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HISTORICAL AND LEGAL DRIVERS OF SPACE LAW

Abstract

The article aims to determine the prerequisites and factors in space law during the first half of the twentieth century that contributed or might contribute to the development of space law. **The methodological basis** of the article is a set of principles and modes of knowledge, the choice of which was defined by interdisciplinary approaches to the disclosure of the subject, objectives, and the specifics of the aim. Historical-legal, formal, analytical, critical and comparative research methods were used in the research process. **The scientific novelty** consists in the fact that unlike general studies of the biographies of lawyers in the sphere of space law during the first half of the twentieth century and the history of the specific legal acts on space law and the legal analysis of these acts, the present study is an interdisciplinary (historical-legal) study of historical-legal aspects that became a background for the process of legal regulation of space activities and formed the scope of certain goals and tasks set before the international community at the beginning of the development of space law. **The results of the study** of the historical and legal factors of the legal regulation of relations in outer space made it possible to find out that at the beginning of the second half of the twentieth century, the prospects of scientific and technical progress and the results of the research of the world`s leading lawyers already necessitated the development of a new field of law – namely, Space Law, which cannot have any analogies with air and maritime law. In addition, at that time, a list of the main issues and tasks that required addressing during the development of the provisions of Space Law, and which can be considered the basis for analyzing the evolution of this law, was already formed.

Key words: space law, outer space, history, theory of the state and law, evolution of law

ІСТОРИКО-ПРАВОВІ ЧИННИКИ ФОРМУВАННЯ КОСМІЧНОГО ПРАВА

Анотація

Метою цієї статті є визначення передумов і факторів першої половини двадцятого століття в галузі космічного права, які вплинули або могли вплинути на розвиток космічного права. **Методологічну основу** статті становить сукупність принципів та способів пізнання, вибір яких визначався міждисциплінарними підходами до розкриття теми, поставленими завданнями та специфікою мети. У процесі дослідження були використані історико-правовий, формальний,

аналітичний, критичний і порівняльний методи дослідження. **Наукова новизна** статті полягає в тому, що на відміну від загальних досліджень біографій юристів першої половини двадцятого століття та історії створення окремих правових актів з космічного права і правового аналізу цих актів, дане дослідження є міждисциплінарним (історико-правовим) дослідженням історико-правових аспектів, які стали передумовою процесу правового регулювання космічної діяльності та сформували обсяг певних цілей і завдань, поставлених перед міжнародною спільнотою на початку розвитку космічного права. **Результати дослідження** історично-правових чинників правового регулювання відносин у космічному просторі дозволили з'ясувати те, що на початку другої половини двадцятого століття перспективи науково-технічного прогресу і результати досліджень провідних юристів світу вже зумовили необхідність створення нової галузі права, а саме – Космічного права, яка не може мати жодних аналогій з повітряним і морським правом. При цьому в цей період вже сформувався перелік основних питань і завдань, які потребували свого вирішення під час розроблення положень Космічного права та які можливо вважати основою для аналізу еволюції цього права.

Ключові слова: космічне право, космос, історія, теорія держави і права, еволюція права

Introduction

Regulating space activities began in the 50s of the XX century, thereby the relevant branch of law is considered a very young science.

At the same time, most scientists inextricably link the history of outer space law with the beginning of activity in outer space of the Earth, namely, with the launch of the first Earth's artificial satellite beyond the limits of air space into Earth orbit by the Union of Soviet Socialist Republics in 1957.

In this regard, the history of outer space law is usually divided into two main stages: theoretical and scientific research by legal scholars in the direction of regulating future outer space activities in the period up to 1957 and the direct formation of outer space law after 1957 based on interstate treaties and international legal acts adopted at the initiative of the UN General Assembly.

To date, scientific works describe the history of the development of outer space activity and the related history of the activities of scientists and lawyers in the first half of the twentieth century, who investigated the future problems of space activity, generated challenging ideas, and even proposed certain legal options for regulating outer space activity.

Additionally, many scholarly works investigate the history of the creation of certain legal acts of space law adopted after 1957 along with the legal mechanisms of these acts and the history of space law after 1957.

