



Designer's Notes: Transhuman Space: Fifth Wave

by Jon F. Zeigler

One of my avocations is that of futurist -- in fact, until recently I was a card-carrying member of the [World Future Society](#), which claims such luminaries as Arthur C. Clarke, John Naisbitt, and Alvin and Heidi Toffler among its membership. Professional futurists make a business out of predicting future economic and social trends. While I'm no professional, I did try to apply some futurist techniques to the design of Fifth Wave, and by extension to the design of Transhuman Space as a whole.

Present at the Creation

In January 2000 I was working on completing *GURPS Traveller: Rim of Fire*. I was also working on a futuristic hard-SF setting of my own. The "Prometheus Unbound" setting included aliens and faster-than-light travel, but otherwise it would have incorporated many of the conventions of post-cyberpunk, transhumanist science fiction. The "current date" for Prometheus Unbound was going to be about 2150.

Prometheus Unbound never got anywhere (although I may go back to it someday). On March 1, 2000, David Pulver dropped me a note describing *Transhuman Space* in very broad terms, and asking if I was interested in contributing. Naturally, I jumped at the chance to work with David on such an ambitious project -- not least because the resemblance to the Prometheus Unbound setting was very strong and I realized much of my work would be immediately applicable. While I worked on the *Rim of Fire* playtest and final draft, David and I discussed which book in the proposed series I would work on. At the time, the line plan included two books with working titles of "Earth Plus" and "Earth Minus," which would cover the prosperous and poor sections of Earth-bound civilization respectively. I chose the "Earth Plus" concept to work on, suggesting the title *Fifth Wave* as a reference to the theories of Alvin Toffler. Although I would not turn in a proposal for the book until *Rim of Fire* was in print, I was involved in the development of *Transhuman Space* from that point on.

Building the Earth

March and April 2000 was the time when David, Sean Punch, Gene Seabolt, and I worked out much of the social and political background of the setting.

My main contribution was in developing the geopolitical situation that appears in the books. I wanted the world situation to be very complex, with no one nation able to dominate global affairs. This suggested a system of Great Powers which could exist in rough balance. China, the European Union, and the United States were obvious from the beginning. Since I wanted to

make sure the setting was both cosmopolitan and surprising to the audience, I suggested making China the world's leading military power and the E.U. the world's leaders in technology, placing the U.S. in an unequivocal third place in world affairs.

At this point, I began building a model for world population and economic growth. I wanted to have a consistent notion of how many people were living in which nations, and how prosperous they were likely to be.

The first piece of this analysis required making projections for world population as of 2100. The best sources I found for this kind of information were the [U.S. Census Bureau](#) and the [United Nations Population Information Network](#). The UN website was particularly useful, as it included low, middle, and high-range projections for world population -- as well as for the population of specific nations and regions. I began by building a Quattro Pro spreadsheet and importing the name and population data for every region covered by the UN data. The data only extended as far as 2050 for individual regions, but it was easy to create a mathematical model which projected the rate of population growth for each region into the 2050-2100 period. The result ignored much of the demographic detail that real economists use, but it did give me a projected world population of about 11 billion in 2100, very close to the actual UN "middle range" projection for that year. While the final population figures I decided to use are probably not accurate, they are certainly plausible.

Once I knew how many people lived in each country, I wanted to know how well they were living. This was a trickier exercise -- predicting population growth is much easier than predicting the details of economic cycles.

I decided to start with each nation or region's Gross Domestic Product for 1999, and then assign an average sustained rate of GDP growth for each. These growth rates would be assigned more or less arbitrarily, but as far as possible they would also be in line with historical rates of growth.

I also decided to use the expected growth in productivity implied by the **GURPS** rules for advances in Tech Level. I observed that the United States in 1999, which could be considered a "mature" TL7 economy, had a per-capita GDP of about \$30,000. After some discussions with David and Sean Punch, I decided to peg the overall growth in productivity per TL at about 250%. This implied that the leading nations in 2100, with mature TL9 economies, would have average per-capita GDP of about \$187,500. This boiled down to a sustained annual growth rate for the global economy of about 1.85%, well within reason given historical trends (and given the assumption that a number of radical new technologies are going to appear in the course of the century).

Data for the 1999 GDP of each country or region came from the [CIA World Factbook](#), a resource I recommend very highly. From that starting point I assigned sustained growth rates to each country, ranging from about 1.5% up to about 5% per year. The lower rates went to nations which were either unlikely to get their economic act together, or which were already wealthy in 1999 and so had "mature" economies. The higher rates went to developing countries which seemed most likely to remain stable and could benefit from emerging biotechnology. All of these assignments were somewhat arbitrary, driven either by my educated impression of local situations, or by the demands of dramatic convenience.

