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Chapter 24

Dissemination of Information on K. E. Tsiolkovsky's Scientific Works on Astronautics in the West (Up to the Mid-1930s)^{*}

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Introduction

This chapter is the sequel to earlier works of the author¹ and contains the results of the past three years' studies [circa 2000–2003]. The studies were intended to analyze little-known or unknown-before-now historical sources.

From 1896 to August 1935 Konstantin E. Tsiolkovsky wrote more than 60 papers on space rocketry and astronautics. More than 30 works have been published in the press since 1903 and as brochures since 1914, which the scientist published with his own money (their circulation was about 1,000–2,000 copies). The publication of Tsiolkovsky's scientific articles, on the initiative and with the support of the state, took place for the first time in 1934.²

The first two articles, which were published in 1903 and 1911–1912 in St. Petersburg journals, *Scientific Review (Naučnoe obozrenie)* and *News of Aero-*

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nautics (*Vestnik vozduchoplavaniya*), occupy quite a special place in the history of astronautics.³ Before the year 1913 they had been the first and the only scientific articles containing the theoretical proof of the possibility of liquid-propellant rocket flight into space. The two other articles, “Investigation” (“Issledovanie”), were published in 1914 and 1926 as brochures (the circulation of the first one is not known; the circulation of the second one was 2,000 copies). In 1924 the first article, “Investigation” (“Issledovanie”), was published with some supplements and alterations under the title “Rocket into Space” (*Raketa v kosmicheskoe prostranstvo*) and also as a brochure. The circulation comprised 1,000 copies.

The questions regarding the dissemination of the information about Tsiolkovsky’s scientific articles on astronautics have been raised a number of times since the year 1933.⁴ In the course of the discussion, conclusions were made, which on the whole were supported by the majority of the authors. The conclusions were the following: Tsiolkovsky as a theoretician of astronautics has become familiar to the Western public since the year 1924—moreover, nobody has ever doubted his historical priority in the study of the problem of space-rocket flight and his name has not been passed over in silence; and, it was by no means ignored—however *the details* of his works remained unknown to the Western reader, and so they didn’t have *real* impact on the development of astronautics outside the Soviet Union.

The following tasks have been set so as to supplement these conclusions and to make them more exact: (1) to trace the movement of some of Tsiolkovsky’s articles, (2) to estimate the degree of their availability to a mass reader, and (3) to restore the composition and volume of the information on his scientific articles spreading abroad. To fulfill these tasks, extensive bibliographical and archives research has been made, which enabled this author to significantly broaden the source base of research. At the moment it presents a complex of archives, documents, and publications numbering more than 300 titles; two thirds of the materials are new. The analysis concludes that Tsiolkovsky’s works had different ways and fate in different countries of the world. More people were becoming familiar with his works as society on the whole was showing more interest in conquering space and was realizing the necessity to create crafts for high-speed and high-altitude flight. That’s why it seems expedient to consider the history of the dissemination of the information on Tsiolkovsky’s articles in the three countries—France, the United States, and Germany—that correspond to the records of publication of the first pioneer works on the theory of rocket flight into the upper atmosphere and space: Robert Esnault-Pelterie, *Considération sur les résultats d’un l’allègement indéfini des moteurs* (1913); Robert Goddard, *A*

Method of Reaching Extreme Altitudes (1919); and Hermann Oberth, *Die Rakete zu den Planetenräumen* (1923).