In turn, according to the authors, the fact that the Union of Soviet Socialist Republics launched into Earth orbit the first Earth's artificial satellite in 1957 played a significant role, although it is not the only and determining driver in the process of development of space law.

It`s more than likely that the launch of the Earth's artificial satellite became a certain trigger that started the international mechanism for developing legal acts to regulate space activities.

In the authors` opinion, the form and content of such legal acts were primarily influenced by the ideas and research results of scientists of the first half of the twentieth century.

Moreover, over a long period, these studies gradually formed a certain number of goals and tasks that required a legal solution, leading to the creation of space law in its modern format.

However, as of today, there are no interdisciplinary (historical-legal) studies of the factors that were formed at the beginning of the second half of the twentieth century and directly influenced the formation of outer space law. The lack of such studies hinders the full determination of the prerequisites of the process of legal regulation of outer space activity, its consistency and logic, as well as the fulfillment of the goals and tasks set by scientists at the beginning of the development of outer space law.

Moreover, the modern technological development of the space industry has already revealed many shortcomings and loopholes in space law, which occurred as a result of neglecting the historical and legal factors that existed at the beginning of such development.

In turn, the analysis of historical-legal aspects that became a prerequisite for the process of legal regulation of outer space activities along with the identification of the scope of goals and objectives set before the international community of lawyers at the beginning of the second half of the XXth century will allow to more effectively evaluate and analyze the further process of evolution of outer space law, its progress and flaws.

Analysis of the latest research and publications

As of this date, there are scientific works that contain the history of outer space activities along with the history of legal scholars activities in the first half of the XXth century, who studied the problems of regulating aviation and space activities.

Such works include articles and books written by Hobe S. (2013), Kopal V. (2013), Lai A. K. (2021), Chertok B. E. (2006), Diederiks-Verschoor I. H. P. (2008), Doyle S. E. (2013), Fenema van P. (2013), Masson-Zwaan T. (2013) and others.

However, these studies mainly concerned the history of outer space activity or the biography of legal scholars of the first half of the XXth century, without establishing a historical-legal connection between the results of their scientific activities and the subsequent process of outer space law formation and development.

The article aims to determine the prerequisites for the emergence of outer space law, in particular, the results of the scientific activity of legal scholars of the first half of the XXth century in the field of outer space law, which influenced or might influence the development of outer space law.

The main objectives of the article are the analysis of the fundamental results of the legal scholars` activity of the first half of the XXth century in the field of regulation of outer space activities, coupled with the systematization of specific goals and tasks of outer space law, which were formed at the beginning of the second half of the twentieth century and required a legal solution in the process of outer space law development.

Methods and methodology of the study. The research methodology is based on the principles of objectivity and systematicity and includes historical-legal, formal, analytical, critical, and comparative research methods.

1. The statement of the basic research material

In the studied retrospective, cosmonautics can be immanently determined as a young science, although such an attitude to this science is conditional.. A large number of ancient sources testify to the fact that attempts to study, learn and explore the Cosmos have very ancient roots.

As early as the third millennium BC, the ancient Egyptians carried out rather complex mathematical, astronomical, and physical scientific studies of the Cosmos (outside the Earth). Moreover, even at that time, it was known about the existence of cosmogonic theories of the origin of life on Earth, people, and the Universe(Cherniy 2005, 60–61), which increasingly resemble scientific hypotheses put forward by modern physics and astronomy.

Over time, the passion for the philosophical and scientific study of the Cosmos began to fade, and mankind lost a significant body of ancient knowledge.

It is possible to consider the period of development of various sciences about the Earth, mathematics, astronomy, philosophy, and other sciences in Ancient Greece in the 6th – 4th centuries BC as the next stage of the scientific research of the Cosmos.

Thus, in the 6th century BC, Ἀναξίμανδρος from Miletus (lived around 610-546 BC) discovered “the law of Conservation of Matter”(Kahn 1960, 33–34, 36–37) and set forth his

"Cosmogony"(Kahn 1960, 33–34, 36–37), as well as his legendary theory – "the theory of primal matter"(Seligman 1962, 12–17) called "ἄπειρον", which was laid out in the treatise "On Nature"(Seligman 1962, 12–17).

