

## How Technology Promotes World Peace

Much as economic integration made the world more cooperative and less conflict-prone, so can technology. Is this Pax Technologica?

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Every era comes with a vision of global peace, usually named for the reigning hegemon of the time. Pax Romana during the Roman era, Pax Mongolica when the Mongols ruled so much of the world, Pax Britannica for many years, and Pax Americana today. None of these were particularly peaceful periods, of course. The great power enforced their dominance through, among other things, advances in military technology, which intimidated its enemies but spurred arms races and competition. The Romans had bronze weapons and artillery launched from giant catapult ballistae; the Mongols used stirrups and the composite bow to gallop across Eurasia; steam engines and rifles enabled the British military to build a global empire; and the U.S. still has an edge in nuclear weapons, aircraft carrier fleets, and long-range bombers, among other technologies.

It is little surprise, then, that some observers see historical patterns of competition playing out in China's rise today. The Asian power is behaving in some ways like a classic mercantilist empire, locking up natural resources across continents, while flooding global markets with its cheaper goods. Some of its current account surpluses have been plowed into military investments, such as a blue-water navy, space-based weapons, and cyber-security.

Since the rise of Song Dynasty China a millennium ago, you might say that there's been a hegemonic power transition somewhere in the world about once every century. That's not a scientific formula, of course, but it certainly informs speculation that China might someday surpass the U.S. on the global hierarchy. But, as the world potentially faces yet another round of national competition, there is one factor that is leading the powers, great and non-great alike, to be more cooperative and less competitive: technology. As states become more populous, urban, and interconnected, they are more reliant on technology -- medicine, agriculture, communication, and so on. Technology requires long supply chains to build and cross-border cooperation to develop, both of which are easier if states cooperate rather than compete. Even as technology evolves to suit military objectives, and is often guided by the military (the Internet began in part with U.S. Department of Defense funding), we might be about to enter a sort of Pax Technologica of global stability through, in part, technology.

It was the realization that economic power is the foundation of geopolitical security that prompted scholars in the late 1980s to speak of "geo-economics" as an alternative approach to world politics. Paul Kennedy's *Rise and Fall of the Great Powers* warned that poor economic health at home is a prime cause of "imperial overstretch" abroad. And Samuel Huntington, for example, pointed out that "economics is

the most important source of power and well-being." Since the end of World War Two and especially since the end of the Cold War, global conflict has been declining rapidly as economic integration and cooperation increases. This inter-dependence, the theory goes, promotes peace.

Geo-economics never really displaced geopolitics, a term coined about a century ago, but we do now understand the two as complementary. And as the global economy has become more integrated, states have greater interest in cooperating and less interest in conflict, which can lead to a kind of mutually assured economic destruction. There are many, many important differences between the U.S.-China relationship today and the U.S.-Soviet relationship before the outbreak of the Cold War, but one is that the U.S. and China are deeply intertwined through geo-economic interdependence. Now, the rapid and global diffusion of technology is accelerating these changes.

Some of the most important variables determining the world's power structure today are still economic: will the U.S. economy rebound? Will Europe pull together or pull apart? Will China's astounding growth continue, stall, or bust? But an increasing number of those variables are technological, which means that the course and growth of technology itself -- and the question of who masters it -- will play a greater role in geo-politics.

China, for example, faces enormous environmental challenges, but the country can't conquer its way to sustainability and is already suffering ecological consequences from over-pollution. That is part of why it has become the world's greatest manufacturer of solar cells, and perhaps one day electric cars as well. The Communist Party has ordered a number of smog-covered cities and regions to curb their emissions and to acquire clean coal and other alternative energy technologies. Boosting agricultural output is also one of the seven strategic pillars of the recent Five-Year Plan. China needs to transcend geography as much as it needs to harness it. That's a technological problem.

The U.S., ever reliant on Middle Eastern oil and thus mired in its politics, might finally extract itself from this problem not through greater military force or more buying power, but through technology. That could mean developing new (and less dangerous) ways to capture domestic, cleaner-burning shale gas, or the natural gas under the Arctic ice cap.

In the developing world, generic drugs and genetically modified foods could drastically improve health, efficiency, and wealth, helping to raise many people out of poverty and perhaps mitigating some of the causes of conflict.

Of course, technology has always been a driver of history. The compass and maritime navigation helped enable colonialism, and the Reformation may not have happened without the printing press. And technological growth creates problems as well as solutions. It accelerates carbon monoxide emissions, but can help us produce alternative fuels to reduce them (although not if we don't invest in such innovation). Nuclear power can heat homes or destroy nations.

Still, technology is playing a great role in not just the events of geopolitical history but its course. If military power is inherently competitive -- the stronger your army and the weaker your neighbor's, the more powerful you become -- then economic power is more cooperative. After all, much of America's

power today is economic, but that power would decrease if China's economy collapses. Technological power is also cooperative in this way, perhaps even more so. Medical research crosses borders, for example, as do the pharmaceuticals or treatments that research can produce. China can increase its power by developing better solar panels -- perhaps in part by building on foreign technologies -- then turn around and sell them to other high-energy-consuming states, making us all better off. Like economics, technology doesn't just increase cooperation, it is the cooperation.

Whereas techno-utopians believe technology is the solution to the problem of global conflict, techno-pragmatists see technology as a tool for overcoming deeply entrenched cycles of resource and market competition. In the long-term, then, grand strategy is becoming a collective, not national, enterprise. The world has become too complex for Pax Americana to simply be followed by the next hegemonic empire. The increasingly integrated global system is shaping the states within it, much as individual powers shape the system. The question is thus not who controls technology, but the way in which we develop, guide, and control it collectively.

Adapted from Ayesha & Parag Khanna's *Hybrid Reality: Thriving in the Emerging Human-Technology Civilization* (TED Books, 2012).