Tsiolkovsky's Works in France

Apparently Esnault-Pelterie was one of the first French who got to know about Tsiolkovsky's works. In Soviet publications one can find different opinions regarding when it really happened. According to one of them, Esnault-Pelterie must have read Tsiolkovsky's article “*Issledovanie*” (“*Investigation*”), which was being published in the journal *News of Aeronautics* (*Vestnik vozduchoplavaniya*) from October 1911 to April 1912, when he was visiting St. Petersburg on the Emperor's All-Russian Aeronautics Club's⁵ invitation (16 February 1912 through 2 March 1912).⁶ The main argument for this point of view lay in the fact that the two events—(1) Esnault-Pelterie's stay in Russia, meeting the Russian public that was experienced and well-read on the problems of the flight, and (2) his making the report for the members of *Société Française de Physique* on 15 November of the same year on the problem of spaceflight, the subject of the report being very similar to that of Tsiolkovsky's article “*Investigation*”—were very close in time. Logic behind these considerations is quite understandable: when staying in Russia Esnault-Pelterie couldn't help getting acquainted with the special Russian press (the leading aviation journal, *News of Aeronautics*, included) and consequently couldn't help reading Tsiolkovsky's article, which aroused his interest in the study of the problem of space-rocket flight. It is noteworthy that Tsiolkovsky himself did not exclude such a possibility. Moreover, he firmly believed that there was a quite obvious connection between his own article “*Investigation*” (1911–1912) and his French counterpart's work.⁷

There also exists the opinion that Esnault-Pelterie made studies of his own, irrespective of the Russian scientist's work.⁸ The researchers supporting this point of view grounded it, in particular, by referring to the fact that Esnault-Pelterie got interested in the problem of space-rocket flight long before his coming to Russia, and there was no need in Tsiolkovsky prompting him. They resorted to the following argument: in St. Petersburg, Esnault-Pelterie delivered a lecture on astronautics.⁹

Thorough study of all the materials of the discussion on a possible cause-effect link between Tsiolkovsky's and Esnault-Pelterie's works, a thorough comparison of their texts included, revealed that neither of the parties has sufficient weighty evidence. There exists no direct evidence that in 1912 Esnault-Pelterie knew about the publication of Tsiolkovsky's article in the *News of Aeronautics* journal. Referring to the report made by Esnault-Pelterie in St. Petersburg as a

proof that Esnault-Pelterie's investigations had been made independently has no solid foundation either. J. I. Perelmann's (who asked those present at the lecture: K. E. Vejgelin and Nikolai A. Rynin) and Willy Ley's (who asked Esnault-Pelterie himself) evidence makes this author state that in his St. Petersburg lecture the French researcher touched only on the problems of aviation.¹⁰

Proceeding from all the convincing facts at our disposal we may conclude that Esnault-Pelterie became familiar with the name and the ideas of Tsiolkovsky not earlier than October 1927 and no later than April 1928. The early date is based on the time of publication of the journal, *Flugsport*, containing the article by A. B. Scherschevsky¹¹ in which the latter gave a detailed rendering of Tsiolkovsky's article and which Esnault-Pelterie himself referred to as a source of his getting familiar with the actual situation on astronautics.¹² The later date relates to Alexander Chizhevsky's and Perelmann's initiatives; they made the first attempts to inform the French scientific public about Tsiolkovsky's works.¹³ What made them do it? In February 1928 Esnault-Pelterie's *L'Exploration par fusées de la très haute atmosphère et la possibilité des voyages interplanétaires* was published. Chizhevsky addressed the *Société Astronomique de France* (French Astronomy Society), sending a letter dated 12 April and several brochures of Tsiolkovsky ("Investigation" 1914 and 1926), "Rocket into Space," and "Space Rocket: Preparation Tests" (*Kosmicheskaja raketa: Opytnaja podgotovka*). Between 24 March 1928 and 28 April 1928 Perelmann also sent to the journal *L'Astronomie* his own article, "Patriarch of Astronautics" ("Patriarch astronavtiki"), with a picture of Tsiolkovsky from 1927 signed by his own hand and an inscription that read: "J'ai 70 ans et je suis né en 1857 ans." He also sent letters from the *Russkoe obščestvo ljubitelej mirovedenija* (Russian Society of Lovers of World Study) there.¹⁴ But it cannot be determined whether all the materials sent by Perelmann were also received by Esnault-Pelterie. As for Chizhevsky's letter and a French translation of Tsiolkovsky's brochures, they were given to him by a member of the Astronautics Committee of the *Société Astronomique de France*, Joseph Béthenod.¹⁵ These brochures were apparently the first Tsiolkovsky works that French pioneers of astronautics could read. It seems that these brochures were considered a claimant on the international prize on astronautics, Esnault-Pelterie Prize—*Prix REP-Hirsch*.¹⁶

