GEOPOLITICS TO GEO-ECONOMICS TO… THE NEW ERA OF GEO-TECHNOLOGY

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By

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Historical Retrospect

Geopolitics has a very peculiar history. As a concept, it was born in the late Nineteenth Century in Germany and disappeared from the academic radar after the Second World War, possibly for not giving credit to Germany for its origin, as everything related to Germany during the Nazi period was being castigated. The word “geopolitics” was rarely ever used during the Cold War, till it resurfaced in the 1970s, with Henry Kissinger, the United States Secretary of State bringing it back.

German Geopolitics

Geopolitics encompasses two disciplines—geography and politics. Most early theories and concepts of geopolitics grew out of geographical thought. Geography is the precursor to political geography. Geography as a discipline has many branches and political geography is one of these, which was prevalent until the formal introduction of the term “geopolitics” in 1899. The German geographer ***Friedrich Ratzel*** in his seminal works *“Politische Geographie”* (Political Geography) (1897) and “Laws on the Spatial Growth of States” (1896) laid the solid foundation for “geopolitik”. Ratzel equated the state as a biological organism – territory being its body and propounded that states behaved and lived in accordance with biological laws. According to him, the state has its “roots” in the land and therefore grows in accordance with the nature of its territory and location. Regarding every state as a living organism, growth is the inherent nature of every state and a growing state would tend to absorb less successful and smaller states. Ratzel measured the

growth of the state by its expansion and considered that expansion and political growth is healthy for a state since it enhances its strength[1].

Since the total amount of space in the world is limited, the size of the earth's surface places limits on political expansion, the "zenith" could be reached by only a few states at the same time.[2] Ratzel's second important legacy is the concept of ***Lebensraum***. Literally translated, ***Lebensraum*** means "living space",('Leben' means living and 'Raum' means open space) but when interpreted by anyone in Germany it involves everything necessary for guaranteeing the life and development of the German people – physically, politically, and economically. It encompasses all kinds of issues based upon prestige, historical, and geographical considerations.[3]

Ratzel established the primacy of Germany and its need and right for a lebensraum and laid the scientific and theoretical foundation for the same, thereby paved the way for a "geopolitical science".[4]

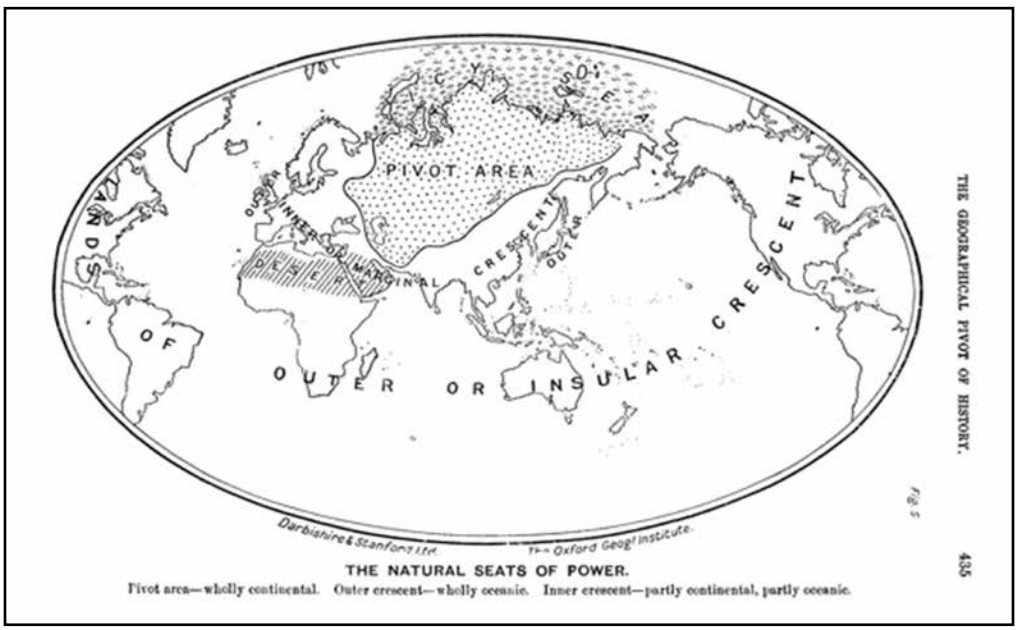
Rudolf Kjellen, a Swedish citizen but Ratzel's student, is credited with coinage of the term "Geopolitics" in 1899, defining it as "the theory of the state as a geographical organism or phenomenon in space". This definition contains two elements that are crucial within the concept of geopolitics: power (influence, politics) and space (territory, soil).[5] Kjellan theorized that states need to have five complementary attributes in order to be powerful, of which Geopolitik was the first and it involved the 'territory of the state'. The other attributes were, Demopolitik (the population of the state), Ekopolitik (the economic structure of the state), Sociopolitik (Social politics) and Kratopolitik (governmental – constitutional politics).[6] He propounded that the feet of geopolitics are literally on earth and geopolitics is not legalistic or idealistic, but realistic. Carrying forward the legacy of Ratzel's organic state theory, Kjellen considered states as biological and geographic organisms. His *Staten som Lifestrom* (The State as a Life-Form) published in 1916 was translated in to German as *Der Staat als Lebensform* one year later; was widely read in Germany and provided a deeper ideological basis to "geopolitik". Kjellen laid great

emphasis on culture, advocating that the more vigorous and "advanced" the culture, the more right it had to expand its domain or control more territory. According to him, it was only natural for advanced cultures to expand in to the territory of others. Thus borders were not set in stone, but malleable: an aspiration or an attempt to legitimize state expansion.[7]

The legacy of Ratzel and Kjellen was carried forward by Karl Haushofer, who took geopolitics to its pinnacle. Thus the credit for creating the field of geopolitics mostly goes to Germans but it was British political geographer and politician ***Sir Halford J. Mackinder*** (1861-1947), who through his speeches and writings was trying to educate the Britishers about the new geopolitical realities but inadvertently inspired the German thinkers to build upon his theories – same way as the teachings of British military theorist and proponent of maneuver warfare, Captain Sir Basil Liddell Hart were immediately grasped by German Generals, who practised it vigorously and ran over the Allied forces through their now famous Blitzkreig at the launch of the Second World War. Mackinder's prediction of the ascendancy of land power was not particularly welcomed in his own country whose navy had ruled the waves for several centuries.[8]

Though Mackinder himself never used the word but he established modern geopolitical imagination and visualization. He established geography as a university discipline in Britain and his main concern was safeguarding the British Empire's political, commercial, and industrial primacy at a time when command of the seas no longer appeared to guarantee world supremacy. With the arrival of the transcontinental railroad age, Mackinder viewed the rise of Eurasian continental states as the greatest threat to British world hegemony. Mackinder reasoned that land powers were in the advantage due to the advent of railways as this technological development made it possible to open up and use the rich resources of the world's largest landmasses. For Mackinder, geographical realities lay in the advantages of centrality of place and efficient movement of ideas, goods, and people.[9]

Mackinder presented his famous Heartland theory before the Royal Geographical Society on 25 January 1904, in an address titled "The Geographical Pivot of History". In this he theorized that the vast area of Euro-Asia (the great Eurasian lowland), characterized by interior or polar drainage and inaccessible to sea power, was the "pivot region" of world politics, which was about to be covered with a network of railways (See Figure 1). He warned that rule of the heart of the world's greatest landmass could become the basis for world domination owing to the superiority of rail over ships in terms of time and reach. A Eurasian land power (be it Russia or Germany, and especially an alliance of the two) that gained control of the pivot region would outflank the maritime world.[10] Eleven years later, the English geographer James Fairgrieve, who introduced the term "heartland," opined that China was in an excellent position to dominate Eurasia.[11]



(Outside the pivot area, in a great inner crescent, are Germany, Austria, Turkey, India, and China, and in an outer crescent, Britain, South Africa, Australia, the United States, Canada, and Japan.)

