# 1nc r2 peninsula

## Off

### 1

#### Interp – “the” is a definite article that refers to one group. Affs must not specify a subset of appropriation by private entities.

**Rinnert et al 86,** Professor Emeritus at Hiroshima City University, Paper presented at the Japan Association of Language Teachers' International Conference on Language Teaching and Learning (Teaching the English Article System, Nov 1986, Speeches/Conference Papers (150) -- Reports - Descriptive (141) -- Tests/Evaluation Instruments (160)) KD

PRINCIPLE 4 MODIFIERS BEFORE AND AFTER THE NOUN Very often, the uniqueness of the thing being talked about is indicated by adding limiting modifiers to the noun being used to refer to that thing. This is why superlative noun phrases, for example, are always preceded by the. a. the best students in the class... b. the highest mountain in the world... c. the person that I love most... But uniqueness is not always indicated by superlatives; there are many other ways. In effect, **when the meaning of the modifier limits the meaning of the noun so that it can refer to just one thing or things**, then, as usual, **the is used in front of the noun**, e.g the only way to finish this assignment on time... e. the very same day... f. the girl that we met at the party yesterday In many cases, the use of the before a noun qualified by limiting modifiers can be seen as another "shortcut" for the writer. Instead of saying, "There are people. They live in China." the writer can simply say, "The people of China..." The following examples are similar: g. the student in the corner... (There is a student; the student is in the corner.) h. the man who came by... (There is a man; he came by.) i. the idea that you gave us... (There is an idea; you gave it to us.) j. the woman watching us... (There is a woman; she is watching us.) k. the people interested in economy... (There are people; they are interested in economy.) (See Appendix B, sample exercises 13 and 14.) **If a writer is talking about something** in general (i.e. non-unique), the indefinite article is used, no matter how many times it is referred to again. But if it is made **specific with limiting modifiers, then the definite aritcle is used**. For example, when the word curiosity in the following passage is used in a general sense, the indefinite article (0) is used; however, when curiosity is limited to a specific kind by the use of limiting modifiers, the definite article the is used. We all need 0 curiosity. 0 curiosity is important because it can stimulate us to look for new truths and learn new lessons. Unfortunately, much of education stifles 0 curiosity. **For example, the curiosity to know** how things work is often discouraged by adults who grow tired of children's constant questioning. These adults have long ago lost the curiosity they once felt as children. It sometimes takes furhter education to stimulate 0 curiosity again for such people. (See Appendix B, exercises 15-18.)

#### Vote neg—

#### 1] Limits— hundreds of types of appropriation that the aff can pick from and limitless combinations underlimits the topic and destroys neg prep since there’s no unifying DA against mining, space tourism, satellites, space col, and debris -- aff gets infinite prep and sets terms for debate so DAs and PICs are inherently reactive and its absurd to say potential neg abuse justifies the aff being flat-out non-T-- limits outweighs – reciprocal prep burden and allows for nuanced engagement

#### 2] Textuality is an independent voter—it determines which interps your ballot can endorse by providing the only salient focal point for debates

#### Even if they win their interp pragmatically true, you only have jurisdiction to vote on topical advocacies, you can’t vote affirmative if they haven’t affirmed.

#### Use competing interps - Topicality is a binary question, you can’t be reasonably topical and it invites a race to the bottom of intervention

#### Drop the debater – dropping the argument doesn’t rectify abuse since winning T proves why we don’t have the burden of rejoinder against their aff.

### 2

#### Interpretation: the affirmative must only defend that the appropriation of space by private entities is unjust.

#### China's "private" sector companies aren't private

Olson 20 [Stephen Olson, research fellow at the Hinrich Foundation. "Are Private Chinese Companies Really Private?" The Diplomat, 9-30-2020, accessed 1-14-2022, https://thediplomat.com/2020/09/are-private-chinese-companies-really-private/] HWIC

China has often been criticized for a lack of transparency, especially with regard to its economic and trade policies. While in many cases these criticisms are valid, it belies the fact that in other instances, China is remarkably open and transparent about its intentions and ambitions.

Such is the case with China’s “Opinion on Strengthening the United Front Work of the Private Economy in the New Era,” recently released by the Central Committee of the Chinese Communist Party (and further elaborated on by President Xi Jinping himself). This document tells us in no uncertain terms that Chinese private companies will be increasingly called upon to conduct their operations in tight coordination with governmental policy objectives and ideologies. The rest of the world should take note.

A Different Vision of “Private” Business

The 5,000 word “opinion” aims to ratchet-up the role and influence of the CCP within the private sector in order “to better focus the wisdom and strength of the private businesspeople on the goal and mission to realize the great rejuvenation of the Chinese nation.” The objective is to establish a “united front” between business and government and facilitate the “enhancement of the party’s leadership over the private economy.” According to the plan, “private economic figures are to be more closely united around the party,” thereby achieving “a high degree of consistency with the Party Central Committee on political stand, political direction, political principles, and political roads.”

All of this stands in stark contrast to long-accepted concepts of how private companies function in a free market. The overriding purpose of business, according to these traditional precepts, is to earn profits through the provision of value-added products and services, in response to marketplace signals and under the constraint of basic economic realities. Government ideology plays no role in that equation.

But China has a very different vision. Government officials and government ideologies are directly infused into business operations. Private sector employees are “educated” on government policies and ideologies, with the expectation that this “enlightenment” will help inform their business decisions. This government-business symbiosis is further cemented by the provision of massive government subsidies (estimated to be about 3 percent of China’s GDP) to Chinese companies.

#### Negate – they skirt the core controversy of the topic which is national vs private space activities – kills stasis point and pre-round prep and means we lose access to generics that rely on the motives of private companies differing from national interest proven by the fact that their advantage is functionally China space good/bad – competing interps and DTD on T, it's a question of models and we indict their advocacy

### 3

#### Xi is tightening control over the PLA but completing goals are critical.

Krishnan 21 – Ananth, 11/18/21, [‘Xi tightened control over the PLA’, TheHindu, <https://www.thehindu.com/news/international/xi-tightened-control-over-the-pla/article37549460.ece>] Justin

The new resolution on history passed last week by China’s ruling Communist Party has said that President Xi Jinping had tightened control over the military to address the party’s “obviously lacking” leadership of the armed forces under his predecessors.

The full text of the resolution, released on Tuesday evening, listed some of the actions taken by the People’s Liberation Army (PLA) under Mr. Xi, who is also the chairman of the Central Military Commission. These included what the document described as “major operations related to border defence”.

No specifics

It did not specify what those major operations were. China has unresolved land borders with India and Bhutan. In April 2020, the PLA mobilised two divisions and carried out multiple transgressions across the Line of Actual Control (LAC) in Eastern Ladakh, sparking the worst crisis along the border in many years. Talks to resolve the tensions are still on-going.

“The armed forces have remained committed to carrying out military struggles in a flexible manner to counter military provocations by external forces, and they have created a strong deterrent against separatist activities seeking ‘Taiwan independence,’” the resolution said.

“They have conducted major operations related to border defence, protecting China’s maritime rights, countering terrorism and maintaining stability, disaster rescue and relief, fighting COVID-19, peacekeeping and escort services, humanitarian assistance, and international military cooperation.”

Last week’s resolution on history was only third such document putting forth the official view on party history, following resolutions passed by Mao Zedong in 1945 and Deng Xiaoping in 1981.

The new resolution dealt more with the future than the past. It essentially reaffirmed the official view on history, saying that the “basic points and conclusions” of past resolutions “remain valid to this day.”

It repeated the conclusion reached in 1981 on Mao’s errors noting that “mistakes were made” and that “Mao Zedong’s theoretical and practical errors concerning class struggle in a socialist society became increasingly serious” leading to the disasters of the Cultural Revolution.

Criticism of predecessors

Much of the new resolution focuses on emphasising Mr. Xi’s leadership and calling for the party to support his “core” status. It only briefly mentioned Mr. Xi’s predecessors Jiang Zemin and Hu Jintao, and implicitly critcised some aspects of their leadership including on military matters.

“For a period of time, the party’s leadership over the military was obviously lacking,” it noted. “If this problem had not been completely solved, it would not only have diminished the military’s combat capacity, but also undermined the key political principle that the party commands the gun.”

The document said Mr. Xi’s leadership had tightened supervision on the military including boosting “troop training and battle preparedness”, and it repeated China’s stated goals of completing the modernisation of its armed forces by 2035 and building a “world class” military by 2050, which observers see as meaning on par with the U.S.

‘Working vigorously’

“To build strong people’s armed forces, it is of paramount importance to uphold the fundamental principle and system of absolute party leadership over the military, to ensure that supreme leadership and command authority rest with the party Central Committee and the Central Military Commission (CMC), and to fully enforce the system of the CMC chairman assuming overall responsibility,” the resolution said, adding that “setting their sights on this problem, the Central Committee and the CMC have worked vigorously to govern the military with strict discipline in every respect.”

#### The commercial space sector is one of the PLAs central goals – the plan is a 180.

Bartholomew & Cleveland 19 – Carolyn and Robin, 4/25/19, Chairmen and Vice Chairmen. Section is written from Michael A. McDevitt, US Congressperson, [“HEARING ON CHINA IN SPACE: A STRATEGIC COMPETITION?,” <https://www.uscc.gov/sites/default/files/transcripts/April%2025%2C%202019%20Hearing%20Transcript%20%282%29.pdf>] Justin

As the Chairman said, China is determined to become a leading space power, which requires continuing to boost its innovation capabilities, both in its civilian and military sectors. The People’s Liberation Army is closely involved in most if not every aspect of China’s space program, from helping formulate and execute national space goals to overseeing China’s human spaceflight program. Coverage of China’s space program must treat seriously the implications of the reality that in many cases the boundaries between the military and civil silos of China’s program are thin, if they exist at all.

Our second panel today will address the application of what China calls its “military-civil fusion” strategy to its space sector. Military-civil fusion, a strategic concept designed to harness civilian sector innovation to power China’s military and technological modernization with the goal of leapfrogging the United States and becoming a technological powerhouse. Space has been designated as an especially important sector for military-civil fusion, and the impacts of this campaign on China’s burgeoning commercial space sector—itself a recipient of generous government support and protection—will be crucial as Chinese companies increasingly seek to compete in the international marketplace. Military-civil fusion is especially worthy of attention due to its continued reliance on technology transfer, by hook or by crook, to fuel China’s industrial and military growth.

