RODS FROM GOD

Imagine a bundle of telephone poles hurtling through space at 7,000 mph

John Arquilla
Sunday, March 12, 2006

Although the fighting in Iraq and Afghanistan often takes place at eyeball range -- as will most battles in what Defense Secretary Donald Rumsfeld now calls "the long war" -- Pentagon planners are spending billions of dollars trying to figure out how to engage our enemies on the ground with weapons based in space. Efforts are also under way to figure out how to wage war in space, not just to bombard others from the heavens.

Militarizing our world's ultimate "high ground" would violate the clear intent of the 1967 Outer Space Treaty, which was designed to keep the peace high above the planet.

[Podcast: Back Story: Rods from God]

So why is there such keen interest in taking our violent ways into orbit?

There are several rationales, mostly variants of the idea that war must inevitably migrate from Earth to space. But these arguments are seriously flawed if only because they become self-fulfilling prophecies as soon as we articulate them. If we call for a generation of space warriors, surely Chinese taikonauts and Russian cosmonauts will soon follow suit.

But the reasons for wanting to militarize space go beyond innate aggression. The most compelling rationale for putting weapons in space is the perceived need to be able to "take out" a rogue nation's deep underground facilities, where illicit nuclear weapons development might be going on.

Twenty-five years after the Israeli raid on Saddam Hussein's nuclear power plant at Osiraq, would-be proliferators have learned the lesson: They have to burrow deep for protection from such strikes. So now we live in a world with underground facilities that are invulnerable to conventional bombing.

A favored method being contemplated for hitting such "hardened, deeply buried targets," as they are called, is to develop a capacity to bombard them with "rods from God." To picture what these God rods might look like, think of a bundle of insulated metal telephone poles, dropped from an exquisitely calculated orbital location and reaching a speed of Mach 10 (over 7,000 mph) by the time they hit Earth.

The reason this idea is so attractive is that the rods would have enough kinetic power to destroy even the deepest known facilities -- many hundreds of feet beneath the Earth's surface. The other benefit is that the metal rods would constitute a simple, conventional payload, so we wouldn't be "nuking" anybody with them. Also, such bundles of metal are not specifically disallowed by the 1972 Anti-Ballistic Missile Treaty, which explicitly prohibits only deploying nuclear weapons in space. The rods, however, would violate the spirit of the more general Outer Space Treaty.

Beyond potential treaty concerns, though, there is another problem with rods from God. We could never know or be able to prove what they had struck -- unless they somehow set off a nuclear explosion in a reactor facility, and that would create another set of problems, ranging from the environmental to the effect upon world public opinion.

Even without creating an inadvertent nuclear disaster, there are other perils. The country that was hit by our rods could always claim innocence and react with outrage, further kindling anti-American feelings. We might also hit a decoy site instead of smashing the real thing, because proliferators have learned to distribute their programs rather than to concentrate them in one convenient location.

And even if rods from God did succeed, it would probably be a one-time thing, like the Israeli raid on Osiraq. Rogues would soon figure out that they now had to build their deep underground sites beneath densely populated cities instead of in remote areas, which has already been done by the Russians, who built amazing subterranean command and control facilities below Moscow during the Cold War.

Who would order a rod strike on a city? It would take either a sociopath or someone with exceptionally steely resolve to drop iron rods on an innocent civilian populace.

Some in the Pentagon are well aware of these concerns and are chastened by them. So they have come up with other options for waging war from space. The most intriguing is to build a bomber aircraft that can soar from the ground to low-Earth orbit, circle the globe in little over an hour, then dive down and strike any target, anywhere.

The beauty of this is that the plane uses space only in a "touch and go" fashion, with no weapons based in sustained orbit. An added benefit is that no overflight permissions are needed from nations along the weapon's path, because the bomber could drop down directly on the enemy from overhead in space. Of course, "getting out of Dodge" after the strike would require passage rights, unless the homeward-bound bomber has the capacity to go back into orbit.

Another variant of this idea is to use such a space plane to move commando teams anywhere in the world at lightning speed. This became a powerfully attractive idea to the U.S. military, especially following Sept. 11, 2001, when it grew clear that we needed a capacity to strike with exceptional swiftness against a nimble new enemy. The requirement for such an aircraft even made its way into a Marine Corps "needs statement" in July 2002.

The basic problem with these "orbital bomber" and "starship trooper" ideas is that they would cost trillions of dollars -- all to deliver a thimbleful of force. In addition, because they have to be big and rugged enough to get to and come down from space, neither can be stealthy. Because of the means of delivery, they wouldn't have a protective escort, either. So, once detected, they would be vulnerable to being shot down. And just sending weapons and troops into space, orbiting them about and then attacking would risk sparking an arms race in space.

The military knows about all these downsides, especially the potential for an arms race in space. Yet some generals still say, "Bring it on." They believe war in orbit is coming anyway and we should be prepared for it.

Right now, our plans are mostly defensive in nature, intended to figure out how to protect what we put up there. One example of this is the call to create "Angels" (an "autonomous nano-satellite guardian for evaluating local space"), a swarm of microscopic satellites that would warn of an approaching enemy and allow time for evasive maneuvers by our satellites.

On the offensive side, virtually all research is classified, but popular magazines often mention anti-satellite weapons of all sorts, from laser-beam-firing hunter-killers to kamikaze satellites that ram or blow themselves up near an enemy orbiter.

Ethical and legal issues aside, the difficulties with waging this kind of war in space are profound, and should keep us from pursuing such a path. The fundamental issue is that it is easier and cheaper to destroy things in space than it is to put them there and make use of them.

The cost of manufacturing each communications or monitoring satellite and putting it into orbit is at least $1 billion, while the cost of a ballistic missile capable of destroying it is about $10 million. And the debris fields created by blown-up satellites would continue to orbit the Earth, making huge swathes of space unusable for decades.

If instead the enemy simply wanted to blind our satellites, it could be done cheaply by having a few missiles detonate nuclear warheads, creating electromagnetic pulses that fry satellite information systems. During the Cold War, Red Army war games often began with a simulated electromagnetic pulse strike, blinding NATO forces facing a Soviet tank onslaught.

While the Soviet Union no longer exists, consider the 1 million North Korean troops massed on the edge of an ironically named demilitarized zone. Imagine what would happen if the outnumbered 30,000 U.S. troops and their South Korean allies were denied satellite information at the outset of an invasion.

In its outlook on space, the United States has a case of what my late Rand colleague Carl Builder called the "Icarus syndrome." The U.S. military is drawn, like Icarus, ever higher. Yet, if it became capable of waging war in space, the results would be as catastrophic as they were for Icarus when he flew too close to the sun.

Our image would be damaged. The financial waste would be enormous, as we spent huge new sums on ineffective or easily countered new weapons. Worst of all, others will fight back in space, and we would likely lose the satellite connectivity that contributes so much to the efficiency of our incomparable ground forces. In the "long war" against terror, waged against elusive enemies on the ground, losing access to space-based communications and targeting systems would be crippling.

So beware. The ultimate high ground is most perilous. It is a place where even the Pentagon's Angels should fear to tread.

John Arquilla is professor of defense analysis at the U.S. Naval Postgraduate School in Monterey. The views expressed are his own. Contact us at insight@sfchronicle.com.

http://sfgate.com/cgi-bin/article.cgi?f=/c/a/2006/03/12/INGS6HID5A1.DTL

This article appeared on page **E - 1** of the San Francisco Chronicle