Figure 1: Sir Halford Mackinder's Pivot area (Source: Mackinder, 1904: 435)

Later in “Democratic Ideals and Realities” (1919), Mackinder, used the term “heartland” and taking into account advances in land transportation, population increases, and industrialization, enlarged his map to include Eastern Europe from the Baltic through the Black Seas Inner Eurasia’s strategic annex (See Figure 2).

Figure 2: Sir Halford Mackinder’s Heartland, including
Eastern Europe and parts of Central Europe (Source: Mackinder, 1919: 135)

This became the basis for his dictum,

"Who rules the Eastern Europe commands the Heartland;
Who rules the Heartland commands the World-Island;
Who rules the World-Island commands the World."[12]

Mackinder wrote at a time when both Russia and Germany were growing powers and because of their geographical locations, had the natural capability to command the Heartland by uniting their peoples. Mackinder's concern was due to rise of United Germany and with railways developing, it had access to East Europe thus enabling it to control the Heartland and in turn commanding the World Island. Mackinder referred to the combined Eurasian and African landmasses as World Island.[13] Mackinder proposed creation of a buffer zone based on nationality, consisting of a number of independent states to check the German and Russian expansion. Germany, which was in search of a "lebensraum" suddenly found support in Mackinder's theory and were presented with a scenario for world domination (Weltpolitik).[14]

Mackinder's Heartland roughly represented the territorial core of the Soviet Union. Thus the German invasion of Russia, a move in to the Heartland could be considered as a derivative from Mackinder's theory. His argument for creation of a buffer zone between Germany and Russia was put in to effect during the 1919 Paris Peace Conference. In his initial treatise, Mackinder did not pay any attention to the United States but in 1924 he published his theory of the Atlantic Community in which foreseeing the decline of Britain as the world's leading power, he called for Western Europe and North America to become a single community of nations – a forerunner of the North Atlantic community. The idea, in fact, became a reality after World War II with the formation of the North Atlantic Treaty Organization (NATO). It may be reasonable to state that Mackinder's theories influenced not only Germany but also Cold War geopolitics and the formation of NATO.[15]

Later in a 1943 article titled "The Round World and the Winning of the Peace." Mackinder discarded his famous 1919 dictum that rule of Heartland meant command of World-Island. More important, Mackinder's concept of the map of the world had changed, as he introduced the concept of a world balanced by a multiplicity of regions, each with a distinct natural and human resource base. His original concept of the pivot area of the world had changed from that of an arena of movement (i.e., as a region of mobility for land forces) to one of a "power citadel" based upon people, resources, and interior lines.[16] The three boundaries that reflect Mackinder's changing views of the earth indicate that he was well aware of technological developments, including air power and these are cartographically drawn by Saul Bernard Cohen in his seminal work on Geopolitics (See Figure 3). In fact, post–Cold War American balance-of-power goals are more in consonance with Mackinder's 1943 global view.[17]

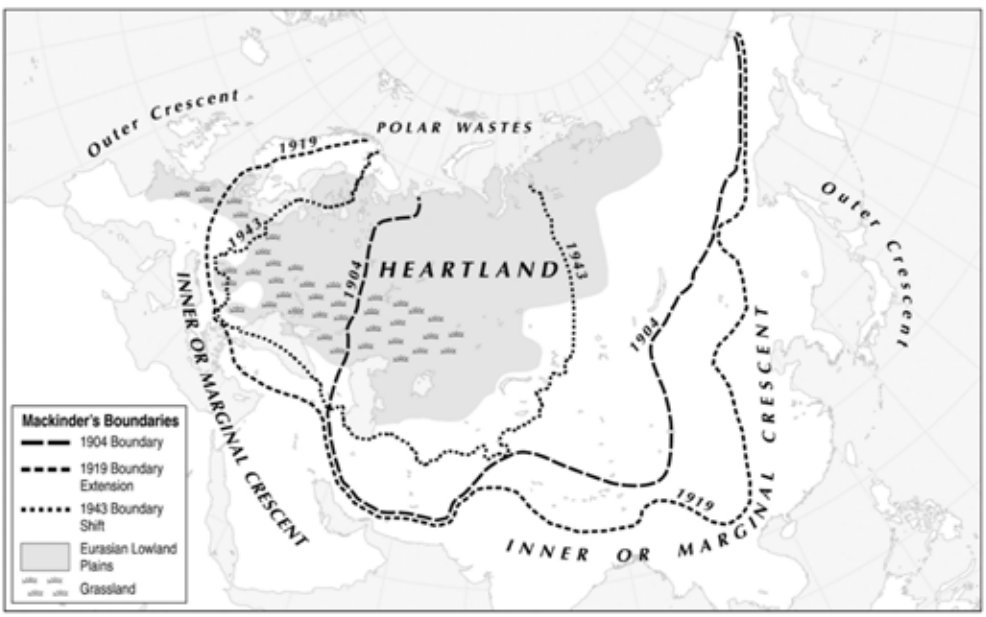


Figure 3. Changing Heartland Boundaries (Source: Saul Bernard Cohen)

Major General Professor Dr. Karl Haushofer was a German Army officer, political geographer and a leading proponent of geopolitics. In an attempt to put Haushofer on the list of German major war criminals, Sidney Alderman US Chief of Council during the Nuremburg Trials had projected Haushofer as Hitler's intellectual godfather and stated on 7 September 1945:

"It was Haushofer, rather than [Rudolf] Hess, who wrote 'Mein Kampf' and who furnished the backbone for the Nazi bible and what we call the common criminal plan. Geopolitics was not merely academic theory. It was a driving, dynamic plan for the conquest of the heartland of Eurasia and for domination of the world by the conquest of that heartland… Really, Hitler was largely only a symbol and a rabble-rousing mouthpiece. The intellectual content of which he was the symbol was the doctrine of Haushofer."[18]

Haushofer's influence on Hitler was the subject of a significant Allied propaganda literature during World War II and it is now generally conceded that his influence on Hitler was wildly exaggerated. It was Rudolf Hess, Haushofer's aide-de-camp during World War I, who first introduced Haushofer to Adolf Hitler in 1922. During the time of Hitler's imprisonment in Landsberg, Haushofer gave him a copy of Ratzel's Political Geography while he was dictating Mein Kampf to Hess.[19] Contrary to popular belief, Haushofer did not contribute a word to Mein Kampf, he declined to review it in his Zeitschrift für Geopolitik.[20] According to Haushofer's own writings, "The book *Mein Kampf,* I saw for the first time when the first edition was already in print. I refused to review this book because it had nothing to do with geopolitics".[21]

Haushofer taught and wrote during the inter-war period, under the influence of Ratzel's organic state theory and regarded Mackinder's "The Geographical Pivot of History" as a geopolitical masterpiece. According to his own writings, "Although not the originator of the technical term "geopolitics", nevertheless, I have rightly been considered as the leading exponent of its manifestation in Germany."[22] Haushofer stated, "Not by accident is the word 'Politik' preceded by that little prefix 'geo'. This

prefix means much and demands much. It relates politics to the soil… Geopolitik demonstrates the dependence of all political developments on the permanent reality of soil." He has further added, "Geopolitik is a child of geography".[23]

Haushofer's theory had three primary elements: First, Lebensraum, which he defined in practical terms as a nation's right and duty to provide necessary space and resources for its people and to obtain Lebensraum, a state was justified to resort to "just wars"; Second, Concept of Autarky (originally developed by Kjellen) referred to economic national self-sufficiency and states' right to maintain it. In other words, a great power is required to produce everything that it needs, keeping the state in economic balance and independent of imports; Third, Pan-regions – Put simply: no nation is a region unto itself; hence the necessity to extend its area (space) to include one, people of similar speech and culture and two, people of related speech and culture. In this, he advocated annexation of the lands of settlements similar and related to German culture.[24] However, Haushofer later stated, "Imperialistic plans of conquest were never favored, neither by me in my writings nor in my lectures. I always regarded dreams of such annexations as dangerous dreams and therefore disapproved them.[25] (For Haushofer's pan-regions see Figure 4).

