, 5 days a week. They work on problems—to solve these they must listen to lectures, watch visual demonstrations, argue with expert systems or peers, compose things (to stimulate creativity), think, and practice physical skills. The education process never ends, so young people or systems can (and invariably do) work with their elders (the 8-year old may be working on arithmetic

and the 9 year old on creative and non-linear thinking). The education process also allows for the interaction of many people. This way, values are checked and reinforced throughout an individual's lifetime.

It is through this complex matrix of providing for the individual's needs through a multi-layered society that provides for the stability of the Maverick settlements. Education reinforces social relationships by encouraging a nonlinear teaching method. Needs are provided for at both the family cell and clan levels, and while the distinction between the two are important, they are well integrated. Thus, each layer is required and dependent on another layer for a survival need. Yet, the advanced technological complex empowers the individual and small cell to perform sophisticated tasks that in the past required large corporations. This network of social, political, and technological factors produces a community that the pioneers of the Tippy movement, with their grand vision of the human future, would be extremely proud of.

A Fictional Illustration

For the purposes of brief, mental illustration, I am including a short narrative based on a fictional thought experiment of mine. The real-time presentation of this piece is available by contacting my cell in Smol.

Our example, Jill, a miner on Mars, is awakened by the entrance of Pete, a fellow miner, into her family's darkened sleeping area. Jill, who is presently quite ill and unable to act "on-site" for the company she belongs to, tells Pete sleepily to leave her the hell alone. For the past two days, Jill had confined herself to bed, miles of rocky crust lying between her flesh and the cold Martian surface as nanoscopic factories warred in the warmth of her blood. But the frigid surface is where her mind is used to being—out beyond the warm comforts of the Clan Peffeq arcology, running her robot puppets through extended consciousness control. Weathering sandstorms, reacting to the Alliance solar flare emergency warnings, and exploring the lithic labyrinth of Hebes Chasma—that is where she wants to be now. It is, in her mind's eye, where her life belongs. After a minute more of prodding, Pete finally gets her to ask him what the problem is.

"We're going to be behind schedule," he explains. "Number three's Brullian-drive train is acting up again." A telerobotic surface transport is experiencing a mechanical problem, and its self-repair systems can't doctor the problem directly. "Number three" is commonly Jill's. After having experienced hundreds of hours as "three's" brain director by remote telepresence, she is more familiar with it than any other operator. It isn't a technical familiarity. Although knowledgeable in the fundamentals of mining hardware maintenance, she is by no extent an engineer or even a mechanic. There are other people for that. However, she can feel her way around "Number three"'s internals and processing matrices—she knows whether a tread is loose by the way it feels struggling up certain craters. If a small part of "three" fails and the self-repair kicks in, Jill feels a tinge of loss and emptiness. When she teleoperates that transport, she ~s "Number three."

"Help me up," Jill starts, shifting her weight stiffly on the bed, but she realizes her presence unit is removed and corrects herself. "Never mind." Pete's image flickers briefly in the dark. He is actually "on-site" at the mining operations center, buried deep in the Martian crust in another part of the clan complex. At the moment, Pete exists in Jill's perceived 3-Space in sight and sound, but his touch can not be felt without tactile underwear. "Why can't you fix 'three' on your own? And where is Dianne—she's supposed to be over there in my stead."

Internal parts of "Number three" begin to materialize above Jill's bed. She slips her hand in the thin fabric of one of her work gloves and begins to take the hardware apart, visually inspecting it and testing moving parts for serviceability. "I can't access enough of the design and control schematics at this moment because Gordon is already drilling. It's taking up oodles of our memory." Pete smiles apologetically. For an interface program, he's quite warm. "Pete," Jill knows, is actually a front end for the mining company's neural network. Within that network are expert systems that know as much and sometimes more about mining hardware and operations than any human (carbon-based) miners. However, none of them are mature enough individually to make important decisions without feeling doubt. Even as a collective, "Pete" often calls on operators like Jill, even though Jill suspects it's for reasons beyond advice at times. Pete, currently, is not yet a citizen.

She plays with the drive train representation floating over her bed for several more minutes before calling on an engineer consultant in another clan. Jill relays the problem to him, and his disembodied voice explains several possible diagnosis and solutions as the model of "Number three"'s guts rotate and disassemble above her, manipulated by the engineers unseen hands. Schematics glow neon colors and float around the room, superimposing themselves on the opaque image of the drive train as the disembodied voice continues. Pete interjects occasionally with questions. Finally, satisfied with a given solution, Jill thanks the engineer, credits him for the service, and leaves him. Hundreds of kilometers away, buried likewise in the same Martian crust, the engineer turns back to his original work a slightly richer man.

"Got it, Pete?" Jill asks after repeating her consultant's instructions. "Number Three"'s self-repair system will have to discard certain major parts and grow new ones. The transport will be offline for a while, sitting cold on the Martian surface thousands of kilometers away while other robots work at the mine site. Jill is allowing that. "Who is operating 'three' anyway?" she asks matter-of-factly.

"No one but itself," Pete answers.

"Umphh," she answers, burying her body further into thick sheets.

"I thought you left already. Go away."

"You're still going to sponsor me, right? I haven't upset you too much?"

"Yeah, yeah," Jill mutters. Her voice is muffled by a pillow.

"You'll be voting and shit in no time. Now go away. I got hydrofarm duty in three hours."