Further, Δημόκριτος from Abder (lived around 460-370 BC) made public the theories of "The Void" and "The Atomism"(Taylor 1999, 157–60), which were presented in works "The Great World-System"(Taylor 1999, 157–60), "On the Planets"(Taylor 1999, 157–60), "Heavenly Causes"(Taylor 1999, 157–60), "Description of the Heaven"(Taylor 1999, 157–60), "Terrestrial Causes"(Taylor 1999, 157–60), etc. Εὔδοξος from Knid (lived around 408-355 BC) put forward his planetary-spherical theory(Linton 2004, 25–26), proposing to consider the shape of the Earth and other cosmic objects in the form of a sphere. His works have not reached us, but are mentioned in the mathematical "The Elements"(Lasserre 1966, 157–60, 179–80) by Εὐκλείδης. The completion of the cycle of ancient cosmological research can be considered the creation of the theory of geocentric cosmology by Aristotle (who lived around 384-322 BC), which was presented in works "On the Heavens"(Barnes 2000, 97–98), "Physics"(Barnes 2000, 97–98) and "Meteorology"(Bostock 2006, 132).

Thereafter, in the second half of the 4th century BC, the stage of conquering wars of Alexander the Great began, which eventually turned into the Diadochi War(Zelinskyy 2020, 35–69). Later, the confrontation between the Greek states and the state of Rome along with the subsequent expansion of Ancient Rome into Europe, Africa, and Asia and the formation of the Roman Empire started(Freeman 1999, 337, 381–83, 396–98). From the end of the 4th century BC to the beginning of the 4th century AD, effectively, the history of the Mediterranean countries was marked by global colonial wars, and non-military science took a back seat.

It is even possible to notice that during the mentioned period there was a certain decline in the development of the sciences of the universe, although there is information on the attempts of Ἀρχιμήδης (lived around 287 – 212 BC) to calculate the angular diameter of the Sun and build a planetarium ("heavenly sphere"), and also about the attempts of Ποσειδώνιος (lived around 135 – 50 BC) and Ἐρατοσθένης from Cyrene (lived around 276 – 194 BC) to determine the dimensions of the globe and on the creation by Claudius Ptolemy (lived around 100 – 170 AD) of the encyclopedia of astronomical and mathematical knowledge of the ancient Greek world.

However, these studies of the κόσμος were not of a large-scale nature.

At the beginning of the 4th century AD (from 313 to 337 AD), with the transformation of Christianity from a forbidden religion into the official religion of the Roman state (on the initiative of ruler Constantine I), Christianity began an aggressive struggle with pagan cults(Vandorpe 2019, 415), which also included all philosophical and astronomical teachings about the universe. Thus, with the spread and establishment of the Christian religion in Europe, the study of the Cosmos began to acquire a non-scientific and purely religious character, which lasted until the 15th century AD.

The period from the 15th century AD to the beginning of the 19th century AD can be considered the next stage of scientific research into Outer space, which was marked by the research of Giordano Bruno (lived during 1548 – 1600), Galileo Galilei (1564 – 1642) and the creation of the theory about the heliocentric system of the world, outlined in the work "*De revolutionibus orbium coelestium*"(Gingerich 2005, 60–61, 69, 108) (the author's translation: "On the rotation of the celestial spheres") by Polish scientist Nicolaus Copernicus (lived in the period 1473–1543).

However, in a certain sense, it is possible to determine that the period that began in the first quarter of the 19th century AD and continues to this day is the period of practical Outer space research.