Our third and final panel today will examine China’s military space and counterspace activities. Since its direct-ascent kinetic antisatellite test in 2007, which was responsible for a large amount of all space debris currently in Earth’s orbit, China has continued to invest in a variety of offensive antisatellite capabilities. Indeed, China’s counterspace arsenal contains many options: earlier this month, Acting Secretary of Defense Patrick Shanahan said China “has exercised and continues to develop” jamming capabilities; is deploying directed-energy counterspace weapons; has deployed an operational ground-based antisatellite missile system; and is prepared to use cyberattacks against U.S. space systems.

#### That triggers backlash – they don’t support restrictions on the space sector and will do everything to convince leaders not to do the plan – independently, is a reason the plan gets circumvented

Cheng 14 [Dean Cheng, Senior Research Fellow in the Asia Studies Center at the Heritage Foundation, Former Senior Analyst at the China Studies Division of the Center for Naval Analyses, Former Senior Analyst with Science Applications International Corporation, “Prospects for U.S.-China Space Cooperation”, Testimony before the Committee on Commerce, Science, and Transportation, United States Senate, 4/9/2014, https://www.heritage.org/testimony/prospects-us-china-space-cooperation]

At the same time, space is now a sector that enjoys significant political support within the Chinese political system. Based on their writings, the PLA is clearly intent upon developing the ability to establish “space dominance,” in order to fight and win “local wars under informationized conditions.”[8] The two SOEs are seen as key parts of the larger military-industrial complex, providing the opportunities to expose a large workforce to such areas as systems engineering and systems integration. It is no accident that China’s commercial airliner development effort tapped the top leadership of China’s aerospace corporations for managerial and design talent.[9] From a bureaucratic perspective, this is a powerful lobby, intent on preserving its interests. China’s space efforts should therefore be seen as political, as much as military or economic, statements, directed at both domestic and foreign audiences. Insofar as the PRC has scored major achievements in space, these reflect positively on both China’s growing power and respect (internationally) and the CCP’s legitimacy (internally). Efforts at inducing Chinese cooperation in space, then, are likely to be viewed in terms of whether they promote one or both objectives. As China has progressed to the point of being the world’s second-largest economy (in gross domestic product terms), it becomes less clear as to why China would necessarily want to cooperate with other countries on anything other than its own terms. Prospects for Cooperation Within this context, then, in. China’s past experience of major high-technology cooperative ventures (Sino–Soviet cooperation in the 1950s, U.S.–China cooperation in the 1980s until Tiananmen, and Sino–European space cooperation on the Galileo satellite program) is an unhappy one, at best. The failure of the joint Russian–Chinese Phobos–Grunt mission is likely seen in Beijing as further evidence that a “go-it-alone” approach is preferable. Nor is it clear that, bureaucratically, there is significant interest from key players such as the PLA or the military industrial complex in expanding cooperation.[10] Moreover, as long as China’s economy continues to expand, and the top political leadership values space efforts, there is little prospect of a reduction in space expenditures—making international cooperation far less urgent for the PRC than most other spacefaring states. [FOOTNOTE] [10]It is worth noting here that the Chinese Ministry of Foreign Affairs is not a part of the CCP Politburo, a key power center in China. Thus, the voice of the Ministry of Foreign Affairs is muted, at best, in any internal debate on policy. [END FOOTNOTE] If there is likely to be limited enthusiasm for cooperation in Chinese circles, there should also be skepticism in American ones. China’s space program is arguably one of the most opaque in the world. Even such basic data as China’s annual space expenditures is lacking—with little prospect of Beijing being forthcoming. As important, China’s decision-making processes are little understood, especially in the context of space. Seven years after the Chinese anti-satellite (ASAT) test, exactly which organizations were party to that decision, and why it was undertaken, remains unclear. Consequently, any effort at cooperation would raise questions about the identity of the partners and ultimate beneficiaries—with a real likelihood that the PLA would be one of them.

#### An unhinged PLA triggers Himalayan war – goes global

Chellaney 17 [Dr. Brahma Chellaney, Professor of Strategic Studies at the Center for Policy Research and Fellow at the Robert Bosch Academy, PhD in International Studies from Jawaharlal Nehru University, “Why the Chinese Military’s Rising Clout Troubles Xi Jinping”, The National, 9/9/2017, https://www.thenational.ae/opinion/why-the-chinese-military-s-rising-clout-troubles-xi-jinping-1.626815?videoId=5754807360001]

China’s president Xi Jinping has stepped up his domestic political moves in the run-up to the critical 19th national congress of the Chinese Communist Party next month, but he is still struggling to keep the People’s Liberation Army (PLA) in line. China’s political system makes it hard to get a clear picture, yet Mr Xi’s actions underscore the troublesome civil-military relations in the country. Take the recent standoff with India that raised the spectre of a Himalayan war, with China threatening reprisals if New Delhi did not unconditionally withdraw its forces from a small Bhutanese plateau, which Beijing claims is Chinese territory. After 10 weeks, the face-off on the Doklam Plateau ended with both sides pulling back troops and equipment from the site on the same day, signalling that Beijing, not New Delhi, had blinked. The mutual-withdrawal deal was struck just after Mr Xi replaced the chief of the PLA’s joint staff department. This key position, equivalent to the chairman of the US joint chiefs of staff, was created only last year as part of Mr Xi’s military reforms to turn the PLA into a force “able to fight and win wars”. The Doklam pullback suggests that the removed chief, Gen Fang Fenghui, who has since been detained for alleged corruption, was an obstacle to clinching a deal with India. To be sure, this was not the first time that the PLA’s belligerent actions in the Himalayas imposed diplomatic costs on China. A classic case happened when Mr Xi reached India on a state visit in September 2014. He arrived on Indian prime minister Narendra Modi’s birthday with a strange gift for his host, a predawn Chinese military encroachment deep into India’s northern region of Ladakh. The encroachment, the worst in many years in terms of the number of intruding troops, overshadowed Mr Xi’s visit. It appeared bizarre that the military of an important power would seek to mar the visit of its own head of state to a key neighbouring country. Yet Chinese premier Li Keqiang’s earlier visit to New Delhi in 2013 was similarly preceded by a PLA incursion into another part of Ladakh that lasted three weeks. Such provocations might suggest that they are intentional, with the Chinese government in the know, thus reflecting a preference for blending soft and hard tactics. But it is also possible that these actions underscore the continuing “disconnect between the military and the civilian leadership” in China that then US defence secretary Robert Gates warned about in 2011. During his 2014 India trip, Mr Xi appeared embarrassed by the accompanying PLA encroachment and assured Mr Modi that he would sort it out upon his return. Soon after he returned, the Chinese defence ministry quoted Mr Xi as telling a closed-door meeting with PLA commanders that “all PLA forces should follow the president’s instructions” and that the military must display “absolute loyalty and firm faith in the party”. Recently Xi conveyed that same message yet again when he addressed a parade marking the 90th anniversary of the PLA’s creation on August 1, 1927. Donning military fatigues, Mr Xi exhorted members of his 2.3-million-strong armed forces to “unswervingly follow the absolute leadership of the party.” Had civilian control of the PLA been working well, would Mr Xi repeatedly be demanding “absolute loyalty” from the military or asking it to “follow his instructions”? China does not have a national army; rather the party has an army. So the PLA has traditionally sworn fealty to the party, not the nation. Under Mr Xi’s two immediate predecessors, Hu Jintao and Jiang Zemin, the PLA gradually became stronger at the expense of the party. The military’s rising clout has troubled Mr Xi because it hampers his larger ambition. As part of his effort to reassert party control over the military, Mr Xi has used his anti-corruption campaign to ensnare a number of top PLA officers. He has also cut the size of the ground force and established a new command-and-control structure. But just as a dog’s tail cannot be straightened, asserting full civil control over a politically ascendant PLA is proving unachievable. After all, the party depends on the PLA to ensure domestic order and sustain its own political monopoly. The regime’s legitimacy increasingly relies on an appeal to nationalism. But the PLA, with its soaring budgets and expanding role to safeguard China’s overseas interests, sees itself as the ultimate arbiter of nationalism. To make matters worse, Mr Xi has made many enemies at home in his effort to concentrate power in himself, including through corruption purges. It is not known whether the PLA’s upper echelon respects him to the extent to be fully guided by his instructions. In the past decade, the PLA’s increasing clout has led China to stake out a more muscular role. This includes resurrecting territorial and maritime disputes, asserting new sovereignty claims, and using construction activity to change the status quo. China’s cut-throat internal politics and troubled civil-military relations clearly have a bearing on its external policy. The risks of China’s rise as a praetorian state are real and carry major implications for international security.

#### Extinction.

Caldicott 17 – Helen, 2017, Founder of Physicians for Social Responsibility [“The new nuclear danger: George W. Bush's military-industrial complex,” The New Press]//Elmer

The use of Pakistani nuclear weapons could trigger a chain reac­tion. **Nuclear-armed India, an ancient enemy, could respond** in kind. China, India's hated foe, could react if India used her nuclear weapons, triggering a nuclear [war] ~~holocaust~~ on the subcontinent. If any of either **Russia** or **America**'s 2,250 strategic weapons on hair-trigger alert were launched either **accidentally** or **purposefully** in response, **nuclear winter** would ensue, meaning the **end of most life on earth**.

### 4

#### China’s space strategies strengthen deterrence now. PLA deterrence is key to joint operations, which ensure Chinese modernization beyond space.

