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PEACE FROM ON HIGH

By Joe Haldeman

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We go to war ostensibly as a last resort in political and economic problems, or out of religious or racial passions - or sometimes for patently indefensible reasons: to provide excitement for a class of people, or to try out new military techniques, or even, at least once, over anger at the outcome of a ballgame. People can argue endlessly over the justifiability of going to war for this or that reason; we want to examine our motivations more deeply.

Is there something in human nature that makes warfare "natural"? If we understood the part of our human-ness that makes us go to war, would it be possible to sidetrack it?

Konrad Lorenz, in his convincing book *On Aggression*, developed a logical argument explaining the evolution of organized warfare. Briefly summarized, it goes as follows:

Lethally-equipped carnivores, in particular, have strong inhibitions against "seriously" attacking one another. At most, they engage in ritualized combat behavior that determines which individual is stronger, conducted in such a way that the weaker individual is not seriously harmed (generally, the winner goes on to mate; the loser either sulks or seeks out another combat).

Human beings, lacking great strength or sharp teeth and claws, evolved without these inhibitions. But when we became tool-users, we were suddenly the most deadly species on the planet.

At the same time, though, we were social animals. Lorenz attributes the generalization of murder into war to processes he calls "pseudo-speciation" and "militant enthusiasm."

Pseudo-speciation describes the way we divide ourselves into various discrete groups by copying the behavior of those around us. Eventually, the groups may become quite incompatible. The divergence of languages is an obvious example, but less fundamental activities such as posture and habits of grooming, diet, and so on, also separate us from neighboring groups - and very often the degree of difference has little to do with the degree of estrangement.

Militant enthusiasm is a state of mind, of being, that dominates many individuals for several years during and after adolescence: the need to identify strongly with a cause, with a tightly-knit group fighting for a common purpose. Unfortunately, the cause espoused may be trivial or even pathological - for every dedicated young Peace Corps volunteer there are equally dedicated surfers and Hell's Angels. When militant enthusiasm fixates on political ideals, the results may be particularly ugly, with the-end-justifies-the-means vindicating assassination, sabotage, random terrorism.

In a more everyday sense, though, it is a combination of militant enthusiasm and pseudo-speciation that provides the world's armies with their fodder. This observation applies to conscription as well as recruitment. Most conscripts become willing enough soldiers, their traditional grumbling to the contrary, in spite of the obvious fact that

they have no more personal freedom or identity than an imprisoned criminal, and less chance of surviving the experience.

I can speak with some authority about this. I was drafted in 1967 and wound up fighting in the Central Highlands of Vietnam, in a combat unit where at least nine out of ten soldiers were also draftees. No one under the rank of captain had any political sympathy for the war; none was planning to spend one more second in the Army than the law required. Yet we were a fairly efficient outfit, as reflected in the cold language of kill ratios and in the bright bits of ribbon armies like to pass around. Why?

The role of militant enthusiasm is fairly obvious, since most of the boys were not yet twenty. Pseudo-speciation enters at two levels, neither of which, I think, was the result of conscious effort on the part of the military.

As old as war itself must be the process of teaching new soldiers that the enemy is not really human. He is given a dehumanizing name - gook, kink, jap, kraut - and becomes the second most popular topic of conversation. Soldiers constantly trade stories about his ferocity, his alien behavior, the (inhuman) atrocities he commits, all with the goal of reinforcing an unspoken argument: It's a sin to kill a human; the gook is not a human; therefore it's not a sin to kill a gook. Logicians and vegetarians will see the illogic of this scrambled syllogism, but most soldiers embrace it subconsciously, never examining it. (The enemy were similarly taught. When we took prisoners they were usually terror-stricken in expectation of the treatment we were going to give them; many committed suicide rather than be captured.)

Another level of pseudo-speciation, which merges with militant enthusiasm, was the understanding that the main reason for fighting was to protect your comrades - your squad, platoon, company in roughly descending order. I'm sure this is a strong motive for any soldier, but it was of prime importance in motivating a fighting force that was not driven by patriotism; that knew little and cared less about the political justification for the war.

This digression isn't meant to demonstrate that Lorenz's two mechanisms are evil, no more than the sexual impulse is "wrong" because it often leads to unhappiness. In fact, Lorenz argues that pseudo-speciation is the root source of all lawful and even moral behavior, since we all initially conform to what we've been taught is right, and later adjust according to our individual perceptions of rightness. And it can't be denied that militant enthusiasm often fuels worthwhile goals.