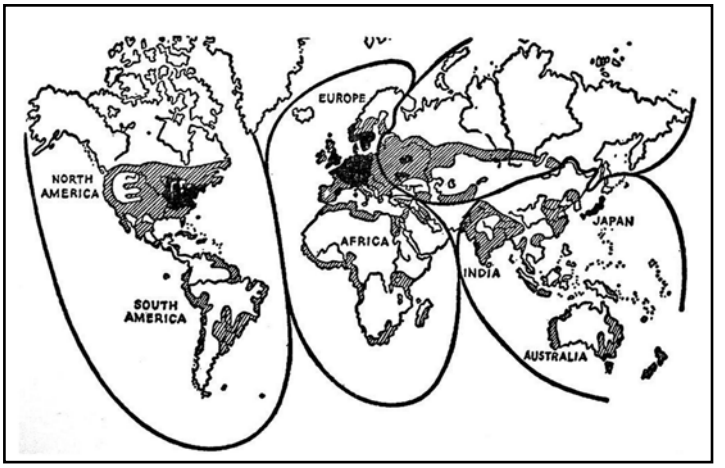


Figure 4: Karl Haushofer's pan-regions (Source: Criekemans, 2007: 270)

Haushofer's peculiar contribution to geopolitics was his concept of fluid and dynamic frontiers or ever changing 'border region'. As opposed to fixed and static borders prevailing in his time, he advocated dynamic borders changing in accordance with the state's search for lebensraum, autarky and pan-regionalism.[26] Mackinder's Heartland became the centerpiece of his theory.[27] The American scholars have tried to project that Haushofer's theories laid the intellectual foundation and legitimacy for Hitler's just war.

The US geographical scholars such as Isaiah Bowman described geopolitics as intellectually fraudulent, ideologically suspect, and tainted by association with Nazism and its associated policies of genocide, racism, spatial expansionism and the domination of place. In 1954, Richard Hartshorne, who had worked in the Office of Strategic Services (the forerunner of the Central Intelligence Agency) during the Second World War and helped to generate geographical intelligence for the US military, declared geopolitics as an intellectual poison. With this level of indictment, perhaps it is not surprising to learn that many geographers in the United States and elsewhere including the Soviet Union were unwilling to enter this intellectual terrain. Within 50 years of its formal inception, geopolitics stood condemned by a cabal of geographers and more importantly by writers contributing to widely read American magazines such as Reader's Digest, Life and Newsweek.[28]

After Germany's defeat, when Haushofer was investigated for alleged war crimes, he and his Jewish wife committed suicide in 1946.[29] His death and subsequent vilification of "geopolitics" as a Nazi enterprise resulted in its virtual disappearance from the academic literature.[30]

American Geopolitics

Geopolitics as a science or concept was simultaneously pursued in the American continent but without referring to the word "geopolitics" as such. ***Admiral Alfred Thayer Mahan*** was the United States' first well-known strategist or geopolitical theorist, who advocated the supremacy of

sea power over land power.[31] Mahan recommended that the acquisition of naval power was the single most important factor in determining a nation's geopolitical power. His work was later to be translated and read with great enthusiasm in Germany and played a part in shaping German geopolitical thinking in the 1920s and 1930s[32] and it influenced the build up of naval forces in the years prior to World War I, especially in Germany. His distinction between land and sea powers continued to influence geopolitical thinkers throughout the Cold War.[33]

Isaiah Bowman, Director of the American Geographical Society, played a significant role in the foundation of Council on Foreign Relations and the publication of its famous journal Foreign Affairs. He published his book "New World: Problems in Political Geography" in 1922, identifying an increasing role for the United States in world politics. Bowman believed that America should play a central role in the development and evolution of the world economy. He was later to be instrumental in providing specialist advice to the Roosevelt administration in the early 1940s, leading to the establishment of the United Nations.[34]

Another influential name is Dutch-born American scholar ***Nicholas John Spykman***, journalist, sociologist, political scientist and geopolitician, who was chief among the diffusers of geopolitics from Europe to America.[35] Spykman in his book 'America's Strategy in World Politics', told Americans that foreign policy is about power, not about ideals, and the struggle for power was the real aim of world politics.[36] He argued that geography was the most important factor in world politics and emphasized that the size and location – both world as well as regional – played a very important role in a state's foreign policy, as they determine the options that a country might select and adopt as a foreign policy path. For Spykman a state cannot escape from its geography however skilled its Foreign Office is, as "geography does not argue, it simply is."[37]

Spykman was acknowledged for his significant observations about geopolitics that included his understanding of the heartland, the rimland, offshore continents, the dynamics of Eurasia, and his efforts

to provide revisions to some of the concepts advanced by Mackinder.[38] Spykman adopted the basic ideas of Mackinder's Heartland theory, but gave it a different interpretation. Spykman advocated that the Heartland was not the key area but the region that Mackinder categorized as 'inner crescent' was supposed to be the most vital geopolitical arena. He called this area the 'Rimland' (See Figure 5). In other words, Spykman contended that the periphery of Eurasia but not its core was more important for acquiring global power.[39]

Figure 5: Nicholas John Spykman's Rimland theory (Source: Polelle, 1999: 118)

He offered his own formula in *'The Geography of Peace'*, a work published posthumously in 1944:

"Who controls the rimland rules Eurasia;
Who rules Eurasia controls the destinies of the world"[40]

According to Spykman, Rimland was economically most valuable, and not the Heartland because the former had the advantage of having access to both the major land and sea transportation routes. In addition, Rimland contained large amounts of natural resources and a high population. Spykman, therefore, advised the United States to maintain a power balance in this region since the Rimland – and not the Heartland – was the key to control the Eurasian continent, and in particular Western Europe and Southeast Asia.[41]

In 1942, when anti-German and anti-Japanese propaganda was at its heights in America and the United States was allied with the Soviets, Spykman publicly expressed his unconventional views about the desirable post-war American diplomacy. He proposed that once Germany and Japan had been defeated, both the nations should be included in an anti-Soviet alliance due to the fact that Moscow would be gaining a too favorable position in Eurasia. He thus anticipated the end of the Soviet-Western alliance and the formation of a Western alliance axed on the North-Atlantic.[42] For this reason Spykman is also often referred as the *"Godfather of Containment"* along with George Kennan.[43] Though, not all of Spykman's predictions turned out to be true.

The word "geopolitics" was rarely ever used during the Cold War until ***Henry Kissinger*** brought it back in to use in the 1970s and thereafter it continued to affect the political practice throughout the later part of the 20th century. Because of Kissinger's popularization of the term, geopolitics spiraled well beyond the so-called geopolitical tradition to become a synonym for the space of global politics.[44]Throughout the Cold War, both super powers developed geopolitical strategic views that guided and legitimized their actions as they began to develop their roles as world powers. Their geopolitical views aimed at commanding the world and took the form of ideologies. In fact Cold War itself was nothing but the display of geopolitical competition on the global scale.

According to ***Zbigniew Brzezinski***, "the contest between the United States and the Soviet Union represented the fulfillment of the

geopoliticians' fondest theories: it pitted the world's leading maritime power, dominant over both the Atlantic and the Pacific Oceans, against the world's leading land power, paramount on the Eurasian heartland… The winner would truly dominate the globe. There was no one else to stand in the way, once victory was finally grasped."[45]

In the end, the USSR collapsed, making the United States the victor and the sole super power, without winning any battle.

A study of the historical trend reveals that Geopolitics becomes predominant during times of war, crisis or any upheaval. For example, at the end of Cold War during the dissolution of the Soviet Union, the study of geopolitics reemerged after nearly half a century of neglect. New scholars or academics propounded new geopolitical theories to go along with the new sole super power and the emerging world order. The demise of the Soviet Union as an ideological order altered the basis on which Cold War ideological geopolitics was being conducted.