* AT: Old – Doesn’t matter its about space deterrence strategies leading to joint operations, they need ev that those strategies don’t exist or are unsuccessful
* Deterrence kickstarts joint operations which encourage synergies among services and highlights strengths and weaknesses

Cheng 11 Dean Cheng is a Research Fellow in Chinese Political and Security Affairs in the Asian Studies Center at The Heritage Foundation. August 16, 2011. “China’s Space Program: A Growing Factor in U.S. Security Planning” [China’s Space Program: A Growing Factor in U.S. Security Planning (indianstrategicknowledgeonline.com)](https://indianstrategicknowledgeonline.com/web/bg2594.pdf) Accessed 12-17 // gord0

China’s space efforts are not simply the actions of the People’s Liberation Army (PLA) or efforts at political signaling to obtain a space arms control treaty, as some have posited. Rather, these actions occur within a particular strategic and military context. The first contextual element is the broadening view of the PLA’s responsibilities. One of the PLA’s foremost tasks is to preserve the rule of the Chinese Communist Party (CCP). As the PRC’s economic and national interests have expanded beyond its borders, what is deemed essential for preserving the party’s power has also expanded. To this end, Hu Jintao and his predecessor, Jiang Zemin, set forth the new “historic missions” of the PLA. Not only do these new historic missions sustain the longstanding duty of providing support to the CCP, but now the PLA is responsible for helping to safeguard China’s national development, its expanding national interests, and furthering the objective of maintaining global stability and peace. Hence, the PLA is expanding China’s space capabilities in this strategic, national light, especially given the PLA’s roles in safeguarding national development and interests. To fulfill these historic missions, the PLA must be able to exploit space at times and places of its own choosing and, equally important, be able to deny an opponent the same freedom of action. PLA writings increasingly mention the need for a deterrence capacity in space and elsewhere. To these historic missions must be added the additional task of constraining conflicts, both by preventing their outbreak and by limiting their extent if they occur nonetheless. Both of these tasks fall under the rubric of deterrence. As the PRC’s economic and national interests have expanded beyond its borders, what is deemed essential for preserving the party’s power has also expanded. What is striking, however, is that, while Western writings on deterrence generally focus on dissuading an opponent from performing actions that the deterring power would prefer it not undertake, Chinese writings also talk about compellence. That is, to deter an opponent successfully, the PLA must not only dissuade, but also be able to coerce an opponent into undertaking actions that the deterred power would prefer not to do. In this regard, Chinese discussions about deterrence not only note roles for conventional and nuclear forces, but also highlight the importance of space deterrence. Finally, by way of context, the PLA continues to improve its ability to undertake joint operations. This interest in joint operations was already evident a decade ago, when the PLA promulgated a variety of gangyao that would help to guide future military planning, training, and operations.3 The capstone of these gangyao was devoted to joint military operations. The ability to conduct joint operations is portrayed as a hallmark of Local Wars Under High-Tech tions, because such operations allow synergies among services, pit one’s strengths against its opponent’s strengths, and shield one’s weaknesses. As the 2010 edition of China’s National Defense, China’s biennial defense white paper, notes, “The PLA takes the building of joint operation systems as the focal point of its modernization and preparations for military struggle.”4 According to various PLA analyses, the key to successful joint operations is the ability to gather, transmit, and exploit information. Indeed, the very description of future wars has shifted from Local Wars Under High-Tech Conditions to Local Wars Under Informationalized Conditions—the most important high technologies are those related to information technology. Similarly, the 2010 Chinese defense white paper notes that the PLA “strives to enhance its fighting capabilities based on information systems.”5 Only the high ground of space can provide the opportunity to gather information; transmit it rapidly, securely, and reliably; and exploit it promptly. To create synergistic effects, widely dispersed units must be able to establish a common situational awareness framework and to coordinate their activities, timing their operations to maximize mutual support. If future wars will be marked by the “three nons” of non-contact, nonlinear, and nonsymmetrical operations, then information will be the keystone of success in future wars. In order to effect joint operations, according to PLA analyses, a military must be able to exploit space. Only the high ground of space can provide the opportunity to gather information; transmit it rapidly, securely, and reliably; and exploit it promptly. PLA writings describe space as essential for reconnaissance and surveillance, communications, navigation, weather forecasting, and battle damage assessment. A military that is capable of effective joint operations can also deter an opponent. Thus, space capabilities strengthen conventional deterrence as well as deterring in their own right. The PLA has an interest in achieving space dominance to fulfill its historic tasks, to deter future conflicts if possible, and to fight and win Local Wars Under Informationalized Conditions if necessary. This context suggests that China is following a particular method in developing an expanding array of space capabilities, including a growing range of satellites, a new heavy-lift space launcher, and a fourth launch site on Hainan Island, which is much nearer the equator. This underlying interest is reflected in certain space missions, which PLA writings suggest are particularly important. Most obviously, the PLA expects improved space information support. With each passing year, China’s satellite constellations will provide better information to military users. Today, Chinese systems provide not only basic earth observation capabilities, but also: • An autonomous navigation system, which is already operational, unlike the European Galileo system; • Data relay capacity; • Weather forecasting; and • Earth observation, including growing maritime surveillance capability. In addition, China’s improving space capabilities, coupled with its steadily advancing conventional capabilities, will provide the increased ability to seek space superiority or space dominance (zhitian quan) through a combination of space offensive and defensive operations.

#### Private entities key – Xi needs them for innovation and modernization

**Patel 21** [Neel V. Patel, Neel is a space reporter for MIT Technology Review. 1-21-2021, "China’s surging private space industry is out to challenge the US," MIT Technology Review, <https://www.technologyreview.com/2021/01/21/1016513/china-private-commercial-space-industry-dominance/> accessed 12/14/21] Adam recut gord0

Until recently, China’s space activity has been overwhelmingly dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC). A few private space firms have been allowed to operate in the country for a while: for example, there’s the China Great Wall Industry Corporation Limited (in reality a subsidiary of CASC), which has provided commercial launches since it was established in 1980. But for the most part, China’s commercial space industry has been nonexistent. Satellites were expensive to build and launch, and they were too heavy and large for anything but the biggest rockets to actually deliver to orbit. The costs involved were too much for anything but national budgets to handle.

That all changed this past decade as the costs of making satellites and launching rockets plunged. In 2014, a year after Xi Jinping took over as the new leader of China, the Chinese government decided to treat civil space development as a key area of innovation, as it had already begun doing with AI and solar power. It issued a policy directive called [Document 60](https://archive.md/o/bc9l4/www.cpppc.org/en/zy/994006.jhtml) that year to enable large private investment in companies interested in participating in the space industry.

“Xi’s goal was that if China has to become a critical player in technology, including in civil space and aerospace, it was critical to develop a space ecosystem that includes the private sector,” says Namrata Goswami, a geopolitics expert based in Montgomery, Alabama, who’s been studying China’s space program for many years. “He was taking a cue from the American private sector to encourage innovation from a talent pool that extended beyond state-funded organizations.”

As a result, there are now 78 commercial space companies operating in China, according to a[2019 report by the Institute for Defense Analyses](https://archive.md/o/bc9l4/https:/www.ida.org/-/media/feature/publications/e/ev/evaluation-of-chinas-commercial-space-sector/d-10873.ashx). More than half have been founded since 2014, and the vast majority focus on satellite manufacturing and launch services.

For example, Galactic Energy, founded in February 2018, is building its Ceres rocket to offer rapid launch service for single payloads, while its Pallas rocket is being built to deploy entire constellations. Rival company i-Space, formed in 2016, became the first commercial Chinese company to make it to space with its Hyperbola-1 in July 2019. It wants to pursue reusable first-stage boosters that can land vertically, like those from SpaceX. So does LinkSpace (founded in 2014), although it also hopes to use rockets to deliver packages from one terrestrial location to another.

Spacety, founded in 2016, wants to turn around customer orders to build and launch its small satellites in just six months. In December it launched a miniaturized version of a satellite that uses 2D radar images to build 3D reconstructions of terrestrial landscapes. Weeks later, it [released the first images taken by the satellite](https://archive.md/o/bc9l4/https:/spacenews.com/spacety-releases-first-sar-images/), Hisea-1, featuring three-meter resolution. Spacety wants to launch a constellation of these satellites to offer high-quality imaging at low cost.

To a large extent, China is following the same blueprint drawn up by the US: using government contracts and subsidies to give these companies a foot up. US firms like SpaceX benefited greatly from NASA contracts that paid out millions to build and test rockets and space vehicles for delivering cargo to the International Space Station. With that experience under its belt, SpaceX was able to attract more customers with greater confidence.

Venture capital is another tried-and-true route. The IDA report estimates that VC funding for Chinese space companies was up to $516 million in 2018—far shy of the $2.2 billion American companies raised, but nothing to scoff at for an industry that really only began seven years ago. At least 42 companies had no known government funding.

And much of the government support these companies do receive doesn’t have a federal origin, but a provincial one. “[These companies] are drawing high-tech development to these local communities,” says Hines. “And in return, they’re given more autonomy by the local government.” While most have headquarters in Beijing, many keep facilities in Shenzhen, Chongqing, and other areas that might draw talent from local universities.

There’s also one advantage specific to China: manufacturing. “What is the best country to trust for manufacturing needs?” asks James Zheng, the CEO of Spacety’s Luxembourg headquarters. “It’s China. It’s the manufacturing center of the world.” Zheng believes the country is in a better position than any other to take advantage of the space industry’s new need for mass production of satellites and rockets alike.

#### Chinese military modernization functions as a deterrent for nuclear war with the US

* AT: Not About Space – the internal link argument is in Cheng. “space capabilities strengthen conventional deterrence”. It also says space is the only way to “establish a common situational awareness framework”
* First, JL-2 Subs enable SSBN’s to attack the US, and A2/AD strategy further deters US interventions.
* Second, joint operation modernization allows for China to join Russia-US nuclear arms control talks. That changes distribution power and deterrence but only with hard military power strengthened by modernization.