How can we adapt our understanding of these two forces to model a future without war? I think a useful jumping-off place is to look at science fiction, where both have been treated implicitly, often enough to generate cliches.

Especially beloved of B-movie and television writers is the future where pseudo-speciation has been effectively side-stepped, by postulating an Earth (or other planet) where only one single culture exists. It's not

difficult to imagine a progressive sophistication of techniques in the social sciences and education, such as is assumed in Orwell's 1984, that might eventually make it possible for such a future to be imposed on an unwitting, perhaps unwilling, population. It's even possible that in the natural course of things, one way of life will prove so demonstrably superior that all cultures will eventually embrace it.

But these "One World" utopias don't really solve the problem. They might well be without war, if the required conditioning were efficient enough to guarantee absolute cultural solidarity, but they would also result in a humanity less than human: static, stagnant. It's true that world peace would require some sort of world-wide peace-keeping authority. But there is no reason to presuppose that it would be necessary for us to sacrifice our individual and group diversity to it.

Another science-fictional approach to this is the notion of actual speciation - that is, of changing Homo sapiens into some "Homo superior," who of course would be above war. A few years ago it would have been reasonable to dismiss this as simple fantasy. Today, it's not too far-fetched to extrapolate from recombinant DNA research to eventual genetic engineering of higher animals and, finally, humans. But even if the idea didn't have truly Frankensteinian implications, we'd still have to reject it as a useful line of investigation. There are too many procedural questions that can't yet be answered: Can techniques that have worked to alter the metabolism of simple organisms be applied to subtle changes in the far more complex genetic structure of human personality? Could a socially undesirable trait be eliminated without affecting desirable traits? (Love and friendship, Lorenz claims, are derived from instinctive behavior patterns related to aggression.)

Science fiction's approach to militant enthusiasm is more interesting. It usually postulates a more-or-less dramatic application of what Lorenz calls "redirected activity" - pounding your fist on the table instead of on someone's chin, for instance. In science fiction the redirection is usually accomplished through some surrogate institution that takes the place of war.

Several authors have used a future where warfare is not completely eliminated, but instead is ritualized into a relatively harmless activity. Mack Reynolds, for instance, had multinational corporations settling their differences with teams of mercenary soldiers who slugged it out with primitive weapons on special reservations - for the entertainment of a population that was otherwise quite placid. Variations on this theme do have some anthropological justification, namely, the mock combat of certain primitive tribes. But even if they did describe a desirable future, it's difficult to see how we would get there from here; and limited or stylized warfare is still war.

A more generally acceptable surrogate, one that for a time became an unspoken axiom behind most science fiction stories, was that of space exploration itself. Writers used a sort of revisionist Turner Thesis logic: that the passions driving mankind to war might instead be applied to exploring and exploiting the endless frontier of space.

This assertion would be hopelessly Pollyannish if the only support for it were analogy to American history. Expansion into the West was supported by a brutal, shameful war. And the period of America's greatest involvement with space exploration quite closely paralleled the duration of the Vietnam war. Analogy's a tricky and limited tool, though, and I think a good case can be made for this idea by applying Lorenz's insights on aggression to current thinking about space industrialization in the near future.

Most of this magazine's readers must be familiar with the O'Neill Plan; I will present only a broad outline of it:

Princeton physicist Gerard O'Neill begins with the premise that there can be no stable world order until all the world's people are reasonably prosperous - at least provided with adequate food and shelter - and that the key to this prosperity is an abundance of energy. If this energy were to come from conventional sources, though, there would be dire environmental and political consequences.

O'Neill proposes that the energy come from space. Solar power satellites (SPS's) would generate electricity in orbit and transmit it to Earth via microwaves or infrared laser. The SPS is far superior to a ground-based solar energy plant because it runs 24 hours a day, isn't bothered by weather or the attenuation of sunlight by the atmosphere, and doesn't take up large areas of potentially useful land.

The largest problem with this is money, and by far the most expensive part of it is getting into orbit the materials for building the SPS's. Just one of them would weigh about 50,000 tons - more than a thousand shuttle flights, at \$30 million a trip, which means an Apollo-sized price tag just to get the material into low Earth orbit. And the plan calls for dozens of generators, in high orbit.

