

The New Space Race

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“The Future of Geography: How Power and Politics in Space will change our world”,
Tim Marshall, Elliot & Thompson, GBP 14.99 (2023).

On 24th February, 2022, Russia invaded Ukraine. With armored columns marching from the East and North and missile attacks on major urban centers in Ukraine, the Russian Army seemed well on its way to capture major parts of Ukraine. Apart from the asymmetry in men and materiel, a major drawback for Ukraine was lack of a secure and reliable communication network to coordinate between its defense forces since the traditional channels were either destroyed or jammed by the Russians.

That was until an appeal was made to Elon Musk asking for help. Musk’s company Starlink runs a low earth orbit satellite constellation which can provide high-speed internet anywhere on the globe. Within a couple of days, Starlink terminals had been shipped to Ukraine and within a few weeks, the Ukrainian army had access to a secure communication system. The Russians tried to jam and disrupt the system but a software update to the system prevented the jamming. Thousands of Starlink terminals are still operating in Ukraine and are being used both for military and civilian purposes.

The use of satellite communication in Ukraine is only the latest example of how critical dominance in space is now to a nation’s defensive and offensive strategy. Tim Marshall’s new book explores how a country’s capabilities in space technology will determine its place in the pecking order of nations. “Astropolitics” or power politics in space will be as important as geopolitics is on the ground.

Marshall starts with a hyper-condensed version of the history of humankind’s exploration of the cosmos- from the Late Paleolithic period to the dawn of relativity and quantum mechanics. The empirical observations of the ancient Greeks, the dominance of Ptolmey’s Almagest in understanding the cosmos for over a millennia, Galileo, Newton and even the Hubble Space telescope are all discussed in a few pages. This potted history is necessarily very selective but seems largely irrelevant to his later arguments.

Human beings have always been fascinated by space. The invention of gunpowder by the Chinese in the ninth century was a watershed moment since the basic principle behind a Divali rocket and the Space Shuttle is essentially the same. A propellant is set on fire and hot gases shoot out from the exhaust at the back propelling the rocket up. The difference lies in the scale and sophistication of technology which can carry the rocket into space. Interestingly, space is confusingly defined differently by different organisations- NASA defines space as beginning 80 km above mean sea level while the more widely used definition is the Karman line which is 100 km above the earth.

The first person to demonstrate the theoretical possibility of spaceflight was a self-taught Russian, Konstantin Tsiolkovsky in 1903. Robert Goddard in the USA and Hermann Oberth in Germany were among the others who contributed to various aspects of rocket technology. The practical development of rocket engines however had to wait till the 1940s when a Prussian aristocrat Wernher von Braun developed the infamous V-2 rockets for the Nazis. Hitler used these to wreak havoc on Allied cities. It was another matter that the rockets were built by slave labor in concentration camps.

Both the Soviets and the Americans realized the vast military potential of this technology. And so, after the war, both wanted to get their hands on it. Von Braun surrendered to the Americans who took him, along with about a hundred other German scientists to the US to develop ballistic missiles. His past crimes were whitewashed from all records and to top it all, he was made the director of the Marshall Space Flight Center in the USA. The Russians too took away many scientists and also got the production facilities for the rockets. The Cold War and with it a nasty arms race had begun with each side trying to be the first to develop more and more destructive weapons and delivery systems.

On October 4th, 1957, the Soviets launched the artificial satellite Sputnik 1. The Americans were aghast since they realized that the same technology that could launch the Sputnik could also be used to target their continent which hitherto they had assumed was safe. A few weeks later, the Soviets launched Sputnik 2 which carried a dog named Laika into space. It was not until January 1958 that the Americans, after a botched attempt, managed to launch the Explorer I into orbit. The Space Race had now begun.

In 1961 Yuri Gagarin became the first man to go into space. Now the Americans were truly amazed- how could a communist country be so advanced technologically to put a man in space before them? President Kennedy declared that the Americans would land on the Moon before the decade was over. The Apollo program which cost a staggering 2.5% of the GDP annually over a decade, was launched and Neil Armstrong landed on the Moon in 1969.

The development of space technology, both for civilian and military purposes accelerated in the subsequent decades. The Space Station, the Space Shuttle, exploratory space crafts to the far reaches of the solar system were all made possible during the next few decades. Tens of thousands of satellites were launched into low-earth and geosynchronous orbits. Everything from remote sensing to weather prediction, from military communications to reconnaissance, from guiding missiles to GPS which enables you to reach your destination, is made possible with the use of satellites.

The space program from its very inception was inextricably linked with military applications. Since satellites are so vital, it is almost axiomatic that technology to destroy or disable them would also be concurrently developed. Indeed, Anti-Satellite weapons have been developed and tested by several countries over the years.

Limited access to certain vital materials like rare earths is also prompting several countries to explore the possibility of mining them from the Moon and asteroids. This has prompted a new Space Race to colonize other worlds. In recent times, the entry of private players like Elon Musk's Space-X and Jeff Bezos' Blue Origin among others has added a new dimension to space exploration.

Marshall explores all these aspects of the space endeavor in his book. His central thesis is this: just like in the past, access to military hardware as well as resources was central to geopolitics, space will be the new arena for competition among nations. On earth, human beings learnt from the destructive effects of conflict among nations by developing institutions and formulating laws to moderate the ill effects of competition among nations. We need a similar set of laws for astropolitics. The window for developing these is short given the pace of technological advancement.

Although he touches upon most aspects of astropolitics as it plays out today and plausibly in the future, his treatment remains very superficial and unsatisfying. Thus, though the book rightly focuses on the big space powers namely the US, Russia and

now China, it does not do justice to the smaller but important players like India and Japan. The omission of any detailed assessment of the Indian space program (it merits less than a couple of pages in the book) is particularly odd since our space program has made remarkable civilian and military advances in the last few decades.

The perfunctory way in which several important topics are discussed as well as the racy style of writing with anecdotes and interesting though useless detail, is more suitable to a magazine article than a serious exploration of a topic of such vital importance. There is a proliferation of detail which might make for great conversation at a party but does not add anything to our understanding. Thus, we learn that Yuri Gagarin urinated on the rear wheel of his car before climbing into the capsule that would take him into space and this tradition is still observed as a superstition among Russian cosmonauts. Or that the US authorities gave a special waiver to an astronaut since he was in space on the last day of filing tax returns. Or that the astronauts who landed on the Moon during the various Apollo missions left behind 100 bags of urine and excrement on the Moon.

The book, though short on detail and analysis does raise an important point- space is a jungle. The metaphor is apt in more ways than one. It took human societies several millennia to go from the law of the jungle to a world governed by mutually agreed laws. One just hopes that humanity doesn't have to wait that long for laws of astropolitics to be agreed upon so that conflict over scarce resources and human greed can be avoided. If we collectively do not agree for some kind of order in space soon, the consequences will be infinitely more disastrous than what human beings suffered in the past. We simply do not have the luxury to wait like our ancestors did.

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