His first and last opinion on Tsiolkovsky's works, Esnault-Pelterie expressed on the pages of the historical review, which opens his book *L'Astronautique*. Noting some mistakes in Tsiolkovsky's works, he refused to take them as a proof of Tsiolkovsky's priority in formulating and developing some problems of astronautics.¹⁷

The first (known) article written in the French language, in which Tsiolkovsky was presented to the reader as a founder of cosmonautics and which for the first time was illustrated by his portrait, was published in the newspaper *L'Humanité* and dated 19 August–2 September 1930. It was written by Ary A. Sternfeld under the pen name L. Rolin.¹⁸ It was titled “*Utopie d'hier, possibilité d'aujourd'hui. Peut-on aller de la Terre aux autres planètes?*” (“Today's Utopia—Tomorrow's Reality. Is It Possible to Fly to Other Planets from the Earth?”) In the first half of the 1930s he published more articles that touched on Tsiolkovsky's works.¹⁹ Sternfeld was getting information on Tsiolkovsky directly from the Soviet Union: he was corresponding with the Russian scientist, he read his works, the bibliographical literature (*K. E. Tsiolkovsky: His Life, Works and Rockets* by N. A. Rynin, in particular) in the original.²⁰ Sternfeld had a number of copies of Tsiolkovsky's brochures, which he had received from the author and through “the French branch of the USSR's foreign trade Bank.”²¹ Some of them, together with Rynin's monograph, were given to the National Library in Paris.²² Sternfeld, who never doubted Tsiolkovsky's historical priority in the development of the theoretical fundamentals of space-rocket flight, worried about Esnault-Pelterie's skeptical attitude toward the priority achievements of the Russian scientist.²³ Later he felt upset because he was not able to convince Esnault-Pelterie of the existence of Tsiolkovsky's “Investigation” from the year 1903, saying: “It's [a] pity! He [Esnault-Pelterie] was a very honest man. If he had seen the priority works by Tsiolkovsky with his own eyes he would have told about it.”²⁴

As far as is known, Sternfeld was one of the few correspondents of Tsiolkovsky in France. Besides Sternfeld, Tsiolkovsky exchanged some letters with the *Association internationale biocosmique* (International Biocosmic Association).²⁵ Alexandre Ananoff alleged that he also corresponded with Tsiolkovsky,²⁶ but this fact finds no documentary proof—among Tsiolkovsky's epistolary materials in the scientist's archives, there were no letters from him. Ananoff also told that “at the beginning of 1927, when Oberth was making his famous film *Frau im Mond*, he, a young student, happened to come across books by the Russian prodigious pioneer Tsiolkovsky.”²⁷ Even if it is assumed that Ananoff confused the dates in his memoirs, the film *Frau im Mond* was being made in 1928–1929 (it was first shown on 15 October 1929)—it is difficult to understand what particular brochure by Tsiolkovsky was spoken of and how Ananoff happened “by mere chance” to come across this brochure. From April 1928 through 1935 in France, brochures by Tsiolkovsky could most probably be found in the *Société Astronomique de France* (they were sent there by Chizhevsky); Sternfeld also had some (he got them through the Soviet Foreign Trade office and received

them from Tsiolkovsky); and there were also some brochures in the National Library (it got them from Sternfeld). However, Ananoff most probably had all the reasons for the dedication, which opens his book *L'Astronautique*: “To the memory of my teacher Konstantin Eduardovich Tsiolkovsky, the genius pioneer of cosmonautics.”²⁸ This book became, in 1950, the first one written in the French language that contained detailed renderings of Tsiolkovsky’s ideas on astronautics and where Tsiolkovsky’s priority achievements were pointed out. The main source of information for Ananoff was obviously German-language literature of the second half of the 1920s to the first half of the 1930s and English-language publications by Ley.