Samuel Huntington, famous author of "The Clash of Civilizations?" advocated that the politics of the new era would take place along civilizational fault lines. He hypothesized that the fundamental source of conflict in the new world would not be primarily ideological or primarily economic but the great divisions among mankind and the dominating source of conflict would be cultural. The fault lines between civilizations would be the battle lines of the future.[46]

Another reputed American political scientist ***Francis Fukuyama,*** who became famous for his book "The End of History and the Last Man", asserted that we had been witnessing not just the end of the Cold War but the end of history. According to Fukuyama, "the twentieth century that began full of self-confidence in the ultimate triumph of Western liberal democracy seems at its close to be returning full circle to where it started: not to an "end of ideology" or a convergence between capitalism and socialism, as earlier predicted, but to an unabashed victory of economic and political liberalism".[47] What he considered as the end of history was

the end point of mankind's ideological evolution and the universalization of Western liberal democracy as the final form of human government.[48]

Definition of Geopolitics

Geopolitics has been defined by various geographers or geopolitical scientists at different times. ***Karl Haushofer*** (1869-1946), the father of German geopolitik, defined Geopolitics as "the new national science of the state,… a doctrine on the spatial determinism of all political processes, based on the broad foundations of geography, especially of political geography."[49]

In the famous journal, "Zeitschrift für Geopolitik", which Haushofer started to publish with like-minded geographers, viz., Erich Obst (1886-1981), Otto Maull (1877-1957) and Hermann Lautensach (1886-1971), the following definition was expounded in a joint essay published in 1928:

1. Geopolitics is the science of conditioning of political processes by the physical territory (or earth) on which they take place.

2. It is based on the broad foundations of geography, especially political geography as the theory of states as living political organisms occupying particular territories, and their structure.

3. The essence of regions as comprehended from the geographical point of view provides the framework for geopolitics with in which the course of political processes must proceed if they are to succeed in the long term. Though political leaders will occasionally reach beyond this frame, the earth dependency will always eventually exert its determining influence.

4. With this sense in mind, geopolitics aims to provide tools for political action and act as a guidepost in political life.[50]

A simplified definition of Geopolitics derived by ***Saul Bernard Cohen***, American political geographer, famous as a leading scholar of post-World War II geopolitics, in his 2003 book is:

"Geopolitics is the analysis of the interaction between, on the one hand, geographical settings and perspectives, and, on the other hand, political processes. (...) Both geographical settings and political processes are dynamic, and each influences and is influenced by the other. Geopolitics addresses the consequences of this interaction."[51]

Colin Flint, who has carried out an elaborate study of the concept of Geopolitics, highlighted that power has always had a central role in the definition. According to him:

"Geopolitics as the struggle over the control of spaces and places, focuses upon power or the ability to achieve particular goals in the face of opposition or alternatives. In nineteenth and early twentieth century geopolitical practices, power was seen simply as the relative power of countries in foreign affairs… In the late twentieth century, (...) definitions of power were dominated by a focus on a country's ability to wage war with other countries."[52]

According to Encyclopedia Britannica, "Geopolitics is the analysis of the geographical influences on power relationships in international relations."[53]

Cambridge dictionary defines Geopolitics as "the study of the way a country's size, position, etc., influence its power and its relationships with other countries."[54]

Components of Geopolitics

Geopolitics revolves around the control of place or position to establish power of a nation in the international arena. The influence of a place cannot be determined only by its size, location and people occupying it but it consists of multiple dimensions, which can be called as components of geopolitics:

- Economy that is required for providing food, clothing and shelter to people as basic needs and subsequently to meet their higher needs to become a prosperous society;
- Politics for providing organization to govern and rule the nation;
- Military for defending the sovereignty and territorial integrity of the nation and waging war if required to attain the political objectives;
- Technology to manage, maintain and sustain the economy and military both; and finally
- Culture, which covers everything from community to social bonding and creativity.[55]

These geopolitical components are shaped by three aspects: First, there are constraints of place; Second, there is the degree to which the various systems interact to create power in all its dimensions; Third and finally, there are surrounding community / nations, their power, their fear and desires.

These taken together create imperatives and constraints. Imperatives are the activities that must be done for a nation / community to survive and prosper. Constraints are the things that cannot be done. Each nation struggles to align its imperatives with the constraints to the extent reality allows them to do. Evaluating a nation in terms of imperatives and constraints enables one to compare the relative power of nations.[56] This power is always asymmetric. Some nations have greater economic power, others greater military power and so on. For example in 1985, the Soviet Union's GDP was only $741.9 billion compared to Japan's $1,220 billion. But while Japan was an economic giant, it was militarily weak. The impoverished Soviet Union, on the other hand, had a military machine on par with the United States'.[57]

Geopolitics to Geo-economics

While geopolitics was in the ascendant in the Nineteenth and Twentieth centuries, states were able to achieve competitive advantage over one another largely through their initiatives based on military power or ultimately through waging war. At the turn of the 21st Century, nation states came to realize that war is no longer a profitable option. In fact, as the Cold War was ending, emphasis began to shift from military to economic power.

In 1990, Edward N. Luttwak first coined the term “geo-economics” in his seminal article, “From Geopolitics to Geo-Economics: Logic of Conflict, Grammar of Commerce” to describe how in the post-Cold War period, the main arena for rivalry between states would be economic rather than military. Luttwak observed, “Everyone, it appears, now agrees that the methods of commerce are displacing military methods – with disposable capital in lieu of fire power, civilian innovation in lieu of military-technical advancement, and market penetration in lieu of garrisons and bases.” He further predicted more or less complete transformation of state action guided by the emergence of “Geo-economics”, which he defined as “This neologism is the best term I can think of to describe the admixture of the logic of conflict with the methods of commerce – or, as Clausewitz would have written, the logic of war in the grammar of commerce.”[58]

Three years later, Samuel Huntington also emphasized the importance of economic activity in inter-state relations, in a more forthright manner. He wrote, “Economic activity… is, indeed, probably the most important source of power, and in a world in which military conflict between major states is unlikely, economic power will be increasingly important in determining the primacy or subordination of states.”[59] Interestingly, Luttwak had also further elaborated on his ideas in a book published three years later in 1993.[60]

In fact, the emphasis on economic power considerably increased after China's rise. Having created enormous wealth in a short span of three decades, China is regarded as the "leading practitioner of geo-economics" and a "maestro" at playing the economic game.[61] With the option of challenging American military might in a comprehensive manner or in a large-scale war by China being considered as remote or even irrational,[62] China is exploiting economic means to the hilt for pursuing its geopolitical objectives. Contrary to the Western countries where economic power is held by the private sector, which is unlikely to respond to national geopolitical objectives, both China and Russia have adopted a very refined form of capitalism referred to as the 'State capitalism' or 'Authoritarian capitalism' by economists. In this hybrid economic structure, large segments of economy are controlled by the state but these operate side-by-side with a largely market-oriented private sector. China exercises control through national oil and gas corporations, state-owned enterprises (SOEs), state-controlled banks and sovereign wealth funds (SWFs). To name a few, China has banks like the Industrial and Commercial Bank of China and the Agricultural Bank of China, and of energy and heavy industry firms like Sinopec, Sinochem and the China Railway Construction Corporation, which were seen as harbingers of modernization. The Russian co-equivalents are energy giants like Gazprom and Rosneft promising to bring commercial value to Russia.[63] Added to this is the increasing interdependence of national economies through globalization, which created varying degrees of dependency and vulnerability. According to Professor Joseph S. Nye, "Manipulating the asymmetries of interdependence is an important dimension of economic power."[64] China has been using finance, investment and trade to build alliances and gain influence in countries across Africa, Asia and Latin America.[65]All these factors, joined together have enabled China to employ economic means of power as a first-choice option.