Cimbala 15 Stephen J Cimbala, Professor of Political Science at PSU Brandywine. Summer 2015. “Chinese Military Modernization” [Chinese Military modernization: Implications for Strategic Nuclear Arms Control (af.edu)](https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-09_Issue-2/cimbala.pdf#:~:text=China%E2%80%99s%20political%20and%20military%20objectives%20in%20Asia%20and,two%20follow-on%20challenges%3A%20escala-tion%20control%20and%20nuclear%20signaling.) Accessed 12-18 // gord0

China’s political and military objectives in Asia and worldwide differ from those of the United States and Russia, reflecting a perception of that nation’s own interests and of its anticipated role in the emerging world order.1 Its growing portfolio of smart capabilities and modernized platforms includes stealth aircraft, antisatellite warfare systems, quiet submarines, “brilliant” torpedo mines, improved cruise missiles, and the potential for disrupting financial markets. Among other indicators, China’s already deployed and future Type 094 Jin-class nuclear ballistic missile submarines (SSBN), once they are equipped as planned with JL-2 submarine launched ballistic missiles, will for the first time enable Chinese SSBNs to target parts of the United States from locations near the Chinese coast. Along with this, China’s fleet of nuclear-powered attack submarines supports an ambitious anti-access/area denial (A2/AD) strategy to deter US military intervention to support allied interests in Asia against Chinese wishes.2 China’s diplomacy creates additional space for maneuver between Russian and American perceptions. While China may lack the commitment to arms control transparency, the nation’s current and future military modernization entitles Beijing to participate in future Russian-American strategic nuclear arms control talks. Entering China into the US-Russian nuclear-deterrence equation creates considerable analytical challenges, for a number of reasons. To understand these challenges one must consider the impact of China’s military modernization, which creates two follow-on challenges: escalation control and nuclear signaling. Military Modernization China’s military modernization is going to change the distribution of power in Asia, including the distribution of nuclear and missile forces. This modernization draws not only on indigenous military culture but also on careful analysis of Western and other experiences. As David Lai has noted, “The Chinese way of war places a strong emphasis on the use of strategy, stratagems, and deception. However, the Chinese understand that their approach will not be effective without the backing of hard military power. China’s grand strategy is to take the next 30 years to complete China’s modernization mission, which is expected to turn China into a true great power by that time.”3 Chinese military modernization and defense guidance for the use of nuclear and other missile forces hold some important implications for US policy. First, Chinese thinking is apparently quite nuanced about the deterrent and defense uses for nuclear weapons. Despite the accomplishments of modernization thus far, Chinese leaders are aware that their forces are far from nuclear-strategic parity with the United States or Russia. Conversely, China may not aspire to this model of nuclear strategic parity, such as between major nuclear powers, as the key to war avoidance by deterrence or other means. China may prefer to see nuclear weapons as one option among a spectrum of choices available in deterring or fighting wars under exigent conditions and as a means of supporting assertive diplomacy and conventional operations when necessary. Nuclear-strategic parity, as measured by quantitative indicators of relative strength, may be less important to China than the qualitative use of nuclear and other means as part of broader diplomatic-military strategies.4 Second, China is expanding its portfolio of military preparedness not only in platforms and weapons but also in the realms of command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) and information technology. Having observed the US success in Operation Desert Storm against Iraq in 1991, Chinese military strategists concluded that the informatization of warfare under all conditions would be a predicate to future deterrence and defense operations.5 As Paul Bracken has noted, the composite effect of China’s developments is to make its military more agile—meaning, more rapidly adaptive and flexible.6 The emphasis on agility instead of brute force reinforces traditional Chinese military thinking. Since Sun Tzu, the acme of skill has been winning without fighting, but if war is unavoidable, delivering the first and decisive blows is essential. This thinking also stipulates that one should attack the enemy’s strategy and his alliances, making maximum use of deception and basing such attacks on superior intelligence and estimation. The combination of improved platforms and command-control and information warfare should provide options for the selective use of precision fire strikes and cyberattacks against priority targets while avoiding mass killing and fruitless attacks on enemy strongholds.7

## Case

### Solvency

#### Chinese space industry is overwhelmingly dominated by the government—private enterprises cannot exist independently under domestic law

Nie 12-24 (Mingyan Nie, JD; Nanjing University of Aeronautics and Astronautics Department of Law; 12-24-2021; "The Growth of China’s Non-governmental Space Sector in the Context of Government Support for Public-Private Partnerships: An Assessment of Major Legal Challenges";S*pace Policy* (2021) https://doi.org/10.1016/j.spacepol.2021.101461., accessed 1-14-2022; JPark)

* PPPs = public-private partnerships
* Strict and opaque governmental regulation basically makes it impossible for private entities to act independently and are subsumed by the state
* Laws are deliberately unclear to maximize state control – e.g., classifying launch vehicles as weapons

In light of China’s recent policies and other measures, it is evident that decision-makers in the space industry intend to privatize space activities to meet urgent market demands and social goals, including promoting PPPs.19 However, the military dominates the Chinese space industry, and the government controls nearly all civil space activities, while state-owned companies conduct programs related to space exploration. These dynamics have led to an unclear administration of space activities that has created an unstable environment for the growth of private enterprises. In addition, the reality of military-dominated space activities has engendered harsh regulations for all non-governmental affairs related to space exploration. 3.1. Complex administration of space activities and the non-governmental participation The role of the military and the government in the space field has resulted in a complicated framework for governing space activities in China. SASTIND, which was established under the Ministry of Industry and Information Technology of the PRC (MIIT), is the main administrative body under the State Council tasked with coordinating and managing the country’s space activities20. The impact of China’s military on space activities is extremely relevant. The role of the Equipment Development Department (EDD), which belongs to the People’s Republic of China Central Military Commission,21 is also notable. The EDD is qualified to conduct space projects directly. For instance, the human spaceflight program and the launching infrastructure, including launching sites and the hub of China’s telemetry, tracking, and control network, are mainly operated by the EDD. Furthermore, the EDD collaborates with SASTIND to establish regulations, monitor their implementation, allocate research funds, and determine the qualification of private entities to enter the space industry [[17], p.13]. This complicated and opaque organizational structure is detrimental to the participation of private actors in space-related activities in China. Space facilities, including launching sites, are controlled by the military that does not distinguish the nature of space activities. Thus, private enterprises with a sole focus on developing commercial space activities will have to fulfill the same high-level military requirements as the government. Additionally, the co-existence of more than one administrative body with similar supervision functions impedes non-governmental enterprises’ involvement in space activities [[31], pp. 4–5]. 3.2. Strict supervision of non-governmental entry into the space field: focusing on launch activities and satellite development In contrast to the United States, which promotes private entities to comprehensively participate in numerous space areas through PPPs [5], existing Chinese PPP policies related to space activities stress the domains of space science research, the launching of commercial satellites, the manufacture and operation of satellites, space infrastructure construction, and so on.22 The newly defined scope of the new type of infrastructure in China contains satellite internet, which motivates the creation of PPPs in space programs, and demands the growth of private participants to succeed in doing so. The fields of most relevance to this are launching activities and satellite development (including micro-satellite). Furthermore, emerging non-governmental space corporations are mainly interested in developing their launching and satellite manufacturing capacities (including micro-satellites) [32]. This is consistent with the policy requirements and constitutes a good starting point for conducting space PPPs and will, in turn, contribute to the growth of the commercial space industry. However, the administration of the rules of these areas is unfavorable for the non-governmental sector. Concerning launch activities, in June 2019, SASTIND and EDD announced the ‘Notice on Promoting the Orderly Development of Commercial Launch Vehicles’ (2019 Notice) [33]. Commercial launch activities are divided into phases of research and development, manufacturing, and launching. For non-governmental entities that intend to get involved in any of these phases, authorization is required. However, conditions and other requirements for obtaining such permissions are unfavorable. For example, launch vehicles are identified as a weapon. Given that SASTIND provides authorization for the research, development, and manufacture of weapons, any related technology must comply with the ‘Regulation on the Administration of Licenses for Scientific Research and Production of Weapons and Equipment’23 and the ‘Measures for the Implementation of the License for Scientific Research and Production of Weapons and Equipment’.24 Furthermore, the 2019 Notice states that every applicant must receive support from the provincial government where its enterprise is registered. The involved provincial government must inform SASTIND by issuing a letter to express their support and elaborate supervision measures to ensure that relevant enterprises have conducted the authorized space activities in compliance with confidentiality, safety, security, and quality standards. Thus, before conducting authorized operations, a notification to SASTIND and the EDD is required. The requirements stipulated in the 2019 Notice are unfavorable to private entities starting space activities for many reasons. First, the 2019 Notice refers the notification process to the EDD. However, no further details are available on this procedure. Moreover, the specific functions of the EDD in this process are not explained. Second, the relevant provincial government’s letter is a prerequisite for applying to receive authorization. Also, the provincial government’s supervision measures are the primary basis for conducting permitted activities. However, how the applicants obtain the provincial government’s approval letter is unclear. Third, whether the supervision measures elaborated by the relevant provincial government are only applicable to the specific applicant or equally applicable to similar subsequent applicants is not addressed [[31], pp. 5–6]. In the context of conducting PPPs, provincial governments can act as the ‘public’ party, so if no specifics are clarified, it is difficult to ensure a fair legal environment for establishing PPPs in space, which may breed corruption. The launching phase is also strictly administrated. This phase mandates that the application of launching permits should generally be consistent with the ‘Interim Measures on the Administration of Permits for Civil Space Launch Project’, which was released in2002.25 However, an extra review process by the EDD has been added as the pre-condition for approving the permit. Furthermore, any launching activity should be carried out on officially authorized launching sites or testing grounds, administrated and controlled by the military department, and the rules thereof should be observed. When referring to the development of satellites, no regulations have been adopted thus far. Non-governmental enterprises that intend to invest in this field have to meet the requirements of national security safeguards. Accordingly, licenses are necessary. Since the government and military have historically been responsible for the research and manufacture of satellites, no specific rules applicable to the private sector can be found in this field. In 2008, the Aerospace Dongfanghong Development Ltd., Shenzhen (ADD Ltd.), a state-owned corporation, was established.26 This corporation focuses on micro-satellite development. It is the first Chinese company that received authorization to research and develop micro-satellites [35]. Before initiating micro-satellite development programs, this corporation established the ‘certified weapon and equipment quality management system’. Therefore, the corporation was qualified ‘as a weapon and equipment bearer’ and obtained permission to conduct weapon and equipment research and product and met the requirements of acting as a so-called ‘national secondary class confidential qualified corporation’.27 As a result, the ADD Ltd. example offers valuable insights into non-governmental entities that want to get involved in satellite development, especially micro-satellites, as part of the recent interest in building satellite-based interest as a new type of infrastructure. However, these conditions or qualifications are inconsistent with the fundamental policies of facilitating private growth in space-related activities. Specific rules must be formulated to remove or simplify the excessive obstacles that impede private participation in satellite development, including the development of micro-satellites and the implementation of relevant policies. Concerning the procedural requirements for satellites manufacturing, non-governmental enterprises have to get approval from the NDRC. These firms must submit application documents, including the files issued by the provincial development and reform commission, the application report, and the confidential agreement to begin work [36]. Similar to the launch permit application, these application requirements set forth by the NDRC allow for the provincial departments to determine the details of the process, creating an unstable legal environment for potential applicants. In brief, the inevitable growth of the private sector in space is the main reason for creating PPPs in space exploration. Yet, the current dominant role of the military in China’s space industry results in a complex administrative framework and strict requirements for those non-governmental entities willing to undertake space activities. This constrains the development of the private space sector that remains in an underdeveloped stage to date. In addition, ambiguous rules concerning the power of the relevant provincial departments in authorizing launching activities and satellite development make creating and effective implementation of space PPPs more difficult. However, given the growing importance of the private sector in the implementation of the PPP policies regarding space, the existing rules and regulations should be improved.