Tsiolkovsky’s Works in the United States

The history of dissemination of the information on Tsiolkovsky in the United States until the mid-1930s is even less rich in events than the history of France getting acquainted with this scientist. The article “Investigation” (1911–1912) was mentioned in the bibliography of the Smithsonian Institution published in 1921, and that means it was available to American readers. Some sources witness that the information about Tsiolkovsky could appear in the United States in the Russian-language emigrant press in 1926. One of the Russian scientist’s correspondents in the United States, David D. Burljuk, sent “a short article” to the editorial board of the newspaper *Russian Voice*. In this article he presented Tsiolkovsky to the public as “a true pioneer of interplanetary flights.” It was sort of an answer to the publication of the article “on interplanetary flights,” which narrated about “Goddard, Oberth, even Esnault-Pelterie” but Tsiolkovsky was not mentioned.²⁹ Burljuk promised Tsiolkovsky to inform him about the results of his initiative and expressed the hope that “the newspaper serving Russian interests in the USA” would publish his article. However, there is no evidence preserved in their further correspondence of this initiative being developed. It is also known that in 1929 Tsiolkovsky sent his brochures to some American journals, but the reaction is unknown. The earliest record of Tsiolkovsky in the United States and some brief information about him can be found in the *Bulletin of the American Interplanetary Society* in July 1930.³⁰ The information was given to the *Bulletin* by Willy Ley, who primarily was sending information from Germany to his U.S. colleagues and in spring 1935 immigrated to the United States. No publications by American authors have been found that touched on Tsiolkovsky’s articles. Apart from Ley there was one more English-speaking author who was writing about Tsiolkovsky in that period. It was Philip E. Cleator, in England, who was getting the information to a great degree from

German-language literature (Ley had been the first to read his manuscript, being his first critic), from Perelmann's books (Cleator called him his friend whom he indebted writing the book), and from Rynin. The first works by American authors engaged in disseminating the idea of astronautics in which Tsiolkovsky's ideas were briefly mentioned were the book *Rocket Research—History and Handbook and Jets and Rockets: The Science of Reaction Motor and its Practical Application for Aircraft and Space Travel* by Constantin P. Lent and the article "The Liquid-Propellant Rocket Motor—Past, Present and Future" by James H. Wyld.³¹

It would be interesting to know whether Goddard was familiar with Tsiolkovsky's articles when he started the study of the problems of realizing space-flight. It is a common opinion that it is an unquestionable fact that the American scientist created his book, *A Method of Reaching Extreme Altitudes*, independent of the Russian theoretician of astronautics.³² As for a later period, Goddard might possibly have become acquainted to some degree with Tsiolkovsky's articles, but this author could not find any facts and arguments for or against this supposition.

Tsiolkovsky's Works in Germany

Tsiolkovsky's works were known in Germany better than in any other country. Archives research of the past few years [circa 2000–2003] brought unexpected results. It has become possible to discard the opinion that Tsiolkovsky's article "*Investigation*" (1903) was not available to Russian or foreign readers because the journal *Scientific Review* (volume 5, May 1903), where the article had been published, was seized by the police because of the mysterious death of the journal's editor-in-chief, M. M. Filippov, on 12 March 1903.³³ The facts have been found, proving that the circulation of this issue of the journal got spread across Russia³⁴ and was received by some libraries in Germany. In 1904 V. I. Lenin, living in Vienna, ordered and received several copies of the journal *Scientific Review* for 1903 (volume 5 included) and 1904 through a town library in Aachen, Germany.³⁵ Some copies of the journal *Scientific Review* containing Tsiolkovsky's work "*Investigation*" (1903) have been found in the library of Leipzig University (they were apparently received through subscription on 23 June 1903) and in the library of *Slavisches Institut* of Heidelberg University (presumably it was received immediately after publication and given to *Russische Lesehalle*, the Russian Reading Hall). This collection of books and periodicals was made and had been supported by several generations of Russian students until the year 1914, when it was closed.³⁶ It is but natural that the Heidelberg copy of the journal *Scientific Review* is particularly interesting, because this copy geographically "crossed" paths with one of the university's students, Oberth, who