Launched in the autumn of 2013, President Xi Jinping's flagship One Belt, One Road (OBOR) is China's grand geo-economic initiative through which it has planned to invest hundreds of billions of dollars to

create a network of roads, railways, ports, power plants, pipelines, LNG terminals, industrial zones and logistics centers along the proposed corridors, which it hopes will collectively harness the potential of commerce in a Sino-centric economic order. 64 countries are located along the identified land and sea routes. Beside strengthening economic links with these countries through increased trade, investment and financial flows, and curb the slow down of its economy by expanding exports to under-exploited markets, Beijing wants to enhance its geopolitical influence with the broader aim to 'rejuvenate' the Chinese nation and reclaim China's historical pre-eminence in Asia.[66]

Other nations are also placing increased emphasis on economic means in power politics. For example, Brazil and South Africa have been using state-owned banks and state-owned enterprises to create asymmetric relations with neighboring countries in order to maintain (sub) continental spheres of influence. Oil-rich states, especially Qatar and Saudi Arabia, employ 'cheque book diplomacy' to wield influence in regional affairs.[67]

In geo-economics, the objective of a state is strategic or 'geopolitical': widening and deepening the sphere of political influence through economic means and making others do as per its own desire. According to the proponents of geo-economics, power and security are not simply linked to the physical control of territory but also to commanding and manipulating the economic ties that bind states together. In today's interdependent world, geo-economics can be employed in two forms: positive form (the proverbial "carrot"), which relates to commercial activity and mutual economic interest; and negative form (the "stick"), which involves explicit and implicit threats of cut-offs, price increases and so on.[68]

Russia is tied to Europe with its gas and oil infrastructure as well as other economic links. Russia has often used its energy resources as energy geo-economics to drive political wedges at the European Union level and with in the member states, and furthering its aspirations of

a great power status. For instance, subsequent to the Ukraine crisis, in September 2015, Russia's Gazprom announced the Nord Stream II project with a consortium of five European firms: Germany's Uniper and BASF's Wintershall Unit, Anglo-Dutch firm Shell, Austria's OMV and France's Engie.[69] The original project, named Nord Stream (I), comprising of two natural gas pipelines (starting from Vyborg in Russia and terminating at Greifswald in Germany) was completed in August 2012, with a total annual capacity of 55 billion cubic meters of gas. Russia's move appeared to bypass traditional transit countries viz., Ukraine, Slovakia, Czech Republic, Belarus and Poland. The overall annual capacity will be doubled to 110 billion cubic meters.[70] Despite warnings from the United States, Ukraine, Poland and Lithuania and the European Union Commission over Europe's energy security, the "raw" laying of the pipeline from Vyborg in Russia up to its landfall site at Germany's Baltic Sea Coast would be finished by the middle of 2019.[71] In order to fill both Nord Stream I and II after 2019, the existing pipelines through Ukraine and Poland would be subjected to much less use. Nord Stream II being mostly underwater pipelines will be extremely expensive costing around € 10 billion. Commercially, it is more profitable to use existing gas infrastructure, which was already under utilized, operating at only 50 percent of its capacity, rather than build new under water gas pipelines. But it offers two fold advantages to Russia: Firstly, Russia would increase its influence over Ukraine by depriving it of revenue to the tune of $ 2.2 billion per year and erode its key position against Moscow as a transit state between Russia and the EU markets. This would also leave Ukraine exposed to price increases and cut-offs, as Gazprom could switch off supplies to Ukraine with out affecting its EU clients; Secondly, Russia can re-establish its influence in Germany, potentially weakening Berlin's solidarity with in the EU ranks. This would be achieved by increasing the market share in Germany and providing Germany the key transit country status to European markets. Thus Nord Stream II is employed by Russia as a 'geo-economic wedge' combining both the 'carrot' (for Germany) and 'stick' (against Ukraine) forms to

create divergent pressure on EU members, thereby weakening the unity of the EU and at the same time punish Ukraine.[72]

China has also been increasingly relying on economic coercion to pressurize its neighbors. For example, in response to the prospective deployment of the United States' Terminal High Altitude Area Defense (THAAD) Missile System in South Korea, China had reportedly deployed economic retaliatory measures against its neighbor, such as: capping the number of its tourists into South Korea, restricting the import of South Korean cosmetics, barring a number of South Korean entertainers from performing in China, and rejecting the plan of South Korean airlines to operate chartered flights to China.[73]Another notable example is Chinese restrictions on export of rare earth minerals to Japan in 2010, following the arrest of a Chinese ship captain after he rammed a Japanese Coast Guard vessel in East China Sea.[74] Though the studies suggested later that any decline in rare earth exports to Japan in the latter half of 2010 was more likely the result of China's earlier decision to cut world-wide rare earth exports and was not related to this incident.[75] However, the articles appearing in media did create panic amongst the businesses and officials in Japan.

Philippines is a classic example where Chinese leaders have applied economic levers for geo-political purposes very successfully. Under the rule of Benigno Aquino III, the Philippines government had initiated an international arbitration case against China's South China Sea claims and conduct. In response, the Chinese government discouraged trade and investment with the Philippines.[76] For example, Philippines economy being heavily dependent upon steady Chinese demands for its agricultural products, China had refused to allow 150 containers of Cavendish bananas to enter its market on flimsy grounds. China also slapped a travel advisory on the country to keep away its tourists.[77] In spite of these hurdles; the Philippines not only managed to maintain steady growth of its economy but also did not withdraw the case. In July 2016, the International Tribunal at Hague ruled in favor of the Philippines, dismissing China's historic claim over the South China

Sea. However, the Philippines new President Rodrigo Duterte during his visit to Beijing in October 2016 played down the International Court's ruling, lavishly praised his host and agreed to bilateral talks on the South China Sea's dispute, which Beijing had been urging for years. Moreover during his visit to China, he denounced his country's long-standing partnership with the United States, both military as well as economic. Obviously, the Chinese economic inducements were very high for him to deny - $ 13.5 billion worth of deals, with Beijing commitment of over $ 9 billion in low interest loans.[78]

India's 'Act East' Policy under Prime Minister Narendra Modi is also a decidedly geo-economic initiative – extending new credit lines to Nepal and Mauritius, speeding up rail-links with Nepal and Bangladesh and so on.[79]

If we consider Luttwak's usage of the term geo-economics as the start point, has geo-economics really replaced the geopolitics? Having studied the application of geo-economics or the economic statecraft in the aforesaid examples, it emerges that the geo-economics is only a component of national power used by the states to achieve their geopolitical ends. There is no widely shared definition of geo-economics.[80] To avoid the confusion between geo-economics and geopolitics, there is a need to arrive at a focused definition of geo-economics. Robert Blackwill and Jennifer M. Harris, the two distinguished scholars in their book, "War by Other Means: Geo-economics and Statecraft" have defined geo-economics as:

"The use of economic instruments to promote and defend national interests and to produce beneficial geopolitical results; and the effects of the other nation's economic actions on a country's geopolitical goals."[81]

It emerges very clearly that economic instruments are the means to achieve geopolitical ends. It may be apt to quote Daniel Bell that "economics is the continuation of war by other means".[82]

Contrary to the expectations of Edward Luttwak and thereafter Samuel Huntington, geo-economics has not entirely replaced military means to achieve the geopolitical objectives. Economic and military instruments of power continue to coexist and are being used by the states depending on what they consider adequate to achieve their strategic objectives. In fact, both economic and military powers are interlinked and are complementary with the ultimate aim of achieving the geopolitical objective. For example, during the Obama administration, the United State's geo-economics was focused on Trans-Pacific Partnership and the Transatlantic Trade and Investment Partnership but at the same time, it shifted its own military focus towards the Asia-Pacific region, supported its European partners militarily against Russia and built military partnerships with regional countries and major European powers in the Middle East.[83]

Ultimately, as the ancient Indian strategist Kautilya wrote in 'Arthashastra', "from the strength of the treasury the army is born". Thus in the modern context, robust economy of the state achieved by high growth rate and improved governance, is required to create comprehensive national power that encompasses everything from building technology and military capability to infrastructure and even welfare of its population.[84]

Technology as the Key to Economic and Military Powers

To understand the primacy of technology in geopolitics and give it the due credit, one has to dig deep in to the history starting from the period of industrial revolution. The industrial revolution had influenced not only the economy of the states and living conditions of people but also the nature of warfare. Till now history has seen three industrial revolutions.