#### Private Chinese space ventures are subsumed by the public sphere and national interests under Xi

Patel '21 (Neel V. Patel; science and tech journalist, currently working as a senior editor at The Daily Beast and space reporter for MIT Tech Review; 1-21-2021; "China’s surging private space industry is out to challenge the US"; https://www.technologyreview.com/2021/01/21/1016513/china-private-commercial-space-industry-dominance/, MIT Technology Review, accessed 1-14-2022; JPark)

“The state is really great at large, ambitious projects like going to the moon or developing a large reconnaissance satellite,” says Lincoln Hines, a Cornell University researcher who focuses on Chinese foreign policy. “But it’s not responsive to meeting market needs”—one big way to encourage rapid technological growth and innovation. “I think the government thinks its commercial space sector can be complementary to the state,” he says. What are the market needs that Hines is referring to? Satellites, and rockets that can launch them into orbit. The space industry is undergoing a renaissance thanks to two big trends spurred by the commercial industry: we can make satellites for less money by making them smaller and using off-the-shelf hardware; and we can also make rockets for less money, by using less costly materials or reusing boosters after they’ve already flown (which SpaceX pioneered with its Falcon 9). These trends mean it is now cheaper to send stuff into space, and the services and data that satellites can offer have come down in price accordingly. China has seen an opportunity. A 2017 report by Bank of America Merrill Lynch estimates that the space industry could be worth up to $2.7 trillion by 2030. Setting foot on the moon and establishing a lunar colony might be a statement of national power, but securing a share of such a highly lucrative business is perhaps even more important to the country’s future. “In the future, there will be tens of thousands of satellites waiting to launch, which is a major opportunity for Galactic Energy” says Wu Yue, a company spokesperson. The problem is, China has to make up decades’ worth of ground lost to the West. How did China get here—and why? Until recently, China’s space activity has been overwhelmingly dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC). A few private space firms have been allowed to operate in the country for a while: for example, there’s the China Great Wall Industry Corporation Limited (in reality a subsidiary of CASC), which has provided commercial launches since it was established in 1980. But for the most part, China’s commercial space industry has been nonexistent. Satellites were expensive to build and launch, and they were too heavy and large for anything but the biggest rockets to actually deliver to orbit. The costs involved were too much for anything but national budgets to handle. That all changed this past decade as the costs of making satellites and launching rockets plunged. In 2014, a year after Xi Jinping took over as the new leader of China, the Chinese government decided to treat civil space development as a key area of innovation, as it had already begun doing with AI and solar power. It issued a policy directive called Document 60 that year to enable large private investment in companies interested in participating in the space industry. “Xi’s goal was that if China has to become a critical player in technology, including in civil space and aerospace, it was critical to develop a space ecosystem that includes the private sector,” says Namrata Goswami, a geopolitics expert based in Montgomery, Alabama, who’s been studying China’s space program for many years. “He was taking a cue from the American private sector to encourage innovation from a talent pool that extended beyond state-funded organizations.” As a result, there are now 78 commercial space companies operating in China, according to a 2019 report by the Institute for Defense Analyses. More than half have been founded since 2014, and the vast majority focus on satellite manufacturing and launch services. For example, Galactic Energy, founded in February 2018, is building its Ceres rocket to offer rapid launch service for single payloads, while its Pallas rocket is being built to deploy entire constellations. Rival company i-Space, formed in 2016, became the first commercial Chinese company to make it to space with its Hyperbola-1 in July 2019. It wants to pursue reusable first-stage boosters that can land vertically, like those from SpaceX. So does LinkSpace (founded in 2014), although it also hopes to use rockets to deliver packages from one terrestrial location to another. Spacety, founded in 2016, wants to turn around customer orders to build and launch its small satellites in just six months. In December it launched a miniaturized version of a satellite that uses 2D radar images to build 3D reconstructions of terrestrial landscapes. Weeks later, it released the first images taken by the satellite, Hisea-1, featuring three-meter resolution. Spacety wants to launch a constellation of these satellites to offer high-quality imaging at low cost. To a large extent, China is following the same blueprint drawn up by the US: using government contracts and subsidies to give these companies a foot up. US firms like SpaceX benefited greatly from NASA contracts that paid out millions to build and test rockets and space vehicles for delivering cargo to the International Space Station. With that experience under its belt, SpaceX was able to attract more customers with greater confidence. Venture capital is another tried-and-true route. The IDA report estimates that VC funding for Chinese space companies was up to $516 million in 2018—far shy of the $2.2 billion American companies raised, but nothing to scoff at for an industry that really only began seven years ago. At least 42 companies had no known government funding. And much of the government support these companies do receive doesn’t have a federal origin, but a provincial one. “[These companies] are drawing high-tech development to these local communities,” says Hines. “And in return, they’re given more autonomy by the local government.” While most have headquarters in Beijing, many keep facilities in Shenzhen, Chongqing, and other areas that might draw talent from local universities. There’s also one advantage specific to China: manufacturing. “What is the best country to trust for manufacturing needs?” asks James Zheng, the CEO of Spacety’s Luxembourg headquarters. “It’s China. It’s the manufacturing center of the world.” Zheng believes the country is in a better position than any other to take advantage of the space industry’s new need for mass production of satellites and rockets alike. Making friends The most critical strategic reason to encourage a private space sector is to create opportunities for international collaboration—particularly to attract customers wary of being seen to mix with the Chinese government. (US agencies and government contractors, for example, are barred from working with any groups the regime funds.) Document 60 and others issued by China’s National Development and Reform Commission were aimed not just at promoting technological innovation, but also at drawing in foreign investment and maximizing a customer base beyond Chinese borders. “China realizes there are certain things they cannot get on their own,” says Frans von der Dunk, a space policy expert at the University of Nebraska–Lincoln. Chinese companies like LandSpace and MinoSpace have worked to accrue funding through foreign investment, escaping dependence on state subsidies. And by avoiding state funding, a company can also avoid an array of restrictions on what it can and can’t do (such as constraints on talking with the media). Foreign investment also makes it easier to compete on a global scale: you’re taking on clients around the world, launching from other countries, and bringing talent from outside China. Although China is taking inspiration from the US in building out its private industry, the nature of the Chinese state also means these new companies face obstacles that their rivals in the West don’t have to worry about. While Chinese companies may look private on paper, they must still submit to government guidance and control, and accept some level of interference. It may be difficult for them to make a case to potential overseas customers that they are independent. The distinction between companies that are truly private and those that are more or less state actors is still quite fuzzy, especially if the government is a frequent customer. “That could still lead to a lack of trust from other partners,” says Goswami. It doesn’t help that the government itself is often very cagey about what its national program is even up to. And Hines adds that it’s not always clear exactly how separate these companies are from, say, the People’s Liberation Army, given the historical ties between the space and defense sectors. “Some of these things will pose significant hurdles for the commercial space sector as it tries to expand,” he says.

#### The plan has no effect—private space ventures are inextricable from public interest.

Goswami '19 (Dr. Namrata Goswami; author, strategic analyst and consultant on counter-insurgency, counter-terrorism, alternate futures, and great power politics, worked at IDSA, selected as a Jennings-Randolph Senior Fellow, won MINERVA grant and contract with JSOU; 4-5-2019; "Misplaced Confidence? The US Private Space Sector vs. China"; https://thediplomat.com/2019/04/misplaced-confidence-the-us-private-space-sector-vs-china/, The Diplomat, accessed 1-14-2022; JPark)

Over the past three years, nearly 60 private space startups have entered the private launch industry, supported by the Chinese state. Spokesperson of the China National Space Administration (CNSA), Li Guoping, specified: The output value of the satellite application sector makes up over 80 percent of the whole satellite industry chain. So we encourage private companies and social capital to invest in the application of satellite communication, remote sensing and navigation…When we make a top-level plan for China’s aerospace development, we will consider the development of commercial space activity. The government will open space programs that can be carried out in a commercial way, and buy services from commercial companies… Since 2014, Xi has urged China’s private space sector to emerge as the leader in the “implementation of civil-military integration strategy.” Xi’s policy guidance has been followed up by the PLA, which opened its Jiuquan Satellite Launch Center (China’s primary launch facility) in the northwestern Gobi Desert for private rocket launches. This civil-military integration has been identified as a priority by Xi for China’s overall national strategy with regard to outer space. The planning chief of the Jiuquan Satellite Launch Center, Jia Lide, stated that “favorable policies and targeted measures have been created for the benefit of private space enterprises.” The latter point is particularly important. The U.S. private sector does very well with strong government support, through programs like Commercial Orbital Transportation System (COTS), Commercial Crew Program, and now the Commercial Lunar Payload Service (CLPS). Most U.S. space industries still rely to a significant degree on the government market either to get started or to stay solvent.

#### Curcio–

#### 1] The first half of their evidence is about how China has always been independent in space. The one paragraph that is about buying products and export markets does not explain why that spills up to a full out partnership, much less an alliance. This alone just doesn’t mean anything because Russia exports to other States regardless of “alliance-status”

Their paragraph:

More Russian companies are looking to China to buy products. Historically these companies have bought material from Europe, but they have recently turned more to China because of how weak the Russian ruble is, making imports more expensive. At the same time, Chinese companies are looking to Russia as an export market as well as to Russia and former Soviet states as investment opportunities. There is synergy, for example, between a Chinese rocket company that sees a relatively cheap Ukrainian rocket company with specific technology that it wants and a Ukrainian company that has all the technology, intellectual property, and “know-how,” but does not have that much money.

#### 2] Private sector is not in the card. Part of it is about Chinese companies but doesn’t say they would develop “wish-lists”, it says the government would.

### Sino-Russia

#### Bowman and Thompson –

#### Unsure why the plan solves since their ev is only about anti-satellite weapons and says that ground-based weapons are important.

#### It’s also just a PSA about China and Russia pushing the United States to agree to faulty treaties – that still happens post plan, probably more, because China would want to close the US out of cheap avenues to space weaponry.