at this period was working on “the rocket theory.” However, there is no evidence that Oberth was holding this copy in his hands when he was making his own research, and there is no evidence either to make one doubt his words that he got to know about Tsiolkovsky’s articles only after the publication of his own book.

The early stages in the history of the dissemination of information on Tsiolkovsky’s works in Germany can be dated from April 1920 through 1921 and from 1925 through the mid-1930s. The first stage is associated with the popularizing activities of Alexander Scherschevsky, who on 16 April 1920³⁷ delivered the lecture for members of the Berlin group of *Wissenschaftliche Gesellschaft für Luftfahrt*. Though the report contained the review of the development of aviation in Russia before 1914, Scherschevsky paid attention to the problem of space-rocket flight, dwelling on Tsiolkovsky’s works. One of them—the article “*Investigation*” (1911–1912)—was known to him because of its publication in the journal *News of Aeronautics* and also thanks to Perelmann’s report on the possibility of interplanetary travel, which was made on 20 November 1913 in *Russkoe obščestvo ljubitelej mirovedenija* in St. Petersburg and dealt with the works of the Russian theoretician of astronautics.³⁸ Scherschevsky’s report was not published. But it is known from Scherschevsky himself that one of those present at the lecture, Professor Hans Reissner, reacted, saying that he had elucidated similar questions at one of his seminars.³⁹

There is one more event to mention that can be called curious: in October 1921 Scherschevsky published two short several-line reports about Tsiolkovsky’s death in a German journal.⁴⁰ It still remains unknown where Scherschevsky got this information. It is also unknown who told him about his mistake and even gave him Tsiolkovsky’s address in Kaluga. But no doubt it happened between 12 October 1921 and 22 December 1921—Scherschevsky wrote Tsiolkovsky the first letter telling him that numerous “German aviation experts” were interested in his works on “the exploration of the world spaces by reactive apparatus” and asked to send them. Several brochures were sent under the name of Tsiolkovsky to Berlin—“*Outside the Planet Earth*” (*Vne Zemli*) and *Treasures of the Universe* (*Bogatstva Vselennoj*).⁴¹ It’s difficult to say whether they were received by “German experts,” because Scherschevsky stopped corresponding with Tsiolkovsky from 1922 to 1926 for unknown reasons. In December 1923, half a year after Oberth’s book *Die Rakete zu den Planetenräumen* was published, Scherschevsky published his first article on astronautics: “*Put’ k zvezdam. Zabytye stranicy russkoj istorii*” (“Road to Stars: Forgotten Pages of Russian History”), in which he told in detail about Tsiolkovsky’s priority works on cosmonautics. But this article was written in the Russian language in the Soviet emi-

grant newspaper *On the Eve (Nakanune)*, so it seems doubtful that it became known to German readers.⁴²

The beginning of the second stage of dissemination of the information about Tsiolkovsky in Germany dates to April 1925 when *Verlag von R. Oldenbourg* (Publishers' House of R. Oldenbourg) received Tsiolkovsky's brochure "*Rocket into Space*"⁴³ and immediately sent it to Oberth.⁴⁴ So far we have grounded the date of Oberth becoming acquainted with Tsiolkovsky's works (in Oberth's memoirs) written in different years and in which is found a lot of confusion. At the moment it is known for sure that between 16 April 1925 and 24 April 1925 Oberth received from the Publishers' House of Oldenbourg the brochure "*Rocket into Space*," which he read with the help of one of his pupils.⁴⁵ Thus, he became the first German reader of this article by Tsiolkovsky. It is noteworthy that immediately afterward—between 24 April 1925 and 25 May 1925⁴⁶—he sought to begin corresponding with Tsiolkovsky. This fact has not been known before, because in Tsiolkovsky's archives there are only letters from Oberth dated 1929–1930 preserved.⁴⁷