In all of these revolutions, technology has played a key role both in their genesis as well as outcome: It is the convergence of new technologies with new energy systems or resources, which gave rise to any industrial revolution;[85] and the impact of industrial revolution has

resulted in an increase of economic power as also an enhanced military power or even in revolution of warfare techniques.

The First Industrial Revolution took place from 1760 to 1840. Britain was the birthplace of first industrial revolution. It had great deposits of coal and iron ore and being the world's leading colonial power, its colonies could serve as a source for raw materials, as well as a market place for manufactured goods. Earlier the manufacturing was done using hand tools or simple machines. Industrialization not only brought in powered machines but also steam engine and locomotives leading to an improved system of transportation and communication. The industrial revolution brought about a greater volume and variety of factory-produced goods, leading to higher standard of living for many people, particularly the middle and upper classes. However, life for the poor and working classes continued to be grim, with wages for those working in the factories being low and working conditions pathetic. Interestingly, the British enacted legislation to prohibit the export of their technology and skilled workers but they could not succeed. Industrialization spread from Britain to other Western countries viz., Belgium, France, Germany and the United States. By the mid-19th Century, industrialization was well ensconced throughout the West Europe and America. By early 20th Century, the United States became the world's leading industrial nation.[86]

The Second Industrial Revolution, also known as Technological Revolution, started from somewhere around 1870 and continued well up to mid-Twentieth Century. During this period electric power led to mass production. The telephone and later radio and television became the communication medium to manage a more complex and dispersed oil, auto and suburban era and mass consumer culture.[87]

The Third Industrial Revolution, often called the Digital Revolution commenced in the last decades of the Twentieth Century and produced semiconductors, computers, Internet technology and renewable energies. Merger of Internet technology and renewable energies created a new infrastructure for the Third Industrial Revolution.[88]

Impact of Industrial Revolutions on Warfare

New advances in industry, science and technology during the Industrial Revolution not only enhanced the combat potential of the military forces but military logistics also got a tremendous boost because of the development of new means of transportation and communications. During the period of industrial revolution, many new discoveries took place, which were put to use by the military. The new discoveries led to the creation of new philosophy of warfare and the technologies became the foundation of military thought.

The influence of industrial revolution or technology on warfare can be distinctly studied in three phases:

American Civil War (1861-1865) is considered as the first truly modern war, which encompassed all aspects of modern technology developed in the private sector. The first ever use of rail and waterways and armored ships was made over large areas of military operations. The railways made armies mobile to a degree that was previously unimaginable. The importance of a solid industrialized infrastructure supporting the war front was established for the first time. European leaders learned from the civil war the proper employment of mass armies, railroads, telegraphs, armored ships and artillery.[89]

The pace of technological innovation got accelerated in the last part of the Nineteenth Century, with wireless telegraphy coming at the end of the century. With the tank and airplane having been invented in the beginning of Twentieth Century, science and technology became intertwined with future warfare. The First World War demonstrated that Industrial Revolution provided the nations a war-fighting machine of the magnitude previously unknown. Machine guns, powerful and more accurate artillery weapons had led to a predominantly defensive warfare. The great railway network in thickly populated industrial areas, built with an eye to strategy as well as to commerce, had enabled to rush huge armies to the front with in a few hours of general mobilization. Artillery

barrages were the order of the day. Poison gas and chlorine gas were used on the battlefield. Armored cars or tanks existed before the war began but their employment got restricted due to necessity of staying on hard roads. The material cost of the war and number of killed and permanently disabled during World War I were staggering.[90]

Technology continued to improve the weapons of war, particularly the aircraft and the tank. The most important of the new scientific inventions of World War II were radar, the proximity fuze, electronic fire control equipment, anti-submarine warfare weapons, rockets and the ultimate weapon of mass destruction – the Atom Bomb. These new developments brought in new concepts of warfare, which significantly affected the outcome of World War II.

It is clearly evident from the past history that technology is the fulcrum around which economic and military powers revolve. Technology is the means through which states have achieved their geopolitical objectives or in other words established their dominance in international power relations, while economic or military powers are only outward manifestations of technology.

Civil application of technology brings economic prosperity to the countries which own it but those which are deprived of the same, fall down in the ladder of development and may even reach to a stage of economic misery. If there is a smooth transfer of economic resources or means of development from rich to poor states, then the whole world can prosper. Technology being always of dual use, the rich countries in order to safeguard their economy and also the population invest heavily in the military applications of technology to strengthen their military power. On the other hand, poor countries also tend to acquire technology both civil and military through various means. This results in a conflict, which may end up in war.

The economic development progresses much faster resulting in to rapid economic growth because the products are consumed or used

by the whole population. This results in to comparatively long periods of peace and social stability. However, war is of comparatively shorter duration because it is conducted by a small proportion of the population i.e., the armed forces but consequences are faced by the whole nation because of the destruction and damage caused. For example, American Civil War was the largest and most destructive conflict in the Western world between the end of the Napoleonic Wars in 1815 and the onset of World War I in 1914[91] and it lasted for only four years (1861 to 1865). Similarly, World War I duration was of four years (28 July 1914 to 11 November 1918) and World War II lasted for six years (1939 – 1945). Though gunpowder had been around for several centuries but it is the mass production and new means of communication created by the Industrial Revolution, which had brought tremendous changes in warfare and it is evolving continuously because of advancement in technology.

Irrespective of the introduction of term 'geo-economics', economic power has never been able to replace military power or vice versa. Both have their own significance in achieving the geopolitical objectives of a nation. Rather it is the technology, which is increasingly gaining importance amongst the nations vying for a dominant role in the international arena.

With the Fourth Industrial Revolution having commenced, the technology is no longer bounded by physical or geographical domains of a nation. Hence its significance in world power politics needs to be recognized.

Fourth Industrial Revolution

Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum is credited with coining the term Fourth Industrial Revolution for having written a book by the same name in January 2017. Previous industrial revolutions liberated humankind from animal power, made mass production possible and brought digital capabilities

to billions of people. Schwab has brought out very convincingly that the Fourth Industrial Revolution is fundamentally different and is characterized by a range of new technologies that are fusing the physical, digital and biological worlds.[92] It is marked by emerging technological breakthroughs in a number of fields as diverse as artificial intelligence, the internet of things, robotics, quantum computing, 3 D printing, nanotechnology, biotechnology, Machine learning, Block Chain and autonomous vehicles[93] – and especially the synergies among them are profusely reshaping all forms of human endeavor. This revolution is peculiar due to: the exponential speed at which it is progressing; unprecedented dimensions of its effects, and the ways it is disrupting and transforming the industries, nations and even human society.[94] The disruptive technologies likely to be evolved during Fourth Industrial Revolution will shape the global power relations in an unprecedented manner.