#### No Russia-China alliance AND the US doesn’t impact it.

Carafano 19 — (James Jay Carafano is Vice President for Foreign and Defense Policy at the Heritage Foundation, 8-5-2019, "Why the China-Russia Alliance Won't Last," National Interest, <https://nationalinterest.org/feature/why-china-russia-alliance-wont-last-71556>

So, now everybody wants to be Bismarck. They see themselves shaping history by artfully moving big pieces on the geostrategic chessboard. And one gambit they just can’t resist is moving to snip the growing bonds of Sino-Russian cooperation. My advice to them: Just stop. Fears of an allied China and Russia running amok around the world are overblown. Indeed, there is so much friction between these “friends,” any attempt to team up would likely give both countries heat [rash](https://nationalinterest.org/feature/why-china-russia-alliance-wont-last-71556). Siren’s Cat Call Here’s the lame narrative that’s animating the Bismarck wannabes: The United States is pushing back against Moscow and pressing Beijing. This is driving Moscow and Beijing closer together. Beijing and Moscow will then gang-up on the United States. To prevent this, the United States should make nice with Moscow (undermining the incipient Sino-Russian détente) and then focus on beating back against China. This is an idea that should be dumped into the dustbin before it has any [history](https://nationalinterest.org/feature/why-china-russia-alliance-wont-last-71556). Yes, China and Russia are going to work together to some degree. They have important things in common. For example, both are unaccountable authoritarian regimes that share the Eurasian continent. Other indicators of compatibility: they like doing business with each other, and both like to make up their own rules. Heck, they don’t even have to pretend the liberal world [order](https://nationalinterest.org/feature/why-china-russia-alliance-wont-last-71556) is a speed-bump in their joint ventures. Both happily engage with the world’s most odious regimes, from Syria to Venezuela. And, of course, neither has any compunction about playing dirty when it serves their interests. They already play off of each other to frustrate foreign-policy initiatives from Washington. For example, if the United States pressures Russia to vote a certain way on a measure before the UN Security Council, Russia will often don the white hat and vote as we desire, knowing that Beijing will veto the measure for them. Similarly, if the United States leans on Beijing stop giving North Korea some form of aid and comfort, Beijing can go along with the request, knowing that Moscow will pick up the baton for them. What the neo-Bismarcks need to ask themselves is: Why would Russia or China ever consider giving up these practices? Why would they make the ongoing great power competition easier for the United States? That makes no sense. That is not in their self-interest. Any notion that the United States could somehow seduce Russian president Vladimir Putin from playing house with Beijing is fanciful. Putin doesn’t do something for nothing; his price would be quite high. He could demand a free hand in Ukraine, or lifting sanctions, or squelching opposition to Nordstream II, or giving Russia free rein in the Middle East. Any of these “deals” would greatly compromise American interests. Why would we do that? And what, exactly, is Putin going to deliver in return? What leverage does Russia have on Beijing? The answer is not near enough to justify any of these concessions. On the other hand, what leverage would a Russia-China alliance have on the United States? They wouldn’t jointly threaten Washington with military action. A central element of both their strategies is that they [want to win](https://nationalinterest.org/feature/why-china-russia-alliance-wont-last-71556) against the United States “without fighting.” Moscow might be happy if the United States got distracted in a military mix-up with China. Conversely, Beijing could okay with the Americans have an armed confrontation with the Russians. But, neither of them will be volunteering to go first anytime soon. Even if they linked arms to threaten the United States in tandem, the pain would not be worth the gain. As long as America maintains [a credible global](https://www.heritage.org/military-strength/download-the-2019-index) and strategic deterrent, a Sino-Russian military one-two punch is pretty much checkmated. Peace through strength really works. If direct military confrontation is out of bounds, then what can Beijing and Moscow do using economic, political, and diplomatic power or tools of hybrid warfare? The answer to that question is easy: exactly what they are already doing. We have plenty of evidence of on-going political warfare aimed at the United States, its friends, allies, and interests. Some of these activities are conducted in tandem; some are instances of copy-catism; and some are independent and original. The political warfare takes many forms—ranging from [corrosive economic behavior](https://www.cipe.org/events/corrosive-capitals-threat-to-democracy-how-china-and-russia-undermine-rule-of-law-through-foreign-investment-and-development-strategies/) to [aggressive diplomacy](https://www.ned.org/wp-content/uploads/2017/12/Sharp-Power-Rising-Authoritarian-Influence-Full-Report.pdf) to [military expansionism](https://www.heritage.org/military-strength/assessing-threats-us-vital-interests/asia) and [more](https://www.iri.org/resource/new-report-exposes-chinas-malign-influence-and-corrosion-democracy-worldwide). All these malicious efforts are a problem. What they don’t add up to is an existential threat to vital U.S. interests. In other words, we can handle this without sucking up to Putin and undermining our own interests. In fact, we already have a [national-security strategy](https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf) that adequately addresses these concerns. One more thing inhibiting a Sino-Russian hookup. Russian and Chinese power is largely asymmetrical. They have very different strengths and weaknesses. In coordinating their malicious activities against the United States, they don’t line out very well. China, for example, can’t really do anything substantive to help Russia in Syria. Putin doesn’t have much to offer in the South China Seas or in brokering a U.S.-China trade agreement. **Strategic Friction** There are also limits to the Sino-Russia era of good feelings. Other than trying to take America down a notch, their global goals are not well aligned. Indeed, the more they try to cooperate, the more their disparate interests will grate on the relationship. For example, China is meddling more in Central Asia and the Arctic—spaces where Russia was dominant. Moscow has to ask itself: Why is Beijing elbowing in? There is an argument that rather than looking for a strategic partnership, China is just biding its time till Russia implodes, and Beijing steps in and [sweeps](https://nationalinterest.org/feature/why-china-russia-alliance-wont-last-71556) up the choice pieces. And, as much as Putin likes to tweak Trump about Moscow’s ties with Beijing, it is becoming more apparent to Washington that Russia is ever more the junior partner. Can Putin really continue to play Robin to a Chinese Batman? As for China, they have to ask: What does Robin really bring to the dynamic-duo? **Play the Long Great Power Game** The world doesn’t require a twenty-first century Bismarck. The United States will do better simply by continuing its strategy of pushing back on Russia and China, while letting them know there’s an off-ramp waiting for them if—and only if—they respect U.S. interests. Sure, this makes double duty for Washington. The United States has to mitigate Moscow’s efforts to destabilize Europe, even as it pushes for a free and open Indo-Pacific. But these tasks are not beyond our capabilities—and for us the pain is worth the gain. Rather than try to pry Putin and Xi Jinping apart, Trump should continue to squeeze them from both sides. The natural friction in the Russian and Chinese relationship will prevent them from effectively ganging up on the United States. And it wouldn’t hurt if the United States should find subtle ways to remind them that they would foolish to trust each other too much. The primary interest of both Putin and Xi is to assure the survival of their regimes. The American squeeze play will leave them with little choice but to accept the fact that America is strong, it’s here to stay, and their regimes have to live with it. This is the only kind of global balancing that will bring about stable relationships in the long-term.

#### No one’s going to war over a downed satellite

Bowen 18 [Bleddyn Bowen, Lecturer in International Relations at the University of Leicester. The Art of Space Deterrence. February 20, 2018. https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/]

Space is often an afterthought or a miscellaneous ancillary in the grand strategic views of top-level decision-makers. A president may not care that one satellite may be lost or go dark; it may cause panic and Twitter-based hysteria for the space community, of course. But the terrestrial context and consequences, as well as the political stakes and symbolism of any exchange of hostilities in space matters more. The political and media dimension can magnify or minimise the perceived consequences of losing specific satellites out of all proportion to their actual strategic effect.

#### Won’t go nuclear – seen as a normal conventional attack because of integration with ground forces

Firth 7/1/19 [News Editor at MIT Technology Review, was Chief News Editor at New Scientist. How to fight a war in space (and get away with it). July 1, 2019. MIT Technology Review]

Space is so intrinsic to how advanced militaries fight on the ground that an attack on a satellite need no longer signal the opening shot in a nuclear apocalypse. As a result, “deterrence in space is less certain than it was during the Cold War,” says Todd Harrison, who heads the Aerospace Security Project at CSIS, a think tank in Washington, DC. Non-state actors, as well as more minor powers like North Korea and Iran, are also gaining access to weapons that can bloody the noses of much larger nations in space.

#### Alt Cause - Pursuit of dominance leads to Sino-Russia alliance

**Porter, DPhil, 19**

(Patrick, ModernHistory@Oxford, ProfInternationalSecurityAndStrategy@Birmingham, Advice for a Dark Age: Managing Great Power Competition, The Washington Quarterly, 42:1, 7-25)

Even the United States cannot prudently take on every adversary on multiple fronts. The costs of military campaigns against these adversaries in their backyards, whether in the Baltic States or Taiwan, would outstrip the losses that the U.S. military has sustained in decades. Short of all-out conflict, to mobilize for dominance and **risk escalation on multiple such fronts** would court several dangers. It would **overstretch the country**. The U.S. defense budget now approaches $800 billion annually, not including deficit-financed military operations. This is a time of ballooning deficits, where the Congressional Budget Office warns that “the prospect of large and growing debt poses substantial risks for the nation.”27 If in such conditions, current expenditure is not enough to buy unchallengeable military preponderance—and it may not be—then the failure lies not in the failure to spend even more. Neither is the answer to sacrifice the quality of civic life at home to service the cause of preponderance abroad. The old “two war standard,” a planning construct whereby the United States configures its forces to conduct two regional conflicts at once, would be unsustainably demanding against more than one peer competitor, or potentially with a roster of major and minor adversaries all at once.28 After all, the purpose of American military power is ultimately to secure a way of life as a constitutional republic. To impose ever-greater debts on civil society and strip back collective provision at home, on the basis that the quality of life is expendable for the cause of hegemony, is perversely to set up power-projection abroad as the end, when it should be the means. The problem lies, rather, in **the inflexible pursuit of hegemony itself**, and the **failure to balance commitments** with scarce resources. To attempt to suppress every adversary simultaneously would **drive adversaries together, creating hostile coalitions**. It also may not succeed. Counterproliferation in North Korea is difficult enough, for instance, but the task becomes more difficult still if U.S. enmity with China drives Beijing to refuse cooperation over enforcing sanctions on Pyongyang. Concurrent competitions would also split American resources, attention and time. Exacerbating the strain on scarce resources between defense, consumption and investment raises the polarizing question of whether preponderance is even worth it, which then undermines the domestic consensus needed to support it. At the same time, reduced investment in infrastructure and education would damage the economic foundations for conducting competition abroad in the first place. Taken together, indiscriminate competition risks creating the thing most feared in traditional U.S. grand strategy: **a hostile Eurasian alliance** leading to continuous U.S. mobilization against hostile coalitions, turning the U.S. republic into an illiberal garrison state. If the prospect for the United States as a great power faces a problem, it is not the size of the defense budget, or the material weight of resources at the U.S. disposal, or popular reluctance to exercise leadership. Rather, the problem lies in the scope of the policy that those capabilities are designed to serve. To make the problem smaller, Washington should take steps to make the pool of adversaries smaller.