All of this went into my growing spreadsheet. The results helped me see what other Great Powers might exist in the world. India was something of a surprise, coming out at the top of the population list and near the top in GDP. Minimal tweaking gave me the results I wanted regarding China, Europe, and the United States -- China with the largest single GDP, Europe

with the highest per-capita GDPs among its members, and the United States slightly behind the overall European GDP.

Inventing Ideologies

To extend the Great Power notion, I wanted at least two more Great Powers . . . but it wasn't obvious which nations should have this position.

For inspiration, I went back to the vignettes in *GURPS Bio-Tech*, which David had admitted were drawn from early concepts for the *Transhuman Space* setting. Some of the vignettes mentioned a "Transpacific Socialist Alliance" and a "Pacific War," which David confirmed were part of the *Transhuman Space* back story. David had also mentioned a political ideology called "nanosocialism," which had something to do with the TSA, but had not been thoroughly developed.

When in doubt, I like to reason from historical analogies. I had already noticed that 2100 fell at a point on the generational cycle similar to the early 1930s, suggesting a period of impending crisis. This in turn suggested a correspondence between the TSA and the Soviet Union, an empire based on unique ideology. Soon I decided that nanosocialism would be an explicit analog of Marxism. Naturally the details had to be different, but I realized that nanosocialism could exist as the same kind of revolutionary ideology. Marx had developed his ideology as a critique of 19th Century industrial capitalism, especially its adversarial relationship between Capital and Labor. I needed to invent nanosocialism as a critique of early 21st Century capitalism -- but what kind of critique?

At the time, I was reading articles in the news about genetically engineered seeds produced by Monsanto Corporation. Monsanto had designed the seeds for crop plants that would be naturally resistant to the company's Roundup defoliant. Monsanto had patented the genetic sequences in its seeds, regarded them as similar to software, and was willing to use patent-infringement lawsuits against farmers who obtained the seeds without paying for them. The company had also engineered some seeds to produce sterile crop plants -- thus requiring farmers to buy new seeds from Monsanto every year.

I was also reading articles about the availability of AIDS treatments. The parts of the world most devastated by AIDS are also among the poorest countries, especially in Africa and Southeast Asia. The drugs used in the most effective treatments for AIDS are quite expensive, and are patented by companies who (at the time) were resisting the production of cheaper "generic" versions. This struck me as another example of the same conflict between individuals and large patent-holding corporations, with the added complication that the patents on AIDS drugs could be held responsible for tremendous suffering in some of the world's poorest nations.

Meanwhile, in my "day job" I'm a computer professional. I was closely following the legal action that was already proceeding against Microsoft Corporation, for its alleged violations of anti-trust law and anti-competitive practices. I was already familiar with Microsoft's practice of concealing the "source code" for its products, and guarding those products with a dense hedge of licensing agreements and aggressive copy-protection.

Suddenly, considering all these items together, I had my critique. According to Marxist ideology, Capital held onto its privileged position because it owned "the means of production," the heavy machinery and manufacturing plants that made industrial civilization possible. In the coming information age, Capital would try to hold onto its privileged position by maintaining ownership

of the new means of production: ideas.

I postulated a world in which large corporations used every political and technological method possible to keep ideas from being copied at will. Source code for software, "content" for the Internet, genetic sequences, nanotechnological designs, all would be strictly protected. Laws would come down heavily on those who used such information without paying the owner of the patents or copyrights. Against this trend, the natural means of rebellion would involve data piracy, the breaking of copy-protection technology, gene-hacking, and reverse engineering. Revolutionaries would try to distribute the benefits of new technology freely to the world's people, without regard for the profits of large patent-owning corporations.

I decided that "infosocialism" would be about the seizure of intellectual property, by revolutionaries or by the state. In a mature infosocialist society, the government would seize such information, award royalty payments to its creators, and then distribute it on whatever basis seemed most useful. Naturally, infosocialist nations would be at odds with traditionally capitalist states and large corporations worldwide -- which would allow for lots of conflict in the setting. I submitted the results for consideration by the others. David and Sean Punch were immediately enthusiastic about the idea, and it quickly became an integral part of the *Transhuman Space* setting.

To be honest, the invention of infosocialism is the element of *Transhuman Space* in which I take the most pride, as a futurist and as a writer.

Since April 2000, we have seen the increasing application of the Digital Millennium Copyright Act to attack both "hackers" and legitimate computer security researchers. We've seen extended legislation proposed in both the United States and Europe, which may in the future require aggressive copy-protection technology in every digital device and every piece of Internet content. We've seen the destruction of the file-sharing service Napster through litigation. We've seen Microsoft Corporation mount an assertive public-relations campaign against alternative products which incorporate "open source" programming methods. We've also seen nations in the developing world turn to that same "open source" code for their own internal development. The modern world does seem to be heading quite rapidly in the direction that would lead to the development of an infosocialist critique.