The history of warfare and international security is the history of technological innovation, and today is no exception. The Fourth Industrial Revolution will profoundly influence the nature of conflict. Modern conflicts involving states are becoming increasingly “hybrid” in nature, combining traditional battlefield techniques with elements previously associated with non-state actors. The distinction between war and peace, combatant and noncombatant, and even violence and nonviolence is becoming uncomfortably blurred. As this process takes place and new technologies such as autonomous or biological weapons become easier to use, individuals and small groups will increasingly join states in being capable of causing mass harm. Thus, the advances in technology will decide the level of violence based on new modes of protection or greater precision in targeting.[95]

A nation needs not to go through the hierarchical phases of development because of the technological breakthroughs. The President of the World Economic Forum (WEF), Borge Brende, firmly believes that Fourth Industrial Revolution can help India leapfrog traditional phases of development and accelerate its transition to a developed nation. Brende

wrote a blog post on Prime Minister Narendra Modi's website (10 April 2018), stating that "The impact of technological revolution on economies and society is not preordained and can be shaped by policies at the local, national and global levels". He further said, "India is well positioned to enhance its global leadership in a post Fourth Industrial Revolution era".[96]

China's Quest for Technological Supremacy

China, till now, has been successfully adopting and producing technologies developed elsewhere. Its export success story has been built on its participation in global supply chains, taking advantage of its world-class infrastructure and relatively cheap and skilled labor force. China should have gradually developed indigenous products and enhanced its level of technology. China did not succeed in this and is located down below in the global value chain. China's largest PC manufacturer, Legend (renamed as Lenovo) took over IBM in 1998 but it has merely played the role of a "mover" (*banyungong*) for foreign technology.[97] With a view to pursue quick profits, almost all the Chinese enterprises had been keen to import foreign technology as the way to upgrade production technology, while in such purchases equipment dominated over software such as patents, know-how, blue-prints etc. Once the equipment was imported, almost no financial resources were given to absorption, assimilation and innovation. As a consequence, few Chinese enterprises owned independent intellectual property rights in core technologies, as it is apparent from the data available on patents. Because of their interest in utility model and design patents, Chinese firms lag far behind their foreign counterparts in invention patents. Thus China has developed rapidly but it was processing- and assembly focused, low-end product-oriented and foreign-invested enterprise-led. China has been exporting "assembled high-tech" products in a large quantity but does not enjoy higher added value of the product because a larger share of its companies' profits go to owners of core high technologies. To become a high-tech power, China has to move beyond the advantage

that it offers in terms of low-skill labor and gain a competitive edge in a "cluster" of technologies.[98]

With a view to comprehensively upgrade its industry, China has launched its initiative "Made in China 2025" in 2015. The initiative drew direct inspiration from Germany's "Industry 4.0" plan. The focus of the "Industry 4.0" idea is intelligent manufacturing i.e., applying the tools of information technology to production.[99] The goal of China's initiative is to comprehensively upgrade Chinese industry so that it can occupy the highest position in global production chains. The plan is to raise domestic content of core components and materials to 40 percent by 2020 and 70 percent by 2025. Ten key industrial sectors have been identified under this plan.[100]

What is most alarming about China's quest for upgrading its technology is the theft of intellectual property through cyber-espionage, lack of enforcement of intellectual property rights (IPR) and heavy-handed or forced technology transfer (FTT) policies. China reportedly causes approximately $ 600 billion a year intellectual property thefts costs to America.[101]

In the name of protecting software and data, China has devised a cyber security law which forces companies operating in China to disclose critical intellectual property to the government and forces them to store data locally.[102] In 2017, the U.S. President Donald Trump had announced a "zero-tolerance policy on intellectual-property theft and forced technology transfer" and formally instructed Robert Lighthizer, the US Trade Representative, to consider launching an investigation in to China's alleged crimes.[103]

The U.S.- China Trade war, which was started by President Trump to reduce the massive trade deficit with China, has shifted its focus towards more technological matters. Washington has not only demanded Beijing to end its practice of forcing foreign joint venture partners to transfer technologies to their Chinese collaborators, but is also scrutinizing the works of Chinese researchers based in the US.[104]

Chinese companies have reportedly stolen trade secrets from virtually every sector of the American economy: automobiles, aviation, chemicals, consumer electronics, industrial software, biotechnology and pharmaceuticals. Perhaps most damaging to the United States, China has targeted the American defense industrial base. Chinese spies are alleged to have penetrated in to private defense contractors' and sub contractors' domain, national laboratories, universities handling defense research projects, American government and its think tanks. They have reportedly stolen secrets from the United States' state-of-the-art weapon systems such as the F-35 Lightning, the Aegis Combat System and the Patriot Missile System, B-52 Bomber, the Delta IV rocket, the F-15 fighter and even the Space Shuttle.[105]

Bill Reinsch of the Stimson Centre, a think-tank, says the problem American businesses face in China is that its "policy is to let foreigners in, extract their technology, then force them out".[106] In some industries, American companies can enter the Chinese market only in joint ventures with Chinese firms. According to Robert Lighthizer, "As the Chinese government tries to make China a world leader in technology-intensive industries like semiconductors, driverless cars, and biotechnology, the fear is that it will plunder its foreign partners' intellectual jewels, and then get rid of them".[107]

China has become the number one manufacturing and trading nation, and its gross domestic product is the second largest in the world, the largest if measured by purchasing power parity. The economic shift in power became ominous for the United States in light of the great financial crisis of 2008.[108] Further in the Indo-Pacific region, almost every Asian country now has China rather than the United States as its largest trading partner by a significant margin and China's share is continuing to grow.[109] China has contrived a very shrewd and meticulous plan to achieve its geopolitical objective of replacing the United States as the sole super power: first, having opened up its economy in 1978, it acquired Western technology and making use of its cheap labor force it became an export power house, achieving a double digit growth rate

for almost three decades; second, Like all other developed economies, when China's economy started slowing down it is seeking advanced technologies through any means to comprehensively upgrade its industry and occupy the highest position of global production chain; third, launched its massive Belt and Road Initiative through which it can utilize its technological expertise in building infrastructure and find a market for its export-oriented economy with developing countries; and fourth, developing disruptive technologies and venturing into nascent fields like cyber, space, artificial intelligence and robotics, where it will have "first mover" advantage over the United States and there are greater chances to develop inexpensive capabilities.

New Era of GEO-technology

The concept of geopolitics can be traced back to Aristotle and Chanakya. However, modern geopolitics emerged in late Nineteenth century and despite all the differences, both German and American geopolitics had quite similar goals. Starting with Friedrich Ratzel in Germany, Sir Halford Mackinder in Britain and Admiral Alfred T. Mahan in the United States, all had provided a scientific orientation to the geopolitical concept.

Geopolitics or in other words the international power politics hinges on two key aspects: Space and Power. Space, which was initially referred to in terms of geographical location and size (i.e., territory) was later expanded in scope to include the resources embedded in it and the technology to make use of these. In fact, with the advent of Industrial revolution, technology has been playing a decisive role in building up the economic and military power of a state, with a view to achieve its geopolitical ends or 'power'. As the technology advanced, it became a decisive factor in the shift of power equation amongst nations.

With the advent of railways, and considering the superiority of rail over ships in terms of time and reach, Mackinder predicted the decline of Britain being a sea power and consequent rise of Eurasian continental states as this technological development made it possible to

exploit the rich resources of world's largest landmasses. Based on this, he developed his famous Heartland theory, dividing the whole world or globe in to three: the Central Pivot Area, which he later called Heartland, Inner Crescent and Outer Crescent. Later, with in his own lifetime, after witnessing the further technological developments including air power, Mackinder had redrawn the boundaries of earth. Nicholas Spykman, the American scholar and geopolitician identified Mackinder's 'inner crescent' as the vital geopolitical arena and called it the 'Rimland'. With the disintegration of Soviet Union, the Cold War came to an end and there was a sudden realization that war was not a viable option to attain geopolitical ends. "Geo-economics" emerged as a new term in 1990s with Edward Luttwak, followed by Samuel Huntington and Joseph S. Nye, considering that military conflicts were unlikely to occur, advocated the importance of economic power. However, in the coming decades, economic power has not been able to replace the military power. Rather, technology has become so omnipresent that it provides oxygen to both economy and military, for their growth as well as survival, yet it has not been given the credit for attaining the geopolitical objectives of a state. With the arrival of Fourth Industrial Revolution, technology is destined to play a much greater role in all fields, controlling all aspects of human life and the world needs to take note of this new era, where technology will be the primary means to achieve the geopolitical ends of a state. The ongoing tussle between the United States and China is a classic example.