#### No IL - Space wars don’t cause escalation

James Pavur 19, Professor of Computer Science Department of Computer Science at Oxford University and Ivan Martinovic, DPhil Researcher Cybersecurity Centre for Doctoral Training at Oxford University, “The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space”, 2019 11th International Conference on Cyber Conflict: Silent Battle T. Minárik, S. Alatalu, S. Biondi, M. Signoretti, I. Tolga, G. Visky (Eds.), <https://ccdcoe.org/uploads/2019/06/Art_12_The-Cyber-ASAT.pdf>

A. Limited Accessibility Space is difficult. Over 60 years have passed since the first Sputnik launch and only nine countries (ten including the EU) have orbital launch capabilities. Moreover, a launch programme alone does not guarantee the resources and precision required to operate a meaningful ASAT capability. Given this, one possible reason why space wars have not broken out is simply because only the US has ever had the ability to fight one [21, p. 402], [22, pp. 419–420]. Although launch technology may become cheaper and easier, it is unclear to what extent these advances will be distributed among presently non-spacefaring nations. Limited access to orbit necessarily reduces the scenarios which could plausibly escalate to ASAT usage. Only major conflicts between the handful of states with ‘space club’ membership could be considered possible flashpoints. Even then, the fragility of an attacker’s own space assets creates de-escalatory pressures due to the deterrent effect of retaliation. Since the earliest days of the space race, dominant powers have recognized this dynamic and demonstrated an inclination towards de-escalatory space strategies [23]. B. Attributable Norms There also exists a long-standing normative framework favouring the peaceful use of space. The effectiveness of this regime, centred around the Outer Space Treaty (OST), is highly contentious and many have pointed out its serious legal and political shortcomings [24]–[26]. Nevertheless, this status quo framework has somehow supported over six decades of relative peace in orbit. Over these six decades, norms have become deeply ingrained into the way states describe and perceive space weaponization. This de facto codification was dramatically demonstrated in 2005 when the US found itself on the short end of a 160-1 UN vote after opposing a non-binding resolution on space weaponization. Although states have occasionally pushed the boundaries of these norms, this has typically occurred through incremental legal re-interpretation rather than outright opposition [27]. Even the most notable incidents, such as the 2007-2008 US and Chinese ASAT demonstrations, were couched in rhetoric from both the norm violators and defenders, depicting space as a peaceful global commons [27, p. 56]. Altogether, this suggests that states perceive real costs to breaking this normative tradition and may even moderate their behaviours accordingly. One further factor supporting this norms regime is the high degree of attributability surrounding ASAT weapons. For kinetic ASAT technology, plausible deniability and stealth are essentially impossible. The literally explosive act of launching a rocket cannot evade detection and, if used offensively, retaliation. This imposes high diplomatic costs on ASAT usage and testing, particularly during peacetime. C. Environmental Interdependence A third stabilizing force relates to the orbital debris consequences of ASATs. China’s 2007 ASAT demonstration was the largest debris-generating event in history, as the targeted satellite dissipated into thousands of dangerous debris particles [28, p. 4]. Since debris particles are indiscriminate and unpredictable, they often threaten the attacker’s own space assets [22, p. 420]. This is compounded by Kessler syndrome, a phenomenon whereby orbital debris ‘breeds’ as large pieces of debris collide and disintegrate. As space debris remains in orbit for hundreds of years, the cascade effect of an ASAT attack can constrain the attacker’s long-term use of space [29, pp. 295– 296]. Any state with kinetic ASAT capabilities will likely also operate satellites of its own, and they are necessarily exposed to this collateral damage threat. Space debris thus acts as a strong strategic deterrent to ASAT usage.

#### Turn - Loss of satellites will shut down terrestrial mining

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Resource Location

Looking for rare minerals to be mined for our many gadgets, household appliances, and industrial machines? Soil type is often a strong indicator of whether or not underground deposits of metals and minerals are located. By using satellite data to identify promising surface structural features and different soil types, mining companies can better identify promising mining locations, wasting less time and effort in finding the best places to obtain much-needed industrial resources. Without satellite images, the finding and assessment of promising new mines would grind to a halt as the industries retooled back into the days of much slower and labor-intensive field surveys (but without GPS!).

#### Amazon mining will cause extinction

Charito Ushiñahua 11, Anthropologist Working for the Preservation of Indigenous Amazonian Cultures, “Yanomami Indians: The Fierce People?”, http://www.amazon-indians.org/yanomami.html

A mineralogical survey of the northern Amazon by the Brazilian government in 1975 revealed the presence of gold ore in the Roraima region of Brazil. By the early 1980's, miners in search of gold began invading the Yanomami territory in Brazil and by 1987 it had become a full-fledged gold rush. Over 30,000 prospectors entered Yanomami lands and established over a hundred clandestine mining operations. The resulting massacres and diseases brought by these invaders is estimated to have caused the death of over 2,000 Yanomami. One of the problems with gold mining is the environmental destruction it causes. In order to separate gold from rocks and soil, mercury is used. Mercury in the rivers and streams bio-accumulates and permeates the entire ecosystem. The mercury accumulates in predators and hunters (such as the Yanomami) higher up the food chain and creates a neurotoxin that causes birth defects and abnormal child development. The Yanomami have had increased child mortality rates while their birth rates have declined putting their very existence into risk. Moreover, malaria increased in the area due to the stagnant pools left by the miners that increase the mosquito populations that are vectors of the disease. Some have estimated that malaria is responsible for the deaths of about 13% of the Yanomami population every year. However, the negative influence of the miners extends beyond physical health. Their introduction of alcohol and other western goods has had an immense negative effect on Yanomami society itself.

In response to the crisis created by the gold miners, in 1992 the Yanomami territory was protected by the Brazilian government by creating a federal indigenous reserve. However, the gold miners were not happy about the creation of the reserve and in July, 1993, a group of miners tried to exterminate an entire village in what has become to be known as the "Haximu Massacre." At lease 16 Yanomami were killed in what many have called genocide. Some of the miners were tried and convicted and after numerous appeals on the 7th of August, 2006 the Brazilian Supreme Federal Court reaffirmed that the crime known as the Haximu Massacre and upheld the ruling sentencing the miners to 19 years in prison for genocide. However, to this day there is political pressure by the mining industry to reduce the Yanomami territory and allow commercial mining operations on their lands.

In the year 2000, a journalist named Patrick Tierney published a book called, "Darkness in El Dorado," and accused anthropologist Napoleon Chagnon and his colleague geneticist James Neel of numerous misdeeds, among them intentionally creating an epidemic of measles among the Yanomami people in order to study the effects of natural selection on primitive societies. Tierney states that the resulting epidemic caused the death of hundreds of Yanomami. Incredibly, Tierney charged that the experiments were funded by the US Atomic Energy Commission, who sought to model the societal consequences of mass mortality caused by nuclear war. In addition to the measles epidemic, Tierney charged that Chagnon mischaracterized the Yanomami as "The Fierce People" when in fact it was Chagnon who was causing the violence by introducing enormous amounts of western goods such as machetes into the Yanomami society, thus stimulating warfare over the introduced goods. Tierney also accused Chagnon of fraud by staging films, such as "The Axe Fight" that he helped produce. The journalist charged that the anthropologist prescripted the films and that they were not spontaneous as portrayed.

Tierney's book caused an uproar in the anthropological community and the American Anthropological Association (AAA) got involved in the debate. In fact, the AAA convened a special commission to investigate the allegations against Chagnon and Neel. The report by the AAA issued in May, 2002 exonerated the anthropologist and geneticist from causing a measles epidemic among the Yanomami. Nonetheless, the AAA criticized some aspects of Chagnon's research, including his portrayal of the Yanomami as "The Fierce People," and his bribing of Venezuelan officials. However, the AAA debate was not over and three years later in June, 2005 they rescinded the acceptance of the 2002 report.

As someone who is working to support indigenous people, I would like to point out that over the many years since publishing his first book on the Yanomami (whose revenues made him a millionaire), Chagnon has failed to bring significant aid to the Yanomami people. In fact, he sought to damage the indigenous movement by publicly criticizing Davi Kopenawa, a Yanomami activist who helped establish the Yanomami reserve in Brazil. One might ask if it was proper behavior for an anthropologist to hurt the efforts of an indigenous Amazonian activist attempting to defend his people. Interestingly, the Yanomami leader Davi Kopenawa has predicted the destruction of the entire human race if the Amazon Rainforest is destroyed. Kopenawa states, "The forest-land will only die if it is destroyed by whites. Then, the creeks will disappear, the land will crumble, the trees will dry and the stones of the mountains will shatter under the heat. The xapiripë spirits who live in the mountain ranges and play in the forest will eventually flee. Their fathers, the shamans, will not be able to summon them to protect us. The forest-land will become dry and empty. The shamans will no longer be able to deter the smoke-epidemics and the malefic beings who make us ill. And so everyone will die." Many ecologists seem to agree with Kopenawa, believing that the Amazon Rainforest are the "lungs of the Earth" and that if the Amazon is destroyed, it will cause a global ecological disaster resulting in the eventual destruction of the human race.

#### Turn - Satellites are crucial for large, industrial megafarms

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Agriculture

To feed the Earth's growing population affordably, farming has gone from a mostly decentralized, family-owned business to corporate farming on a scale never before imagined. These industrial megafarms are a primary reason that many people in the world can enjoy plentiful and varied foods at a reasonable cost. On this scale, deciding what crop to plant in a given field is not just business - it's science. And the science relies, in large part, on data from space.

Companies such as the Satellite Imaging Corporation (SIC) provide data from space on overall crop health, soil analysis, and irrigation impacts and efficiencies. From space, you can easily map soil variations, finding areas rich in organic matter and others less so - this allows optimized planting to take advantage of crops that thrive in any given soil environment. Very large farms also use satellite images to assess the overall health of their crops by land area, spotting those that are being impacted by non-optimal soil moisture content, etc., allowing the farmer to take corrective action while there is still time to save the crop.

