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THE CONQUEST OF SPACE. FOR A REVIEW OF GEOPOLITICAL CONCEPTS.

Paolo Pane

Abstract

The last few years have been marked by a resumption of the strategic competition between the powers for the conquest of space, which has become a terrain of competition and an object of growing interest on the part of the main world players, creating a real geopolitics of space exploration that requires a reinterpretation in a modern key of some basic concepts of classical geopolitics, in particular on the concept of borders. The massive process of globalization that for decades has determined the political-economic geography of global space has already contributed to enriching the concept and role of borders, making it a matter of absolute relevance. A crucial aspect regarding the definition of the concept of border and its evolution over time concerns the progressive and ever increasing attention that global players, be they States or private individuals, have dedicated and dedicate to the conquest of orbital space. The traditional concept of international relations and geopolitics has, in fact, radically changed over the years: until the advent of new technologies in the air and space fields, all interactions took place on the earth's surface. Space therefore determines new geopolitical relations and new economic opportunities.

*Keywords***:** geopolitics of space; border studies; space economy.

1. Introduction

The last few years have been affected by a resumption of strategic competition between the powers for the conquest of space, which has become a terrain of competition and the subject of growing interest on the part of the main global players. China and the US, the European Union as in other dimensional domains, are the leaders of the competition to strengthen their position of strength in a competitive environment that has high economic and strategic implications. There is, therefore, a real geopolitics of space exploration that requires a modern reinterpretation of some basic concepts of classical geopolitics, first of all that of borders. In recent years, the debate on the concept of the border, in philosophical as well as in geographical and political terms, has acquired an unprecedented centrality, becoming the privileged object of various researches. The term, crucial in political geography for the understanding of global, regional and national dynamics, and for its multiple social, economic and political implications, is rich in meaning and susceptible to different declinations, especially

with respect to the scientific, historical and territorial context of reference. For many years, political geography has considered borders as a fixed and immutable fact (Paasi, 1999), which substantially determines human political history. This theory has its roots in Westphalian thinking of a central state exercising its sovereignty over a well-defined (*bounded*) territory in which a given population resides. The capacity of the border to define territorial belonging determines, in this perspective, the possession and exercise or not of a certain power and, consequently, the limit of this power (Zaman and Cosckun, 2015), which is clearly political. It is precisely its politico-legal dimension that differentiates the border from the concept of frontier[1]. It is a field that mainly privileges geographers, who were in an important position in redrawing the political boundaries between states during the post-war changes, but it is the object of analysis in many disciplines. In fact, for example, if we move within the sphere of defining the border as a natural entity, closely linked to the point of being determined by the morphology of the territory, we will find a series of elements of continuity. But if we refer, on the other hand, to certain spheres such as ethnicity, religion, traditions, we may find, on the contrary, considerable discontinuities. The traditional approach, generally used until the end of the 19th century and carried out by geographers such as Ancel (1936) and Hartshorne (1936), is a historical-geographical approach, which is based on the accumulation of empirical data in order to create detailed maps of the socio-economic structures of border regions. The development of these areas is represented through its changes in space and time. The morphology of the border is studied with a focus on the balance of political, economic and military power of the neighbouring states. The theory of natural borders as rigid demarcation lines is developed and then lost in importance.

The change in global space shows that the image of the border as a simple line is no longer able to convey the complexity of the contemporary world. In this sense, the imposing process of globalisation that for decades has been determining the political and economic geography of the global space, the emergence of new and ancient migratory phenomena, the affirmation of new and innovative tools in the field of communication, such as social networks, the rise of financial capitalism, a common and widespread universal sensitivity to the issue of human rights, the growing role of supranational bodies such as the European Union, have contributed to enrich the concept and the role of borders, making it an issue of absolute importance. In fact, despite the effects caused by these phenomena, which refer to a vision of a world without limits, the most recent news in the geopolitical sphere and not only, tells us of an increasing demand for stable and defined borders. Therefore, the issues related to the definition and perception of borders have attracted a multidisciplinary scientific interest ranging from political science to geography, from economics to urban planning, from law to theology, from which border studies[2] were born, in which investigations

1 Further differential points between frontiers and border are the following: the frontier is "outward-facing", i.e. towards the possibility and danger outside its territory, whereas the border is "inward-facing" and refers to the exercise of sovereignty and central power within a given geographical perimeter; the frontier is not self-evident, the border, to be such, must be real or at least reflect reality; the frontier is a manifestation of centrifugal forces, pushing outward, the border is characterised by centripetal forces.