It can be surmised that neither the first letter, written by Oberth with a copy of his book *Die Rakete zu den Planetenräumen* enclosed, nor the second one, sent in 1927,⁴⁸ for some unknown reasons, were received by Tsiolkovsky. At the end of 1926 and the beginning of 1927, Oberth asked, through Valentin Glushko, about new works by Tsiolkovsky and asked "whenever possible to send him his sincere greetings and every success."⁴⁹

Oberth did his best to make Tsiolkovsky's name that of a pioneer of aeronautics: for the first time the name appeared on the pages of Western scientific literature featuring the problem of spaceflight. In July 1925, when informing Walter Hohmann of Oberth's remarks on the text of the manuscript of the book *Die Erreichbarkeit der Himmelskörper*, Oberth shared his own consideration, referring to the brief historical review of earlier attempts at solving the problem of outside-the-atmosphere flight (speaking particularly of Hermann Ganswindt, who "in 1890 set out the idea of the space rocket flying craft when he was doing his public lecturing"), which says as follows: "I think that the Russian Tsiolkovsky in Kaluga already before Ganswindt pointed out that celestial bodies could be reached by means of rocket spacecrafts."⁵⁰ Hohmann took into consideration Oberth's comments and remarked in the published text that "the Russian Tsiolkovsky at the same time also" was developing the idea of the space rocket flight.⁵¹

The peculiar feature of the second stage of the history of dissemination of information about Tsiolkovsky in Germany is Tsiolkovsky's personal contacts

with German spaceflight pioneers and advocates and all of them becoming acquainted in detail with the works of the Russian scientist.

To restore the whole volume of Tsiolkovsky's correspondence with his German correspondents, we for the first time made the attempt to reconstruct the collection of letters received by Tsiolkovsky from Germany and sent as replies. The ground for the restoration was made first of all by the epistolary materials preserved in Tsiolkovsky's private archives, the publications of letters undertaken by him, his notes and marks, and also the supposition that as a rule the scientist didn't leave letters unanswered. It has been found that in 1921 and from 1926 through 1934 Tsiolkovsky received from Germany about 60 letters (49 of which are preserved), he sent about 50 letters in response (of which only 9 as drafts are preserved in his archives and 1 letter sent to the Publishers' House of R. Oldenbourg). German correspondents displayed great interest in Tsiolkovsky's works. In many letters they asked to send to Germany his published articles. Tsiolkovsky was happy to do it. Today we able to restore quite fully the composition and volume of Tsiolkovsky's articles spread in Germany: from 1922 to 1934 the scientist sent more than 80 copies of his works (34 titles) to 18 addressees. Among them there were "*Rocket into Space*," "*Investigation of World Spaces by Reactive Apparatus*" (1914, 1926); "*Space Rocket: Preparation Tests*," "*Aims of Astronautics*" (*Celi zvezdoplavaniya*); "*Space Rocket Trains*" (*Kosmicheskie raketye poezda*); "*To Astronauts*" (*Zvezdoplavateljam*); "*Gas Compressor and Its Calculation*" (*Sžimatel' gazov i ego rasčet*); "*Jet Plane*" (*Reaktivnyj aeroplan*); "*Outside the Planet Earth*" (*Vne Zemli*); "*New Aeroplane*" (*Novyj aeroplan*); "*Pressure of Air on the Plane on Its Normal Movement in the Air*" (*Davlenie vozducha na ploskost' pri ee normal'nom dvizhenii v vozduche*); and "*Air Resistance and Express Train*" (*Soprotivlenie vozducha i skoryj poezd*). In fact all Tsiolkovsky's brochures on astronautics and aviation, published beginning in 1920, were sent to Germany. Among those who received them were W. Brügel, M. Valier, W. Hohmann, R. Lademann, W. Ley, H. Oberth, A. B. Schershevsky, the editorial boards of the journals *Verein Deutscher Ingeneure* and *Die Rakete*, the library of Prussian Academy of Sciences (*Preußische Akademie der Wissenschaften*), the Observatory of Berlin-Treptow (*Archenhold Sternwarte Berlin-Treptow*), and several bookshops.