Meanwhile, the *Transhuman Space* fan community has come to include sympathizers for the TSA and nanosocialist ideology, as well as for the conventional capitalist system that drives most of the world of 2100. The fact that players have actually been driven to understand and take sides in this fictional conflict shows that we've managed something very special: relevant social commentary that actually adds value to the game.

Final Assembly

In any case, with the identity and ideology of the Transpacific Socialist Alliance established, we needed to decide what nations were going to be its members. At first, we were thinking in terms of an alliance led by Taiwan and Australia -- Taiwan because several of the vignettes in *GURPS Biotech* suggested a Chinese component to the TSA leadership, Australia because of some of the details in David Pulver's unpublished notes. Both of those ideas became less plausible to us as time passed. David decided that he wanted Taiwan to be unified with China early on, giving that nation the political unity it would need to pursue an aggressive space program. Australia also struck us as a very unlikely place for any kind of socialist ideology to take hold.

Unfortunately, taking Taiwan out of the TSA raised other difficulties. Since we had already established that the People's Republic of China was the major combatant in the Pacific War, opposing the TSA, this made it hard to justify the TSA's ethnic-Chinese leadership. Eventually I suggested Southeast Asia as the TSA's heartland. Many of the nations of that region have substantial ethnic-Chinese minorities, allowing us to rescue the Chinese names for TSA leaders. Several of those nations are already old-style Communist states, and none of them have ever been overly fond of China itself. This suggested a Pacific War involving heavy fighting in Southeast Asia.

To get the "Transpacific" part of the TSA, I suggested adding some of the Andean nations of South America -- Bolivia, Columbia, and Peru. It was not hard to justify the presence of these nations in the infosocialist bloc, especially given the "Andes War" which David had also mentioned in *GURPS Bio-Tech* vignettes. The Andes War also fit into another detail I had suggested for the setting: the U.S. involvement in Ecuador, following the construction of a major spaceport near Quito. (This last detail was actually a tribute to the late Poul Anderson, who used a similar idea in several of his novels.)

Eventually, we arrived at the list of TSA members that still stands in the finished setting. That left us with a few nations lacking any obvious allegiance. The Pacific Rim Alliance made sense as a counterweight to both China and the TSA, and had the useful effect of giving us a three-way "cold war" in the western Pacific region. The Islamic Caliphate was probably the least plausible notion, but it had the virtue of giving the Arab world some back story that didn't involve a brute projection of current politics. The South African Coalition was the result of the most plausible way we could think of to get a "renaissance" in sub-Saharan Africa.

By the end of April 2000, the broad outlines were finished. Much of what's now Chapters 1-3 of *Fifth Wave* was written in the summer of 2000, and later edited as parts of it were subsumed into the *Transhuman Space* core book.

Viruses of the Mind

One idea which we agreed from the beginning to include in the setting was that of memetics. Memes are a common idea in transhumanist literature, and they appear in a great deal of recent science fiction. The *Transhuman Space* core book includes an extensive discussion of memes and memetics, including rules for the Memetics skill on p. TS137.

The following extended rules for Memetics should certainly not be considered official, but they are something that I would have included in *Fifth Wave*, had I developed them early enough for a playtest.

In general, if a memeticist is interacting directly with a given individual, he does not need to make Memetics skill rolls. The "edge" that Memetics gives in such situations is reflected in the bonus to other skills (see p. TS137). Rolls against Memetics are normally used in situations where the memeticist is analyzing the behavior of an individual or group at a distance, or if he is attempting to advise others.

Any task involving a roll against Memetics usually requires about 10 minutes. Very complex analyses may take much longer (especially those involving Memetic Design).

Consultation: A memeticist may roll against his skill to study an individual or group and then advise someone else on how best to approach the subject of his analysis. In effect, the memeticist

can "loan" his Memetics bonus to someone else. The loan is only effective for a single task.

Meme Analysis: On a Memetics roll, a memeticist can examine any text (or visual presentation) and determine what memes are present in it, as well as the degree to which those memes were deliberately placed. If the memeticist succeeds by 4 or more, he will be able to gather some information about the "ancestry" of the memes -- what memes are related, to what degree the memes were deliberately designed, and so on.