2 In the European context, one example is the Centre for Border Studies at the University of Glamorgan. An overview of the spread of border studies is offered by the Association for Borderlands Studies (ABS), which publishes the biannual *Journal of Borderlands Studies*.

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that have started an intense experimentation of that interdisciplinarity identified as a necessary requirement for border research have converged (Cole and Wolf, 1999). The idea of the border, which for a long time was linked to the perception of a natural dimension defined by the morphology of the territory, has thus become the object of renewed scientific interest, which has generated a plurality of theoretical and methodological stimuli that has configured a real field of study that is expanding at a global level (Prescott, 1978). A particularly relevant contribution from this point of view is that offered by the development of US border studies, and by the various ethnographic, geographical, sociological, and legal research projects on the border between Mexico and the United States. Starting from the theorisations and cultural practices born on the aforementioned border, border studies have gradually come to the fore in Europe as well, presenting themselves as one of the newest and most complex areas of reflection in recent years. The question of borders initially emerged above all in studies on the western states of the continent, focusing on the study of the relationship between sovereignty and territoriality, between international legislation and the crossing of borders, not only of people, but also of goods and information. The progress of European integration has led to an evolution of reflection in this sense, particularly in the field of political science, which since the end of the 1970s has worked on aspects such as the specificity of the political and economic profile of border regions and cross-border cooperation (Battisti, 1996). The end of the Cold War gave further impetus to developments in border research. On the one hand, this event marked the dissolution of the division between East and West, whose impassability had been summarised by the image of the Iron Curtain, while on the other hand it opened the way to the multiplication of international borders with the emergence of numerous states in Eastern Europe, raising urgent questions about the mechanisms governing the emergence of new borders.

2. Borders in political geography.

A first scientific contribution on the subject of borders can be attributed to Friedrich Ratzel, one of the founding fathers of modern political and human geography. As early as the first volume of his *Anthropogeographie*, Ratzel related the distribution of human groups on the earth's surface and the characteristics of the territory, addressing, among other things, the concepts of coastline, island, and mobility. It is precisely from the analysis of mobility that the theme of borders, understood as political phenomena, which define the spaces of human groups, is addressed. Specifically, Ratzel (1882) deals with and defines the nature of borders in the fourth part of the first volume entitled The Borders of Peoples: "*Where the spread of an organic form stops, there is the border of it. The boundary thus consists of innumerable points at which an organic movement has stopped. As many as there are areas of diffusion of different plant and animal species, areas occupied by forests or covered by coral formations, there must be as many boundaries. Similarly, there are racial and ethnic zones and boundaries, and also political boundaries, i.e. those human groups that make up states. The origin*