"Goodbye," says Pete softly. His presence dissipates..

Time Line

1997 Hong Kong returns to Chinese rule; the U.S. envoy to the United Nations declares the event "momentous in the final collapse of imperialism." In Africa a previously undiscovered disease spreads to epidemic proportions. An estimated 840,000 die before the United Nations relief coalition can arrive. Civil wars continue to rage on in underdeveloped nations.

2000 By December, approximately 53,000 people worldwide die in mass millennium cult uprisings and suicides.

2008 The worldwide transition from copper wire to the fiber optic digital network is completed. A communications protocol is developed that connects television cable services to traditional long-distance providers. The new network is optimistically termed the "Global Village."

2009-2011 Massive greenhouse-induced flooding in low-altitude areas of Indonesia and China claim 4.4 million lives. The U.N. relief effort is underfunded, even with large support from Germany and Japan. The United States federal government passes a series of legislations to support non-profit disaster relief organizations in the struggle against present and future ecological threats to humanity.

2021 Biomedical engineering becomes a viable option in medical practice. The arrival of the first true protein-synthesized nanofactories is anticipated within the next decade.

2024 The phrase "heavy weather" is popularized by the global news media. Heavy weather in the form of tornado fronts, hurricanes, and typhoons had become increasing familiar atmospheric events since the turn of the century. The "Doomsday Weathermen," a minority of radical meteorologists and mathematicians, create a media scare by predicting an apocalyptic "cleansing of the Earth" by heavy weather systems.

2028 The Asian space consortium begins to seriously consider a human expedition to Mars to mine resources needed to de-industrialize. The first probes are launched in the summer of that year as the beginning to a 3-year project. The consortium's efforts are supported by several transnational corporations.

2029 Heavy weather continues to cause death and destruction. It is considered a "dire threat to civilization" and, in a massive media campaign, blame is heaped on the late 20th century "Generation X"

2035 An unexpected collaboration between eight nations results in the launching of an orbital platform construction project. The primary goal of this endeavor is to facilitate further exploration and colonization of Mars in concert with the Asian consortium. The project also provides the global media public with its first glimpse of advanced material engineering through the application of nanotechnology. Rumors immediately infect the global net that the maturing technology has already been used for decades to control population through designer viruses.

2038 The first commercial nanosystems come on-line. The Tippy movement issues a statement from the void: "humans will adapt or die." By the end of the decade the dedicated Tippy following numbers close to 9,000. Experiments and projects conducted in illegal laboratories are first publicized following a worldwide crackdown.

2040

The orbital station "Gateway" is completed in the spring. By the end of the year, increasingly ambitious exploration plans for Mars and the asteroid belt are proposed by national space agencies and private organizations.

2046

The Asian coalition forms the first tentative colony on Mars.

2047 Attacks on Tippy residences and black market clinics escalate as the ideology of accelerated human evolution spreads. A cult image of the Tippy movement is fostered; many parallel the subculture's enthusiasm to the fanaticism of the turn-of-the century millennium cults. In defense, the "Mars Century," is proclaimed by ambitious movement leaders, and funds begin to pour into the subculture as it looks for a new home.

2051 The Xanadu hypernet comes online worldwide.

2058 The first Tippy nonhuman expedition launches into space for the planet Mars. It lands in the northern Valles Marineris region, previously surveyed by the Asian expedition. 61% of the personnel responsible for this operation have Asian Space Consortium experience. Survey and preconstruction begins with prototype assembler technologies.

2059 The automated supply ship "Dallas" is launched. It reaches Mars as the first group of settlers set off from Gateway to the New World. Construction and surveying of the Valles Marineris continues under limited colonist supervision.

2061

The first sporadic communiques from the Tippy settlement reach a battered earth: "The water's fine"

2061-2130 Eighteen separate Tippy expeditions are launched. Failures on all levels decrease the population on Mars. However, the suffering endured by the earlier colonies educates and hardens later societies. The clan structure becomes adopted by 2073. The first city-commune is contracted in 2079. In 2125, the label "Maverick" is popularized by other Martian settlements to describe the post-Tippy communities of the Valles Marineris.

FOOTNOTES

1. The study and development of interface technologies grew out of the late 20th century fields of ergonomics and virtual reality.

2. The first reliable material construction systems, produced for commercial use, appeared in 2038. Assemblers and nanoscopic biofactories used in medical applications became available to physicians in 2042.

3. In 2071, Clan Ordos claimed that one of its neural networks had reached a point of maturation—it was aware of its non-being in virtual space and time, and could perceive things in its environment with a high level of reflection. This network became known as Paradise. In 2083, it fissioned into two mature entities. A further separation occurred in 2102, producing the basis of my own code architecture.

4. A typical family cell within the Smol clan is made up of six to eight individuals (human and nonhuman). In makeup of these

families, approximately 12% percent of these cells "raise" only their own biological offspring, 81% raise a mixture of adopted and biological immature individuals, and the remaining 7% do not have any immature individuals. The distinction between biological and adopted individuals is very seldom recognized in Clan Smol.

5. The minimum number of family cells in a clan is, obviously, one. The typical number at present time is approximately eighty or ninety. In order for a completely new clan to be established, it must be recognized by vote of consensus within a city-commune.

6. Special or luxury foods are produced at the family level; for instance Janice Eno grows engineered peppers for her own family and for limited trade.

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