

Viewpoint

Are We Running Out of Wars?

In *The Outline of History*, H.G. Wells observed that "[a] man of foresight surveying the world in the early 16th century might well have concluded that it was only a matter of a few generations before the whole world became Mongolian—and probably Moslem." By 1529 the Turks were besieging Vienna, and it was not until the battle of Lepanto in 1571 that the tide appeared to turn.

This was the world into which Galileo was born in 1564. His early attempts to understand ballistics and his successful experiments to clarify the motion of projectiles were important to a generation preoccupied with throwing back the Ottoman armies that had been steadily advancing for three long centuries, becoming the most powerful empire of its day.

We tend to think that the link tying technological advances to military demands is a 20th century development. But the correlation between war and technical prowess is far more prevalent. Throughout history, fear of subjugation by a powerful enemy has facilitated the work of scientists and inventors.

I cannot imagine anything more removed from day-to-day military concerns than astronomical studies. Nevertheless, the most profound astrophysical discoveries since World War II have involved detection techniques initially developed for military surveillance and later made available for scientific purposes. As the Western world begins to realign itself politically this year, the interdependence of war and technology should be viewed with alarm. We have come to equate technological advances with progress, and progress with our American way of life. Consequently, we must now squarely ask ourselves whether the United States' standard of living may be permitted to depend on preparations for wars—hot or cold.

From a nation that has always abhorred war, the morally imperative response to that question must be a resounding "No!" But that will not solve the practical problems of maintaining our most successful high-technology industries at a

time when relations between the United States and the Soviet Union are improving. We must recognize that traditional wars are not likely to be our main threat in the years ahead. Instead, the damage we have inflicted on the environment poses far more serious challenges and potentially catastrophic problems for us and for generations to come.

To even assess the extent of the threat we will need to study global changes on land, in our waterways and oceans, and in the atmosphere. We have some idea of what that effort will take, because a succession of increasingly sophisticated Landsat satellites has been circling the globe since 1972. With the aid of powerful computers, images capable of highlighting vegetation of different kinds can be teased from the digital data gathered by these satellites over the years. The Center for Earth and Planetary Studies at the National Air and Space Museum has been one of many laboratories throughout the United States devoted to such studies. These show the Amazon Basin now undergoing extensive deforestation, especially in Brazil, where expanding populations have each year been clearing tracts of land comparable in size to Pennsylvania. And Central Europe is losing huge expanses of forested lands to airborne deposits from the burning of widely used sulfur-containing coal.

If we want to leave our children a green and blue planet, rather than a blackened desert, we will need to learn much more from sophisticated global surveys so that we can take effective measures to reverse the damage and save our planet's ability to support life. Landsat has been a good start in that direction. It will also take a massive effort on the scale of NASA's proposed Earth Observing System followed by energetic corrective action—challenges that will fully test our resourcefulness for decades to come. No other threats are needed to keep us inventive, productive, and alert. We need not worry about running out of wars.

—Martin Harwit is the director of the National Air and Space Museum.

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