of all these areas is the same, and resides in the movement that is proper to every living thing and that stops, either because of the lack of the conditions necessary for life, like the forest at a certain altitude in our mountains, like man in the snow-covered or icy areas of the polar and subpolar regions, or because of the resistance offered by a movement coming from another direction with which it has come into contact". Between the end of the 19th and the beginning of the 20th century, the German author reflected further on the concept of the border. In *Politische Geographie* (Ratzel, 1897), he dealt with the relationship between territory and state: "*Every state is a portion of humanity and a portion of territory. Man is unthinkable without the earth, and even less so is man's most distinguished work on our planet, the state*". In *Die Erde und das Leben: Eine verglei- chende Erdkunde* ("The Earth and Life: Comparative Geography"), Ratzel (1901a) defined the border of a state as a flap of an organism, not a line that separates. In fact, the border is a particular geographical space that on the one hand separates, but on the other hand unites. It can be defined as the location of points belonging to two or more different regions. Ratzel even tries to refute the idea of a natural and political border as a simple line (Scaramellini, 2007). The German geographer's work assigns, for the first time in geographic literature, great importance to the themes of borders, mobility, and forms of movement, which are used for the government of the territory. The border in Ratzel plays a significant role in the organisation of community life, as he defines the state as a portion of humanity and a portion of territory. Thus, Ratzel questioned the possibility that borders, especially on the level of political organisations, could consist of simple lines. On the other hand, in the same period, although in a different context, the idea of the mobile frontier had been developed by F. J. Turner (1921), who had reconstructed the formation of the United States of America based on the frontier paradigm. At the annual Congress of the American Historical Association, in 1893, he expressed an initial and significant reflection on the concept of the frontier. Thanks to the intuition of the frontier, the American historian was able to explain, in a convincing manner, the socio-cultural and economic-political dynamics that occurred in the United States until the end of the 19th century. In recent decades, the various schools of thought have developed significant differences between the concepts of border and frontier. In Italy the Trieste school has stood out for its studies on these topics. At the international level, it is mainly French and American geographers who have sparked an interesting debate. Both the border and the frontier certainly represent limits of a territory or parts in common between two territories or regions, where in the first case we refer to a line, in the second to an area. A recent declination of the term border, which tends to propose new forms of political and territorial organisation, going beyond the concept of the nation-state, is the concept of cross-border regions. Within these cross-border regions, the border becomes a line of contact, knowledge and even opportunity. It is within the European Union, for example, that this concept now takes shape. The territories that are part of it have the opportunity to adopt a more efficient system of functional relations without calling into question the authority or unity of the state to which they belong. In Europe, the so-called 'Euroregions' have been established since the 1970s as a result of the transfer of various competences from the individual states

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to the EU bodies and the related and increasingly evident defunctionalization of borders (Terrana, 2013).

3. New horizons for the study of borders: from terrestrial to orbital space.

A crucial aspect on the definition of the border concept and its evolution over time concerns the progressive and increasing attention that global actors, be they states or private individuals, have dedicated and are dedicating to the conquest of orbital space. The traditional concept of international relations and geopolitics has changed radically over the years: until the advent of new technologies in the field of aviation and space, all interactions took place on the surface of the earth. Space therefore determines new geopolitical relations and new economic opportunities. Recent years have seen a strengthening of the strategic competition between powers for the conquest of space, which has increasingly become a terrain of competition that goes beyond traditional boundaries, and follows new and different ways of interpreting and defining geographical space. In this regard, it is interesting to start with the theory of *Lebensraum* or living space according to Ratzel (1901b). From a purely geographical point of view, the concepts of position and space are important in this theory, in addition to the borders already mentioned (Hunter, 1983).

Location is the ultimate expression of determinist geography: it represents the physical location of a state and the natural resources linked to that territory. The development of the country and its relationship with other peoples is highly dependent on this. And the same position also influences the peculiar characteristics of the people who will occupy that place: it is this that determines the influence and the lines of development of the states. Another element on which political geography is based is *der Raum,* the space: it can be defined as the surface extension to which the life and evolution of the State is linked and represents the territorial ambitions of peoples and States (Lando, 2012). According to Ratzel (1901b), a state must constantly grow to maintain its vitality and obtain the necessary resources to support its people. And in this continuous and incessant growth it ends up meeting other states: the struggle for existence thus becomes a struggle for space, *Lebensraum*, the living space, that geographical area which is necessary to support a living species at its current demographic size. Thus Ratzel argued that the living space of a people consists not only of the place where its people live, but also the land from which they have always derived their livelihood, the area within which they have travelled and traded, the region around which plans for security against competitors are concentrated, giving prominence to the land from which the population obtains its material sustenance, given also the primacy Ratzel gave to agriculture. Today, however, in geopolitical dynamics other types of space, which the classical literature could not take into account, such as the orbital space as well as the virtual space, exist and are becoming increasingly important.