Memetic Design: This powerful application of Memetics allows the memeticist to design specific memes for a target audience. The memeticist must already be very familiar with the profile and past behavior of the target group (previous rolls against Memetics, Psychology or Research are appropriate here). The skill roll is modified by the number of people in the target audience, by the time taken for construction of the memes, and by the complexity of the memes, according to the following tables:

Size of Target Audience Modifiers

Size	Modifier
Up to 100	-2
101-1,000	-4
1,001-10,000	-6
10,001-100,000	-8
Additional factor of 10 -2 extra	

Time Taken Modifiers

Time Taken	Modifier
1 hour	+1
2 hours	+2
4 hours	+4
8 hours	+6
1 day	+8
2 days	+10
4 days	+11
1 week	+12
2 weeks	+13
1 months	+14
2 months	+15
3 months	+16
6 months	+17
1 year or more	+18

Complexity Modifiers

Complexity	Modifier
Simple ("Drink AgriCola," "Vote for Smith")	+0
Medium ("Support bioroid emancipation")	-4
Complex (Complete religion or philosophy, with details)	-12

After the memeticist takes the requisite amount of time, the GM should roll in secret against his Memetics skill. This roll only reflects the design of the requisite memes. The memeticist (or his partners) must still deliver them in the content of a verbal or visual presentation. This requires access to communication channels used by the target audience, and usually costs about \$0.05 per member (doubled for Medium memes, multiplied by 10 for Complex memes). At the GM's discretion, he may require rolls against Photography, Video Production, Writing, or similar skills. If the target audience is multilingual, the memeticist or his partners must construct material in all of the languages involved -- while real-time translation is possible, it sometimes misses nuances. This adds nothing to the final cost, but requires that the memeticist or his partners be fluent in all the target languages.

Once the memes are delivered, the target audience will absorb them and either accept or reject them. Naturally, many members of the audience will simply ignore the memes or reject them out of hand. For a typical meme which doesn't go against "conventional wisdom," about 1% of the audience will accept the meme for every point of success in the Memetics roll. Memes which are radically unusual or which encourage self-destructive behavior may have acceptance rates much lower than this. Any member of the target audience who accepts the memes will shift his behavior in accordance with the memes, acting as if the ideas were his own. The memeticist will not get to choose which members of the target audience accept his memes -- this is a matter of random chance. Note that audience members who do not accept the memes may still notice them, especially if they have Memetics skill of their own.

Successful memes often spread beyond their target audience. If a memeticist gets a critical success on his Memetics roll, the GM may assume that people outside the target audience have begun to accept and pass on the meme. Alternatively, on a critical success the memeticist can deliver his memes for only a fraction of the money, starting a "fad" that is mostly financed by the memes' earliest adherents.

On a critical failure, the memes will have an undesired effect. Perhaps some portion of the audience will accept them, but they will encourage behavior contrary to the designer's goals. Or perhaps the unaffected portion of the audience will notice the memes and begin acting against them. If the memes were delivered across the web, a critical failure may even indicate the formation of a Free Meme (p. FW32).

Memetic design is an accepted part of Fifth Wave civilization, and has its roots in the "advertising industry" of the 20th century. Some democratic states regulate only the most dangerous memes, those which directly promote violence or the overthrow of the state. Many nations are far more restrictive, and define the design or release of forbidden memes as a "memetic crime."

Example #1: Lim Chaing Lai (p. FW107) is designing memes to incorporate into a speech that one of his lieutenants is to give to an audience of 10,000 people. He has Memetics-16. The Size of Target Audience modifier is -6. Mr. Lim has a whole week to prepare the memes, so his Time Taken modifier is +12. The ideas he wants to convey are quite complex, and will set off elaborate chains of behavior if they are accepted, so the Complexity modifier is -12. Mr. Lim's total modifier is -6, and the cost of preparing the presentation is about \$5,000. He rolls a 7 against his Memetics skill, succeeding by 3. About 3% of the target audience (or 300 people) will accept the memes and change their behavior as a result.

Example #2: Alisa binti Kasan (p. TS105) wants to engineer a "suicide cult" as a combination prank and protest. She has Memetics-18 and (through her extremely wealthy family) access to a great deal of money. She targets the population of several U.S. states (about 50 million people),

for a Size of Target Audience modifier of -14. She takes an entire year to research and design the memes for the Blood of the Lamb cult (Time Taken modifier of +18). The memes themselves are Medium, since they involve much less detail than a fully-developed religion (-4). Her total modifier is +0, and the cost of delivering the memes is about \$5 million. At the end of the year of work, she rolls a 12, succeeding by 6. For an ordinary meme, this would mean that about 6% of the target audience were "converted" (or about 3 million people). The GM rules, however, that the Blood of the Lamb memes are both unusual and encouraging of self-destructive behavior, so he reduces the acceptance rate to about 1 in 1,000. About 3,000 people accept the memes to the extent of joining the cult and eventually committing suicide. Alisa soon goes into hiding as a wanted criminal.

Article publication date: June 7, 2002

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