#### Industrial ag’s unsustainable and causes extinction

Alice Friedemann 17, Systems Architect and Engineer For Over 25 Years, Science, Energy, and Agriculture Writer, Investigative Journalist and Energy Expert, Founder of Energy Skeptic, Author of When Trucks Stop Running: Energy and the Future of Transportation, “Chemical Industrial Agriculture is Unsustainable. Here’s Why”, Resilience, 5-27, http://www.resilience.org/stories/2017-03-27/chemical-industrial-farming-unsustainable-heres/

We hear a lot about how we’re running out of antibiotics. But we are also doomed to run out of pesticides, because insects inevitably develop resistance, whether toxic chemicals are sprayed directly or genetically engineered into the plants.

Worse yet, weeds, insects, and fungus develop resistance in just 5 years on average, which has caused the chemicals to grow increasingly lethal over the past 60 years. And it takes on average eight to ten years to identify, test, and develop a new pesticide, though that isn’t long enough to discover the long-term toxicity to humans and other organisms.

And this devil’s bargain hasn’t even provided most of the gains in crop yields, which is due to natural-gas and phosphate fertilizers plus soil-crushing tractors and harvesters that can do the work of millions of men and horses quickly on farms that grow only one crop on thousands of acres.

Yet before pesticides, farmers lost a third of their crops to pests, after pesticides, farmers still lose a third of their crops.

Even without pesticides, industrial agriculture is doomed to fail from extremely high rates of soil erosion and soil compaction at rates that far exceed losses in the past, since soil couldn’t wash or blow away as easily on small farms that grew many crops.

But pest killing chemicals are surely accelerating the day of reckoning sooner rather than later. Enormous amounts of toxic chemicals are dumped on land every year — over 1 billion pounds are used in the United State (US) every year and 5.6 billion pounds globally (Alavanja 2009).

This destroys the very ecosystems that used to help plants fight off pests, and is a major factor biodiversity loss and extinction.

Evidence also points to pesticides playing a key role in the loss of bees and their pollination services. Although paleo-diet fanatics won’t mind eating mostly meat when fruit, vegetable, and nut crops are gone, they will not be so happy about having to eat more carbohydrates. Wheat and other grains will still be around, since they are wind-pollinated.

Agricultural chemicals render land lifeless and toxic to beneficial creatures, also killing the food chain above — fish, amphibians, birds, and humans (from cancer, chronic disease, and suicide).

Surely a day is coming when pesticides stop working, resulting in massive famines. But who is there to speak for the grandchildren? And those that do speak for them are mowed down by the logic of libertarian capitalism, which only cares about profits today. Given that a political party is now in power in the U.S. that wants to get rid of the protections the Environmental Protection Agency (EPA) and other agencies provide, may make matters worse if agricultural chemicals are allowed to be more toxic, long-lasting, and released earlier, before being fully tested for health effects.

Meanwhile chemical and genetic engineering companies are making a fortune, because the farmers have to pay full price, since the pests develop resistance long before a product is old enough to be made generically. Except for glyphosate, but weeds have developed resistance. Predictably.

In fact, the inevitability of resistance has been known for nearly seven decades. In 1951, as the world began using synthetic chemicals, Dr. Reginald Painter at Kansas State University published “Insect Resistance in Crop Plants”. He made a case that it would be better to understand how a crop plant fought off insects, since it was inevitable that insects would develop genetic or behavioral resistance. At best, chemicals might be used as an emergency control measure.

Farmers will say that we simply must carry on like this, there’s no other choice. But that’s simply not true.

Consider the corn rootworm, that costs farmers about $2 billion a year in lost crops despite spending hundreds of millions on chemicals and the hundreds of millions of dollars chemical companies spend developing new chemicals.

To lower the chances of corn pests developing resistance, corn crops were rotated with soybeans. Predictably, a few mutated to eat soybeans plus changed their behavior. They used to only lay eggs on nearby corn plants, now they disperse to lay eggs on soybean crops as well. Worse yet, corn is more profitable than soy and many farmers began growing continuous corn. Already the corn rootworm is developing resistance to the latest and greatest chemicals.

But the corn rootworm is not causing devastation in Europe, because farms are smaller and most farmers rotate not just soy, but wheat, alfalfa, sorghum and oats with corn (Nordhaus 2017).

Before planting, farmers try to get rid of pests that survived the winter and apply fumigants to kill fungi and nematodes, and pre-emergent chemicals to reduce weed seeds from emerging. Even farmers practicing no-till farming douse the land with herbicides by using GMO herbicide-resistant crops. Then over the course of crop growth, farmers may apply several rounds of additional pesticides to control different pests. For example, cotton growers apply chemicals from 12 to 30 times before harvest.

Currently, the potential harm is only assessed for 2 to 3 years before a permit is issued, even though the damage might occur up to 20 years later.

Although these chemicals appear to be just like antibiotics, that isn’t entirely true. We develop some immunity to a disease after antibiotics help us recover, but a plant is still vulnerable to the pests and weeds with the genetics or behavior to survive and chemical assault.

Although there are thousands of chemical toxins, what matters is how they kill, their method of action (MOA). For herbicides there are only 29 MOAs, for insecticides, just 28. So if a pest develops resistance to one chemical within an MOA, it will be resistant to all of the thousands of chemicals within that MOA.

The demand for chemicals has also grown due the high level of bioinvasive species. It takes a while to find native pests and make sure they won’t do more harm than good. In the 1950s there were just three main corn pests. By 1978 there were 40, and they vary regionally. For example, California has 30 arthropods and over 14 fungal diseases to cope with.

When I was learning how to grow food organically back in the 90s, I remember how outraged organic farmers were that Monsanto was going to genetically engineer plants to have the Bt bacteria in them. This is because the only insecticide organic farmers can use is Bt bacteria, because it is found in the soil. It’s natural. Organic farmers have been careful to spray only in emergencies so that insects didn’t develop resistance to their only remedy. Since 1996, GMO plants have been engineered to have Bt in them, and predictably, insects have developed resistance. For example, in 2015, 81% of all corn was planted with genetically engineered Bt. But corn earworms have developed resistance, especially in North Carolina and Georgia, setting the stage for damage across the nation. Five other insects have developed resistance to Bt as well.

GMO plants were also going to reduce pesticide use. They did for a while, but not for long. Chemical use has increased 7% to 202,000 tons a year in the past 10 years.

Resistance can come in other ways than mutations. Behavior can change. Cockroach bait is laced with glucose, so cockroaches that developed glucose-aversion now no longer take the bait.

It is worth repeating that chemicals and other practices are ruining the long-term viability of agriculture. Here is how author Dyer explains it:

“Ultimately the practice of modern farming is not sustainable” because “the damage to the soil and natural ecosystems is so great that farming becomes dependent not on the land but on the artificial inputs into the process, such as fertilizers and pesticides. In many ways, our battle against the diverse array of pest species is a battle against the health of the system itself. As we kill pest species, we also kill related species that may be beneficial. We kill predators that could assist our efforts. We reduce the ecosystem’s ability to recover due to reduced diversity, and we interfere with the organisms that affect the biogeochemical processes that maintain the soils in which the plants grow.

Soil is a complex, multifaceted living thing that is far more than the sum of the sand, silt, clay, fungi, microbes, nematodes, and other invertebrates. All biotic components interact as an ecosystem within the soil and at the surface, and in relation to the larger components such as herbivores that move across the land. Organisms grow and dig through the soil, aerate it, reorganize it, and add and subtract organic material. Mature soil is structured and layered and, very importantly, it remains in place. Plowing of the soil turns everything upside down. What was hidden from light is exposed. What was kept at a constant temperature is now varying with the day and night and seasons. What cannot tolerate drying conditions at the surface is likely killed. And very sensitive and delicate structures within the soil are disrupted and destroyed.

Conventional tillage disrupts the entire soil ecosystem

. Tractors and farm equipment are large and heavy; they compact the soil, which removes air space and water-holding capacity. Wind and water erosion remove the smallest soil particles, which typically hold most of the micronutrients needed by plants. Synthetic fertilizers are added to supplement the loss of oil nutrients but often are relatively toxic to many soil organisms. And chemicals such as pre-emergents, fumigants, herbicides, insecticides, acaricides, fungicides, and defoliants eventually kill all but the most tolerant or resistant soil organisms. It does not take long to reduce a native, living, dynamic soil to a relatively lifeless collection of inorganic particles with little of the natural structure and function of undisturbed soil”.

When I told my husband all the reasons we use agricultural chemicals and the harm done, my husband got angry and said “Farmers aren’t stupid, that can’t be right!”

I think there are a number of reasons why farmers don’t go back to sustainable organic farming.

First, there is far too much money to be made in the chemical herbicide, pesticide, and insecticide industry to stop this juggernaut. After reading Lessig’s book “Republic, Lost”, one of the best, if not the best book on campaign finance reform, I despair of campaign financing ever happening. So chemical lobbyists will continue to donate enough money to politicians to maintain the status quo. Plus the chemical industry has infiltrated regulatory agencies via the revolving door for decades and is now in a position to assassinate the EPA, with newly appointed Scott Pruitt, who would like to get rid of the EPA.

Second, about half of farmers are hired guns. They don’t own the land and care about passing it on in good health to their children. They rent the land, and their goal, and the owner’s goal is for them to make as much profit as possible.

Third, renters and farmers both would lose money, maybe go out of business in the years it would take to convert an industrial monoculture farm to multiple crops rotated, or an organic farm.

Fourth, it takes time to learn to farm organically properly. So even if the farmer survives financially, mistakes will be made. Hopefully made up for by the higher price of organic food, but as wealth grows increasingly more unevenly distributed, and the risk of another economic crash grows (not to mention lack of reforms, being in more debt now than 2008, etc).

Fifth, industrial farming is what is taught at most universities. There are only a handful of universities that offer programs in organic agriculture.

Sixth, subsidies favor large farmers, who are also the only farmers who have the money to profit from economies of scale, and buy their own giant tractors to farm a thousand acres of monoculture crops. Industrial farming has driven 5 million farmers off the land who couldn’t compete with the profits made by larger farms in the area.

But farmers will have to go organic whether they like it or not

It’s hard to say whether this will happen because we’ve run out of pesticides, whether from resistance or a financial crash reducing new chemical research, or whether peak oil, peak coal, and peak natural gas will cause the decline of chemical farming. Agriculture uses about 15 to 20% of fossil fuel energy, from natural gas fertilizer, oil-based chemicals, farm vehicle and equipment fuel, the agricultural cold chain, distribution, packaging, refrigeration, and cooking to name a few of the uses.

At some point of fossil decline, there won’t be enough fuel or pesticides to continue business as usual.

Farmers will be forced to go organic at some point. Wouldn’t it be easier to start the transition now?