The geopolitical scenario, in which the exploration of space took its first steps, was not only that of a competition for scientific knowledge and the progress of humanity, which was promoted in the context of the International Geophysical Year of 1957-1958, but that of a real field of contention between the two victorious superpowers of the Second World War, the USSR and the USA, with the aim of affirming their respective strategic and military superiority over each other and at a global level (Spagnuolo, 2019). A fierce competition, not only in the arms and technology sector, but also in several other social and economic activities, such as sport, architecture, art, fashion, advertising, and space activities that will exert a great influence on the public, creating the Space Age (Panella, 2021). The Space Age was not only a set of scientific and technological, industrial, and economic factors, but it was also, and perhaps above all, the competition on superiority and cultural, aesthetic, and narrative contamination of facts and people. The competition led to growing research and experimentation in missile launch technologies, used not only for military purposes, but also as an indispensable tool to allow access to outer space and, thus, demonstrate technological superiority. Therefore, it became necessary, for post-classical geopolitics, a redefinition of space, and therefore of its borders, in the sense of its multidimensionality. More recently, Dolman (2001), taking his cue from the contributions of some classical authors, precursors of modern geopolitics, and projecting and transferring their theories into space, has given life to a branch of geography renamed by Dolman himself "astropolitik", that is, the study of the relationship between the physical and mechanical characteristics of extraterrestrial space, technology, and political-military strategies. Dolman takes his cue from Mahan's Theory of Maritime Power (Mahan, 1894), observing how its transposition into the space field attributes relevance, in a deterministic key with respect to the space race, to the availability of a geographical position suitable to allow launches at latitudes compatible with the orbits to be reached, or to the possibility of establishing control posts on the territory, for command and telemetry operations.

MacKinder's Hearthland Theory (MacKinder, 1904) also finds its interpretation in the spatial sphere, especially regarding the crucial passage according to which, if a state wishes to control global power but is unable to physically occupy strategic points on its territory, it must at least prevent these from being controlled by its adversaries.
In fact, even if it is true that there is not yet a wide literature on the power of space, it is however equally unquestionable that for now, and probably for a long time, the doctrinaire lines at the basis of Maritime Power can however be conceptually expressed also among the celestial bodies, in themselves not so foreign to the globalisation of commercial space, a place in all senses, moreover, no longer of state monopoly interest, but widely open to the world of private enterprise. This last aspect, which is particularly important and innovative, has given rise to a phenomenon described as the New Space Economy. In fact, if space exploration and exploitation started under the monopoly of States, the third millennium is showing a definite change, leading to a new role for private actors in the sector. This phenomenon is described as New Space, a new generation of companies using a new approach to collaborate with

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public or other private actors who share the huge risks and potential returns of investing in space (Achenbach, 2013). According to Space Foundation (2020), the Space Economy represents one of the most promising development opportunities for the world economy in the coming decades and includes public and private actors involved in the development, research and use of products and services, from the use of infrastructures to applications generated by scientific research. Therefore, we mean a new ecosystem based on an end-to-end approach and efficiency that drives the space sector towards a more business and service-oriented phase, thanks to the presence of specific factors or trends that have enabled and facilitated its full evolution (Iacovino, 2019). Firstly, it seems appropriate to recall how the growth forecasts for the space industry can justify the entry of private players into the sector. According to OECD (2019a), the market for space activities was worth around $350 billion in 2018, with a projected move to between $1.1 and $2.7 trillion in 2040. Today, some further consideration needs to be given to the potential impact of the COVID-19 pandemic on the industry, which has severely affected, if not disrupted, global supply chains and international trade. Although not as directly affected as other segments, such as tourism, the space sector is bearing the consequences of the pandemic. But thanks also to its diversification, it can be said that the space sector is showing some resilience to the effects of COVID-19, mainly due to the presence of institutional actors supporting its demand (Scatteia and Perrot, 2020).