What O'Neill suggests is that we don't have to orbit raw materials. Instead, we put into orbit processing plants capable of using raw materials that are already up there, mining the Moon or an asteroid. This could provide a tenfold saving in the cost of the first SPS, with even more dramatic savings for subsequent ones, since the factories would already be set up.

At the heart of O'Neill's plan is that the exploitation of space could soon take off on its own, becoming independent of Earth. The labor force that built the first SPS's, some thousands of people, would live inside a large structure that held an Earthlike environment. While they built power satellites, they would also be building more factories and habitats. By the time there were enough SPS's to satisfy the Earth's power needs there could be a stable and growing community of these orbital settlements - another country, in a sense, but in important ways quite different from any community that has ever existed on Earth.

Suppose O'Neill's first premise is wrong, and abundant energy from space does not lead to general prosperity or (as we must admit is possible) there is prosperity but it does not lead to peace. Then this space

community, originally a side effect of the SPS project, takes on new significance.

The apocalyptic scenario of thermonuclear or biochemical war destroying all human life on Earth is simplistic, but there is a remote chance that it could happen. An all-out high technology world war also could precipitate runaway ecological changes that could make the Earth uninhabitable. In this case the value of the space community would be obvious, a sort of lifeboat for our species.

But we don't have to invoke Armageddon to demonstrate the usefulness of O'Neill's ideas. There's a less dramatic, more interesting argument to be made.

The central political fact of the late twentieth century is the cruel arithmetic of an exponentially increasing population dependent on finite resources, unevenly distributed. Ten thousand people die every day of starvation or nutrition-related disease, but thirty times that number are born each day. The cultures that suffer the most from starvation also tend to have the highest birth rates, which is negative pseudo-speciation with a vengeance. The United Nations predicts that it will take about a century for deaths to equal births, with population stabilizing at around twelve billion.

The most humane model of life on Earth consistent with this future requires that we somehow triple our production of food, and distribute it fairly enough that all twelve billion can subsist - and then somehow reduce the birth rate so that the population can remain stable without benefit of famine. Unfortunately, it seems more likely that we will conform to the pattern observed in overcrowded animal populations: a relatively sudden reduction in number, to a population that can be served by the available resources. In our case, the reduction would probably involve warfare.

No responsible person would deny the link between the population explosion and the danger of war. O'Neill doesn't suggest that "space humanization" would make a dent in the population directly, but he does observe that a culture's birth rate will invariably go down as its prosperity increases. This prosperity is normally gained at the expense of another culture, through commerce or war, but that wouldn't be so if it were the result of energy from space.

This, then, is a short-term benefit of space humanization - a potential avenue for economic growth from resources that come from outside of the existing global economic system; wealth that a country can use without depriving another country of wealth. But there may be a long-term benefit on a vastly larger scale.

There are two probable patterns for the future population of the Earth: either a crowded steady-state situation, where population control has succeeded, or an oscillating pattern, where a period of increase is followed by catastrophic decline through war, famine, or disease; then subsequent alternations of increase and decline. Right now, the second pattern seems the more likely.

Real estate brokers justify land as an investment with the observation "They aren't making any more of it"; this homily is trivially the final argument for population control and the reason behind most war. But the space settlements described by O'Neill do make new land; furthermore, the amount of land can increase geometrically, since each new settlement is in the business of making other new settlements.

It may seem absurd to consider the interior of an orbiting vessel to be "land," since if we think of space habitats at all, it's in terms of cramped laboratory environments like Skylab and Soyuz. But O'Neill's settlements aren't made of mass that has to be lifted from Earth - the vehicle that put Skylab up weighed nearly 40 times as much as the habitat - and the energy for moving the mass can come from free sunlight. So these habitats can be quite large and relatively roomy. O'Neill suggests as a basic structure a sphere nearly a mile in circumference (diameter 460 meters), which could house 10,000 workers in a space no more crowded than a small town. The living conditions inside would be comfortable, parkland alternating with housing, offices, and shops. The satellite would rotate to provide normal gravity, and would have a retinue of agricultural modules to supply fresh food.