The initial stage of the above-differentiated period was specified by the creation of a formula that established the dependence between the speed of the rocket at any moment of its motion, the speed of gas outflow from the nozzle, the mass of the rocket, and the mass of explosives (rocket equation). The first attempts to develop this formula were made back in 1810 by British mathematician William Moore in the article "On the motion of rockets both in Nonresisting and Resisting Mediums"(Moore 1810, 276–84). The scientific work "Kinetic theory of gases" by Scottish mathematician and physicist Peter Guthrie Tait, published in the period 1886-1892, also made an important contribution to space research(Knott 1911, 109–13), as well as scientific works published in 1897 and 1904 by Russian scientist Ivan Vsevolodovich Meshchersky "Динамика точки переменной массы"(Wolny and Strzałka 2019, 476) (the authors` translation: "Dynamics of the point of variable mass") and "Уравнение движения точки переменной массы в общем случае"(Wolny and Strzałka 2019, 476) (the authors` translation: "Equations of motion of the point of variable mass in the general case"), which contained "equations of bodies of variable mass"(Wolny and Strzałka 2019, 476) (named as Meshchersky`s equation), which became the basis for deriving the rocket formula in the future. The specified formula took(Diederiks-Verschoor and Kopal 2008, 1) its final form in 1897 in the manuscript of Polish-Russian scientist Konstantin Tsiolkowski (lived from 1857 to 1935), published in 1903. In commemoration of the first publication, such a formula was called the "Tsiolkovsky rocket equation".

Despite the shortcomings of the above formula, it is possible to state the beginning of the era of practical space exploration.

Simultaneously, during this period, various processes in the field of regulation of space activities begin to emerge.

In particular, in 1908, Alex Meyer published two scientific and legal works under the titles "Die Erschließung des Luftraums und ihre rechtlichen Folgen"(Hobe 2013, 5–6) (the authors` translation: "Legal consequences of the "opening" of air space") and "Freiheit der Luft als Rechtsproblem"(Hobe 2013, 5–6) (the authors` translation: "Freedom of the air as a legal problem"), in which the need to regulate any flights over the Earth is outlined. Further, on September 5, 1952, at the Third International Astronautical Congress in the city of Stuttgart (Germany), Alex Meyer conveyed the report raising the issues of the legal status of outer space and celestial bodies, the possibility of military use of outer space and the problem of space war, as well as the issue of international mutual assistance in space activities(Hobe 2013, 8) and the use of outer space for the placement of space stations(Hobe 2013, 12). At the same time, Alex Meyer was the first to point out the need to delimit air and outer spaces(Hobe 2013, 9) and the absence of any analogies between space law and air and maritime law(Hobe 2013, 9).

In 1932 Vladimir Mandl published the first study on the so-called "space law" under the title "Das weltraumrecht, ein problem der raumfahrt"(Kopal and Hofmann 2013, 62) (the authors` translation: "Space law: problems of space flights"), in which he determined the need to establish responsibility for the consequences of future space activities.

Futher, in 1953, Welf-Heinrich Prince of Hanover, published his doctoral thesis "Luftrecht und Weltraum"(Diederiks-Verschoor and Kopal 2008, 1) (the authors` translation: "Air Law and Space"), in which he outlined the theoretical problems of regulating space activities.

Whereas, one of the first practicing lawyers in the field of space law was Andrew G. Haley, who was involved in the establishment of a number of companies and associations related to aerospace activities, as well as in the resolution of many issues related to the use of telecommunications, the definition of space jurisdictions, subjects and objects of

space law and space activities, etc, and even proposed to define the boundaries of state jurisdictions by the height where aerodynamic lift disappears (275,000 feet or 52 miles above sea level)(Doyle 2013, 71, 90). However, Andrew G. Haley is better known to lawyers for his fundamental work "Basic Concepts of Space Law"(Doyle 2013, 90–91), published in 1955, in which he even suggested the need to take into account in space law the possibility of meeting extraterrestrial intelligent beings.

A significant contribution to the development of space law, as a separate field of law, was also made by the outstanding lawyer and scientist Eugène Pépin, who in 1957 founded one of the first departments of "air and space law" at McGill University(Kerrest 2013, 27), and during a lecture delivered on November 6, 1957, before the Canadian Bar Association, stated that the sovereignty of states over air space cannot extend to outer space and spacecraft, thus defining the problem of space jurisdictions(Kerrest 2013, 27). Subsequently, Eugène Pépin repeatedly drew attention to the importance of ensuring the availability of orbital space for all countries and the peaceful use of space, as well as the need to regulate space traffic, register outer space vehicles, and establish responsibility for the consequences of outer space activities(Kerrest 2013, 28–29). At the same time, Eugène Pepin already at that time predicted the possibility of the creation of space debris, which would hinder flights into outer space(Kerrest 2013, 29). The main result of his activity was the establishment of one of the most important scientific organizations in the field of outer space law – the "International Institute of Space Law"(Kerrest 2013, 31) in London (IISL).