Through national programmes, bilateral cooperation and participation in international projects, Italy is one of the few nations in the world to have a space and aerospace sector characterised by a complete chain of products and services. This significant strategic autonomy has enabled Italy's industry to develop excellent expertise and very strong competitiveness on the international market in the development and production of products and services. The OECD (2019b) stimates that Italian industry consists of approximately 500 players distributed as follows: 54% in Northern Italy, 23.4% in Central Italy, 19.5% in the South and the remaining 3.1% on the islands. Lombardy is the leading region in terms of number of companies with 18.7% of the total, followed by Latium, Campania, Piedmont, Emilia-Romagna, Veneto, Liguria, Tuscany, Apulia, and Friuli-Venezia Giulia. Around 60% of these companies specialise in the production and/or repair of aircraft and spacecraft, while the remaining 40% are involved in the production of radar, flight recorders and engine control instruments. The aerospace industry is therefore an important driver of current and potential development for the Italian economy, and for southern Italy in particular. Moreover, the aerospace sector is among those that suffered less from the effects of the 2007 crisis (SRM, 2015) and could therefore potentially play a significant role in the recovery from the current economic crisis due to COVID-19. This will clearly be the case if the sector is able to intervene in the short term on production processes, to promote efficiency and keep selling prices down compared to competitors, activate synergies with growing markets (especially in Asia), increase the degree of internationalisation and, finally, consolidate the contribution of artificial intelligence in production and decision-making processes. To this end, however, it will also be necessary to exploit

the different geographical positions of Italian districts. While the southern regions face the Mediterranean, an area of great prospective development, those in the north are projected towards Eastern Europe, which has been experiencing considerable industrial development for decades. It is therefore important to encourage a greater degree of integration between companies throughout the country, trying to reduce the productive and infrastructural imbalance between North and South. For this reason, it is necessary to launch regional, national and EU policies that share a strategic vision for the sector, promoting the growth and development of the various centres of excellence, and coordinating the territorial experiences of the individual aerospace districts. In this context, public administrations and entrepreneurs in southern Italy should consider this sector a key tool both for the economic and social revival of their territories and for making full use of the human capital and skills present there.

Thus, the rapidly changing global space context, the increase in international competition, the emergence of new operators, and the growing economic and commercial nature of space, all imply new challenges and new thinking. A particularly controversial issue concerns precisely a new definition of the boundary that can be combined with the growing importance of the use of space, particularly in the distinction between airspace and outer space. In fact, if the definition of a space boundary is to be considered a purely scientific matter, the need to determine a boundary between airspace and outer space appears relevant in the light of the political and economic implications (Cheng, 1962). This need already arose in 1958, within the United Nations, on the establishment of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)[3]. At present, there is still no unambiguous definition and, as a result, various doctrines and schools of thought have emerged which have attempted to provide an answer to the problem. In this context, we can identify different approaches or theories on the delimitation of outer space. A first theory, defined as spatialist (Ancis, 2019), has tried to identify a boundary, declined as a demarcation line between airspace and cosmic space. This approach inevitably encounters a series of problems from both a strictly geographical and legal point of view. In fact, for example, an aerospace vehicle may need to access (suborbital) space for a short time, while carrying out its main activity in airspace. Moreover, what makes the identification of a linear boundary difficult to apply are the important differences between aviation law and space law. Indeed, according to Article 1 of the ChicagoConvention[4], the airspace above the territory of a State is subject to its complete and exclusive sovereignty, whereas Articles 1 and 2 of the Outer Space Treaty[5] prohibit the State from exercising any form of territorial sovereignty in space.

3 It was established in 1959 by Resolution 1472 (XIV) adopted by the United Nations General Assembly. It is the main intergovernmental forum for the development of international legal principles for activities in outer space.
4 Convention on International Civil Aviation, signed in Chicago on 7 December 1944 and entered into force on 4 April 1947.
5 Treaty of 27 January 1967 on the Principles Governing the Activities of States Relating to the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, entered into force on 10 October 1967.

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In addition, the application of aeronautical law to all objects passing through airspace is in partial contradiction with international law, since many provisions of aeronautical law apply only to aircraft, while some provisions of international space law extend their scope to space objects passing through airspace (Chatzipanagiotis, 2012). For these and other considerations, therefore, the spatialist theory, based on a linear conception of the boundary, does not appear to be able to provide an adequate solution to the problem of delimitation between airspace and outer space.