It has emerged very clearly that it is the technology, which will guide the destiny of nations in the international power relations. It will not only control the levers of economic and military powers but govern the lives of people as well. Open confrontation between the nations may be a thing of the past. In fact, the emerging technologies will transform the complete character of the war. New domains, which have been added to the traditional land, sea and air are Space and Cyber. These domains have emerged recently and there are no past precedents to indicate how warfare in these domains will play out and

there is no way to know what kind of destruction or crippling blow it will deliver to the modern society. Vital communications and other support systems today depend entirely on space satellites and networks being operated in Electromagnetic spectrum or cyber domain. Though the Principal International Treaty on Space, the 1967 Outer Space Treaty prohibits weapons of mass destruction in outer space but there is no such restriction on other weapons.[110] With the United States, Russia and China already possessing the anti-satellite missile capability, India has become the fourth member to join this exclusive club of nations.[111] By destroying an adversary's satellites combined with exploiting its cyber domain, that country's economy can be affected by impairing its banking and stock market, its social stability can be affected by destroying its TV / radio broadcast system, power transmission grid, railway control, communications and signaling network, air traffic control system and airline reservation system. A country's military's Command, Control, Communication, Computers, Combat Systems, Intelligence, Surveillance and Reconnaissance (C5ISR) capability can be neutralized by destroying its reconnaissance satellites and hacking its communication capabilities.

Employment of Artificial intelligence, big data analytics, machine learning, autonomous systems and robotics in military operations will complicate the battlefield environment by reducing or even eliminating the role of humans in the decision cycle. Emerging technologies of the Fourth Industrial Revolution will equip a wide range of actors, both state and non-state, with inexpensive capabilities, especially through advances in additive manufacturing (commonly known as 3 D printing).[112] Smaller, smarter and cheaper weapons like autonomous drone swarms with tremendous destructive power will be more cost-effective and provide a paradigm shift in the defensive and offensive aspects of warfare. China is investing heavily in new emerging technologies like electromagnetic rail guns, directed energy weapons, hypersonic missiles and hyper-velocity projectiles, where it is likely to have "first mover" advantage as the U.S. defense budget remains divided in to the heavily over-invested legacy systems built earlier and these newest technologies.[113] China can

afford to invest in to very newest technologies particularly when it does not want to match its military with that of the United States' weapon by weapon but is developing asymmetric capabilities to seek and hit at the United States' vulnerabilities or weaknesses.

With the newest and emerging disruptive technologies, the relevance of geographical boundaries between the nations has diminished. If the kinetic damage or direct human casualties caused by the act of an adversary are the sole criteria for declaring a state of war, then that attribution may never be established and yet there would be colossal damage and chaos. Without crossing the physical boundary, a nation can cause massive damage to its adversary's economic and military structure or even social fabric through the medium of space and cyber. Nations will achieve their geopolitical objectives not based on the size, geographic location, its population, resources, and economic or military power but on the basis of its technological prowess extending in to cyber and space domain.

While studying the genesis of geopolitics it clearly emerged that it was Political geography that got transformed in to Geopolitics. "Geo" in Geopolitics referred to the geography of the earth and the states were biological and geographical organisms, which would expand their domain or control more territory based on their aspirations or in other words to attain their political ends. Initially, military power or war became the primary instrument for achieving the political ends. But having realized the futility of war, with tremendous loss of human lives and infrastructure during two world wars as also the horrifying effects of atom bombs dropped over Japan, the period of peace, which followed was utilized by the nations for economic development. One of the major causes of Soviet Union's dissolution was economic factor beside cultural and social divide. Subsequent to the end of Cold War, concept of geo-economics was introduced. Geo-economics could never replace the role of military power. Further, most scholars seldom explained what the 'geo' in geo-economics meant and what made geo-economics different from International Political Economy.[114] In any case, technology formed

the basic fabric of both economic and military powers and technology has now transcended from Earth to Electromagnetic Spectrum to Space orbits. Technology in the realm of geopolitics deserves to be exalted as Global, Electromagnetic Spectrum and Orbital technology or GEO-technology.

"GEO-technology can be defined as the employment of geo-technological instruments to promote and defend national interests and enable a nation to achieve its geopolitical ends. Further, it should reduce or neutralize the effects of adversary nations' geo-technological actions on a country's geopolitical objectives."

In future, nations will become weaker or stronger depending upon the way they manage their geo-technological resources. Demonstration of geo-technology in its different spheres will establish a country's dominance over others in international power politics and will add to the deterrent potential of a nation. Further, in the Nineteenth century, it was the likely use of earth's rich resources, which guided the power equation of nations. Similarly, in the coming future, nations are competing for the acquisition of rich resources present not only in the untapped regions of earth and the oceans but are racing to the far away planets like Sun, Moon, Mars, Jupiter and so on, to tap their resources and hidden potential. Technological advancement has allowed them to dominate even the invisible spectrum.

It has become obvious that whichever nation will be able to use or exploit greater resources or bigger share of three domains, will rule the world. Hence it can be said:

> ***"Whoever controls the GEO-technology, rules the three domains,***
> ***Whoever controls the three domains, commands the destiny of the World."***

Ultimately, it will be the GEO-technology, which will make the final difference between the winner and the loser amongst the nations

in the global geopolitics. An artist's representation of GEO-technology covering the three domains is shown in Figure 6 below:

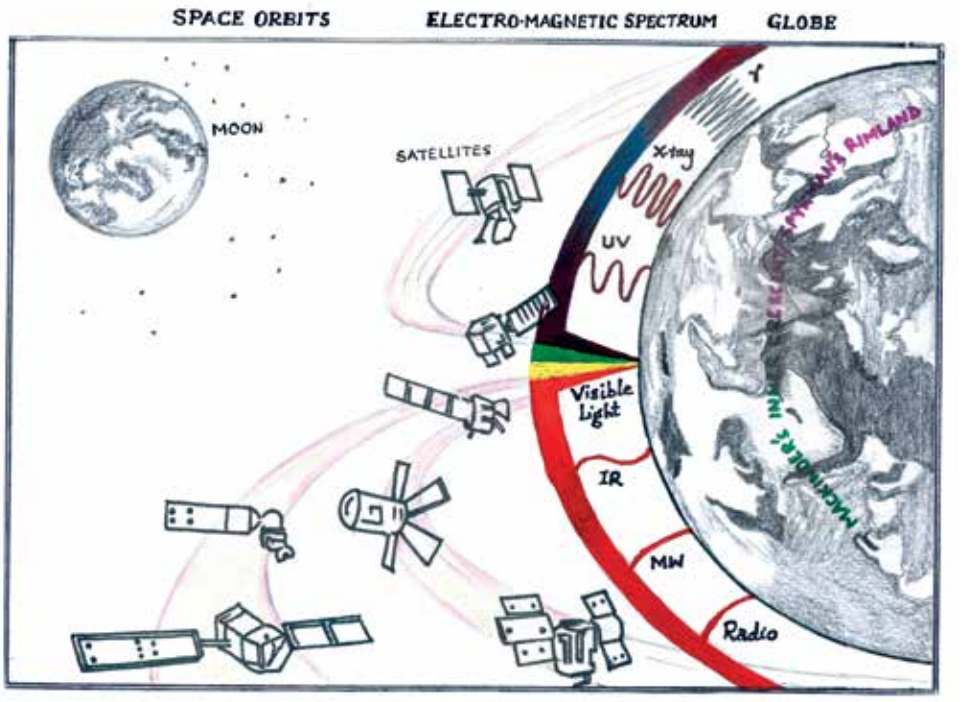


Figure 6: Artist's Representation of GEO-technology covering the Three Domains (Global, Electromagnetic Spectrum and Orbital)

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