A huge intellectual contribution to the development of air and space law was made by John Cobb Cooper, the founder and first director of the Institute of Air and Space Law at McGill University in Montreal (Canada). In 1951, John Cobb Cooper outlined the issue of national jurisdictions and proposed to define the jurisdiction of states in a vertically unlimited three-dimensional space (the territory of the earth – the space under the earth – the entire space in outer space above the earth), but later assumed the need to limit the upper sector of jurisdiction to the limits of airspace and the possibility of its control by states, and to make outer space free for exploration by all states(Jakhu and Ancona 2013, 40–41). In addition, he was confident that maritime law is the basis for the Space Law development(Jakhu and Ancona 2013, 45). In 1961 John Cobb Cooper also drew the attention of the international community to the necessity to register spaceships launched into space and determine the nationality of each space vehicle to establish state responsibility for the consequences of space activities in outer space(Jakhu and Ancona 2013, 45). However, his main contribution was constant lobbying for the common interests of humanity in outer space and the use of outer space only for peaceful purposes(Jakhu and Ancona 2013, 42).

Soviet legal scholars also participated in the development of space law, among whom the most outstanding was Evgeny Aleksandrovich Korovin, who from 1935 to 1961 published more than 150 theses and articles on the application of international law in space activities, the concept of sovereignty in international law in the implementation of space activities, the development of the principle of peaceful cooperation in space, and much more(Zhukov, Vereshchetin, and Kapustin 2013, 53–54).

In addition, it is necessary to mention Daniel Goedhuis, who made a lot of efforts to protect peaceful space and define air-space sovereignty(Fenema and Masson-Zwaan 2013, 109, 120), and Eilene M. Galloway, who was directly involved in 1958 in the preparation of the National Aeronautics and Space Act and the creation of NASA, as well as in the creation of the U.N. Committee on Peaceful Uses of Outer Space (COPUOS) and the formation of the International Institute of Space Law(Smith and Galloway 2013, 128) in London. However, it should be noted that Eilene M. Galloway significantly influenced the refusal of the United

States of America to conclude the international Moon Agreement and demanded from the United Nations more specific formulations and interpretations of the terminology of this agreement and the conditions for using the Moon(Smith and Galloway 2013, 139).

Separately, it is worth noting the brilliant theorists of the cosmic law of that time, such as C. Wilfred Jenks, who as early as 1956 stated the need to define the fundamental principles of space law and regulate the process of extracting minerals in space(Freeland 2013, 172), and Rolando Quadri, who already in 1957-1959 made a significant contribution to the study of international space law and issues related to sovereignty, space navigation, military use of space, determination of the status and ownership of space vehicles, the demarcation of air and outer space, the terminology of outer space law, as well as the fight against the patrimonial nature of outer space law(Marchisio 2013, 153, 161–62). At the same time, Rolando Quadri differed from other researchers in that he was not afraid to ridicule general, meaningless international legal acts that did not have a specific character and legal concepts regarding the unlimited sovereignty of states in space. In particular, he criticized the concept of state sovereignty "*Usque ad sidera*" (the authors` translation: "up to the stars"), calling it the concept "*usque ad absurdum*" (the authors` translation: "up to the absurd"), justifying this by the fact that no state can establish order and control in the boundless outer space(Marchisio 2013, 158).

In general, outlining the space technological and legal activity of the 40s and 50s in the studied discourse, it is possible to state that this period already marks the beginning of the international space technological and space ideological race.

First of all, it should be emphasized that the process of launching rockets into space immediately after the Second World War can no longer be considered something unusual or surprising. For instance, the United States of America and the Union of Soviet Socialist Republics by this time had been already capable of launching scientific instruments up to an altitude of about 130 miles above sea level with the help of captured German V-2 rockets, and by 1949 the United States of America had even managed to reach an altitude of 244 miles (about 392 kilometers) above sea level(Lai 2021, 7). Moreover, the United Kingdom of Great Britain developed its own Skylark rocket, capable of reaching an altitude of about 130 miles above sea level(Lai 2021, 7).