A second approach, the functionalist one (Jakhu et al., 2011), tries to solve the normative problem by approaching the issue from a different point of view. In fact, this theory tries to go beyond the concept of a linear boundary, focusing no longer on the identification of a physical place, but on the type of vehicle used. In order to identify the type of vehicle involved, consideration is generally given to its purpose, activity or destination. If the main purpose of the vehicle is to go into outer space, then the vehicle will qualify as a space object and space law will prevail. Conversely, if the main purpose of the vehicle is to provide transport from one point to another on Earth, the vehicle will qualify as an aircraft, and aviation law will prevail. It is clear, therefore, that functionalist theory would be effective in overcoming mainly legal issues. It should also be pointed out that some aspects of the issue have already been resolved by customary international law, according to which airspace lies below 100 km from sea level, and above 100 km begins outer space (Vereshchetin and Danilenko, 1985). However, the existence of such a numerical or quantitative limit on the delimitation of outer space is not accepted by many States and is not shared by many scholars who believe that, although there is a rule of customary international law that recognises the lowest altitude of satellite orbit, it does not mean that such international custom recognises this altitude as the boundary between outer space and airspace. Moreover, it should be emphasised that the problem of delimiting such a boundary is essentially a political issue; in this perspective, legal profiles are relegated to the background, with only the law being able to intervene when a normative solution is formulated.

4. Conclusions.

Nowadays, as we have already said, a certain idea of globalisation would tend to make the concept of the boundary marginal, to the point of making us ask ourselves if and to what extent the debate on boundaries is still current and relevant for Geography and for the other disciplines that have been confronted with this issue. There is no doubt that the debate on the border remains central to contemporary geographical research as the related scientific debate is still very lively and full of new insights. One of the effects of globalisation, a phenomenon that brings together political and economic actors and consumers of goods and services on a global scale, is to reduce distances. The distance between two places is now measured not only by physical space but also by travel time. This leads to a change in the map and its scale. Compared to the basic

cartography, a study by Espon (2004) assumed a cartographic representation in which the compression of space from 1993 to 2020 is evident due to the spread of, among others, high-speed railways. All this would lead one to think that a reduction in space, understood as travel time, would correspond to a reduction in borders. On the contrary, in recent decades borders have even increased, even within individual urban areas or sub-regional territories. Even with regard to the phenomenon of migration, which often finds its most important moment in the crossing of a border, the most recent processes of globalisation do not tend to determine a world without barriers, but have contributed to giving new directions to the concepts of citizenship, inclusion and sovereignty, in which the border has often become the scene of clashes and violence.

From an administrative point of view, the increase in the number of borders has clearly occurred as a result of autonomy drives that have led to the formation of many independent states from larger territorial units. One thinks of the many proclamations of independence from the Soviet Union since the early 1990s, or of the break-up of the Socialist Federal Republic of Yugoslavia, which led to the formation of seven independent states. Even the process of European integration, which through the 1995 Schengen Agreement and the decisions on enlargement to the east following the 2002 Copenhagen Summit gave the green light on the one hand to free movement and on the other to a major expansion of the EU's borders, has not erased the different levels of internal borders. On the contrary, it may have accentuated a certain nationalist sentiment, as is especially evident in recent years due to economic crises. Another issue that refers to the emergence of new borders is the digital divide, i.e. the inequality of access to information and information technology. The digital divide is a phenomenon that affects the development and freedom of peoples, and is itself a border that usually coincides with the borders of states or continents, the effect of globalisation that is making certain territories increasingly marginal. The need for new borders and new regions emerges forcefully even if we refer to all those local development policies that have affected and continue to affect areas that are generally sub-regional in size, as has happened, for example, in some Italian areas since the 1990s through Integrated Territorial Projects (IPPs), territorial pacts, industrial districts or, more recently, tourist districts. From this point of view, the partition of the territory, i.e. the identification of new sub-regional boundaries, given the qualitative and quantitative change of the actors involved in the local development proposal, takes on important functions and meanings that do not only concern the objective of striving for maximum administrative efficiency. Therefore, the importance of the study of boundaries, which this work certainly cannot claim to have concluded in an exhaustive manner, is still relevant and capable of describing phenomena and trends of our contemporary world.

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