Half of the workers would be employed building SPS's; the other half building new habitats. O'Neill estimates that it would take seven years for such a work force to build a habitat... and from that point the space community could grow with the speed of a yeast culture: in 14 years there would be four habitats; in 21 years, eight. In less than fifty years there could be a hundred habitats, room for a million people. In fact, the growth rate might be even faster, since at some point the market for SPS energy would be saturated, freeing the entire work force for habitat construction. (Actually, the habitats wouldn't be rubber-stamp duplicates of the first one. Designs would improve with experience, and it seems likely that very large ones would be built eventually. O'Neill describes an "Island Three" that is large enough to accommodate the entire population of New York City.)

Where does all of this lead? If these settlements are to be nothing more than dozens or hundreds of new little countries, separated by vacuum rather than lines on a map, then we've done nothing but export our problems, expanding the scope of warfare in interesting ways. I think it will be profoundly otherwise.

The people who live inside these worlds will not leave militant enthusiasm and pseudo-speciation behind them. They will get fired up over "causes" and they will perceive humanity in terms of us-and-them. But *them* will be the people still living on Earth, safe beneath their blanket of air, rather than fellow space-dwellers. And this alienation, no matter how deeply it might eventually be felt, would not manifest itself as war between the space settlements and Earth - it would be a very short war, since a massive satellite is an unmaneuverable sitting duck.

The militant enthusiasm of space dwellers would have to find other outlets. As science fiction writers have predicted, space exploration

would be one of them. Space travel would be a much simpler proposition than it is to us, who have to struggle out of Earth's gravity well. After a couple of generations' progress, individuals or businesses or families might even cobble together their own spaceships: thumb their nose at the old fogies and set sail for the Asteroid Belt.

But there are more ways of "getting away" than simply leaving, and this may ultimately be the most important effect of space humanization. Space settlements will reject many of the details and some of the axioms of the political systems they leave behind on Earth. They will experiment with new patterns of social organization, and some of their experiments will bear fruit.

In the mid-18th Century, the population of the British colonies in America numbered barely two million people. Out of that small group came such men as Washington, Jefferson, Franklin, Henry, Adams - and a political system that fired the world's imagination and permanently changed the human condition. It's fair to ask why, with a hundred times the raw material, with two hundred years of experience and reflection, we can't generate a few people of that caliber now.

At first blush this may look like nothing more than a peculiarly American slant on the old historical puzzle of whether "the times make the man" or vice versa. But it's a more general problem - the rest of the world isn't enjoying any surplus of innovative statesmen - and it provides some insight into the possible social utility of space humanization.

The American constitution was written under circumstances very different from previous or subsequent documents. Unlike the bloody aftermath of the revolutions in France, Russia, and China, there was no suddenly tumbled ruling class; no profound redistribution of wealth. There was simply the need to build a workable political structure (the juryrigged Articles of Confederation having been hamstrung from the beginning) coordinating the sometimes conflicting desires of the various colonies. Most significantly, this structure could be worked out *in vacuo* - pun intended - without interference from foreign powers, from basic principles embodied in English Common Law and classical Greek notions of democracy.

There is no place on Earth where a similar environment can exist today. Modern revolutions in Latin America, Africa, Asia, and the Middle East have not resulted in fundamentally new models of social organization. I can't believe that this is because the people involved are all blind to the need for new models, or that they are manifestly inferior in social conscience or intellect to the upper-class Anglo-Saxons who drafted the American document. It's just that there is no political laboratory on this planet that is free of contaminants. No new government can function effectively without aligning itself to a superpower. And the superpowers themselves are sodden with inertia, topheavy with millions of bureaucrats whose daily survival depends on the maintenance of yesterday's forms and values.

No one can guarantee that the space settlements will provide a political *tabula rasa*. In fact, the first settlements will doubtless be heavily in debt to the organizations that provide the wherewithall to get them off

the ground - just as the colonies in America started off with debts to British, French, and Dutch concerns - and it isn't likely that this indebtedness will be free of political strings. As the number of settlements increases, though, they will be less and less dependent upon Earthbound economies; growing away much as the United States grew away from European tradition as its frontier moved west.

But the settlements' frontiers can expand almost without limit, and the expansion will be done in peace. For they will have to accept as an initial condition of life a slogan that to us is, so far, only an approximation of truth: war is suicide.

-Joe Haldeman