However, the issue of launching satellites into space, and especially humans, was still unresolved and the two superpowers of the time, the United States of America and the Union of Soviet Socialist Republics, began their race by announcing programs to launch satellites into space in 1954-1955(Lai 2021, 7). At the same time, all competitors understood that launching a satellite into space means not only the advantage of technological progress but also the advantage of the ideology that managed to achieve such technological progress(Chertok 2006, 2:46–47).

In this regard, Professor John Cobb Cooper suggested that all states hold an international conference to define outer space, identify and limit national sovereignty, and establish the right of satellites to pass through the territory of other countries(Lai 2021, 13). In addition, he proposed to establish the outer limit of the sovereignty of states at an altitude of 300 miles above sea level, beyond which satellites could freely pass over other countries(Lai 2021, 14). However, at this stage, the states could not agree on the rules of space activity.

In turn, during this period, the leadership in the space race was seized by the Union of Soviet Socialist Republics. Already in 1955, Soviet engineers, including Ukrainian and Soviet scientist Serhii Pavlovich Korolev (1907-1966), created the R-5 rocket, the flight range of which was 1,200 kilometers, and in February 1956, the R-5 missile with a nuclear warhead was launched (without initiation), which immediately raised the question of the use of nuclear weapons in outer space(Lai 2021, 18).

In the future, despite the significant political opposition of the party elite of the Soviet Union, Sergey Korolev was the first to develop and create a multi-stage space rocket, namely a rocket with three- and four-stage launchers based on the single-stage prototype of the R-7 rocket(Chertok 2006, 2:230, 232, 278, 386, 415, 416, 435, 437), that on October 4, 1957 allowed the first artificial satellite in human history to be launched into Earth orbit(Lai 2021, 7, 17, 20). This launch caused a shocking response because the satellite called "Sputnik 1" weighed 84 kilograms(Chertok 2006, 2:380–85), while the United States of America was just working on putting a 10-kilogram satellite into outer space(Smith 1982, 354). However, the uproar had not yet died down, as on November 3, 1957, the Union of Soviet Socialist Republics launched a satellite called "Sputnik 2" weighing 508 kilograms with the first animal (dog Laika) on board(Smith 1982, 354)(Chertok 2006, 2:390). In 1958, with the direct participation of Sergey Korolyov, a geophysical satellite named "Sputnik 3" was developed and launched into outer space, and later also a pair of "Electron" satellites for the study of the Earth`s radiation belts(Chertok 2006, 2:395, 400).

The corresponding success of Soviet engineers can be explained by the fact that in the Union of Soviet Socialist Republics, unlike other countries, the organization of spacecraft launches into outer space was carried out only by military state bodies that had the appropriate technologies and resources.

In turn, the United States of America managed to put its first research satellite into orbit only on January 31, 1958, with the help of the "Jupiter C" spacecraft(Smith 1982, 354). Even though it was a joint military-civilian state project, already from this moment in the United States of America there was a division of outer space activities into civil and military by defining different goals for the National Aeronautics and Space Administration and the Department of Defense(Donald 1961, 11, 15, 18, 19). Military space launches were organized by military government agencies under the Department of Defense (or DOD), while civilian research outer space launches were conducted by civilian government agencies under the National Aeronautics and Space Administration(The National Academy of Sciences 2010, 22), based on the National Aeronautics and Space Act or NASAct, adopted in 1958(Smith 1982, 354).

The further development of space activity progressed with impressive speed.

Already in 1958, the Union of Soviet Socialist Republics launched a program to send an artificial module to the Moon(Chertok 2006, 2:416, 436–37), and on April 12, 1961, with the help of the "Vostok" spacecraft (based on the "R-7" rocket), sent the first astronaut into space – Yuri Gagarin, thus starting the era of human space exploration(Chertok 2006, 2:x, 110, 187).

In response to the actions of the Union of Soviet Socialist Republics, in 1961 the administration of President of the United States of America J. Kennedy directed NASA to achieve the goal of landing a man on the moon and returning him safely to Earth(Chertok 2006, 2:4). These prospects put before humanity another list of questions related to the need to regulate activities on the Moon.

In the end, scientific and technical achievements and legal research in the field of space, already at the beginning of outer space activity, resulted in the necessity of clear regulation of relations between participants of outer space activity.

At the same time, it was considered quite reasonable that the existing international documents (for example, the IKAO 1944 Chicago Convention on International Civil Aviation(*The Convention on International Civil Aviation (Signed in Chicago)* 1944) could not regulate relations regarding the use of spacecraft, in particular, because they related only to "aircraft", and the concept of "spacecraft" (or "space vehicle") did not meet the requirements of the definition of "aircraft" enshrined in air law(Diederiks-Verschoor and Kopal 2008, 3–4).

At the initial stage, the states that participated in the space race (first of all, the Union of Soviet Socialist Republics and the United States of America) developed their regulations regarding outer space activities(Jakhu 2010, vi–vii, 315–16, 421). However, the jurisdiction of such regulations extended only to the territory of the respective state.

In this regard, in the late 1950s and early 1960s, the international community faced the need to solve problems and issues that arose as a result of the rapid development of scientific and technological progress and which were made public by leading lawyers in the field of international law, which, in turn, necessitated the creation of general law to regulate outer space state and private activities.

2. Conclusions and prospects for further research

In the process of updating the historical and legal factors of the legal regulation of relations in outer space, it was found that the process of studying and researching outer space has been going on for a long time and goes back to ancient times. However, the first stage on the path of technical space research began only in the 19th century AD, and the doctrine of space law began to be formed based on the proposals of legal scholars only at the beginning of the 20th century AD, which defines it as a young legal science.

However, despite the efforts of scientists, space law could not establish itself as a separate branch of law in the first half of the 20th century AD, because outer space had not yet become an object available for use by mankind. In this regard, the period that began in the second half of the 20th century AD can be called the main stage of the study of outer space and the formation of outer space law – this is the period of primary practical research and use of outer space (in particular, the first flight of a human into outer space) when it became impossible to do without legal norms.

In turn, one might argue that, as of this moment, the prospects of scientific and technical progress and the results of research by the world`s leading lawyers have already necessitated the creation of a new field of law, namely Space Law, which cannot have any analogies with air and maritime law.

At the same time, at the beginning of the second half of the 20th century AD, a list of the main issues and tasks that needed to be addressed during the development of the provisions of Space Law was formed, in particular the following:

– the need to develop space law as a separate branch of law;

– determination of the fundamental principles of space law;

– formation of generally accepted and unified terminology of space law and space activity;

– determination of subjects and objects of space law and space activity, in particular determination of the status of a space vehicle before its launch, after launch and before entering the Earth’s atmosphere and during its stay in outer space;

– specifying the legal status of outer space and celestial bodies;

– identification of outer space and, if possible, delimitation of outer space and the air space of the Earth;

– limiting the upper sector of state sovereignty to the limits of airspace and defining outer space as an object free for research by all states, in particular, the availability of the Earth`s orbital space for all countries;

– use of outer space and celestial bodies for peaceful purposes and in the interests of humanity;

– determination of space jurisdictions, in particular, related to the right of use and ownership concerning outer space and celestial bodies, minerals in space, and the Earth`s orbit (including for placing satellites and space stations);

– establishing the right of space vehicles and satellites to pass through the territory of other countries;

– the need to regulate space traffic, in particular, registration of launches of space vehicles and regulation of their flights in the Earth`s airspace, which is used by air transport;

– the need to establish responsibility for the consequences of space activities and ensure compensation for damage on the ground;

– establishing international mutual assistance in space activities, in particular, assistance in the return of astronauts and space vehicles that have landed outside the territory of their national affiliation;

– the possibility of military use of outer space (in particular, the use of nuclear weapons in space) and the problems of space war;

– problems of space debris;

– regulation of space activity on the Moon and other celestial bodies.

In this way, it is possible to conclude that at the beginning of the second half of the 20th century AD, the process of forming international space law was initiated by setting before the international community a range of basic tasks and issues that required an immediate legal solution.

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