None of Tsiolkovsky's articles was published in the German language during his lifetime, though in 1926–1927 Schershevsky and Lademann appealed to the Publishers' House of R. Oldenbourg with the suggestion of publishing Tsiolkovsky's works "*Rocket into Space*" and "*Investigation*" (1926). Oldenbourg grounded the refusal, saying, in particular, that from the view point of the article's content there was nothing new in it as compared with the similar studies of

the German authors.⁵² The complete absence of Tsiolkovsky's German-language texts did not become an obstacle, and detailed information on the content of his articles was rapidly disseminating in Germany. In the course of our bibliographical research, about 50 German publications (dated 1925–1935) have been found, in which Tsiolkovsky is mentioned and his ideas are rendered and discussed. Hohmann, Valier, Scherschevsky, Lademann, Lorenz, H. Grimm, Ley, R. Nebel, and Brügel wrote about Tsiolkovsky. Valier was popularizing Tsiolkovsky's works during his public lecturing. It is a well-known fact, in particular, that on 29 April, when making a report in the *German Aviation Society*, Valier "dwelt especially long on Tsiolkovsky's works."⁵³

Besides, German translations of the articles "*Rocket into Space*" and "*Investigation*" (1926) made by Scherschevsky⁵⁴ in manuscripts were available to the interested reader. It is known that W. Hoff (Chair of the German Aviation Society), R. von Mieses (Director of the Institute of Applied Mathematics and Mechanics of Berlin University, Institut für angewandte Mathematik und Mechanik), G. Hamel (Professor of Mechanics in Higher Technical School in Berlin-Charlottenbourg Technische Hochschule Berlin-Charlottenburg), and such world-known scientists as Ludwig Prandtl and Albert Einstein read his works.⁵⁵

There is still one more possible source of information about Tsiolkovsky's works that should be mentioned: the books by the Soviet popularizers of astrodynamics, Perelmann and Rynin. Thus, on 26 April 1929 Perelmann sent Hohmann his book together with the German translation of the foreword written by Tsiolkovsky.⁵⁶ The most significant role in the dissemination of the information about Tsiolkovsky in Germany was undoubtedly played by Scherschevsky and Lademann.

Alongside the general estimation of the creative personality of Tsiolkovsky on the whole, his priority achievements in particular, numerous publications contained a detailed rendering of his ideas. German readers were acquainted with the following results of Tsiolkovsky's studies:

- the proposal of using liquid propellants in the engine of the space rocket flying craft;⁵⁷ in particular, oxygen and hydrocarbons included, hydrogen and one-atom hydrogen;⁵⁸
- space rocket design, which had the combustion chamber with the nozzle surrounded by huge propellant tanks; the propellants being carried into the combustion chamber by pumps; cooling the combustion chamber by passing one of the liquids through a double-wall jacket; electric ignition of propellant mixture; gyroscopes; automatic control systems;⁵⁹
- the idea of preliminary first-stage acceleration;⁶⁰
- the idea of aerodynamic braking in the atmosphere;⁶¹

- the idea of space stations;⁶²
- the suggestion of using antigravitational protecting means—liquid baths,⁶³
- the experiments on the study of the effects of overloads on a living organism;⁶⁴
- the description of spaceflight conditions;
- the study of the feasibility of creating jet planes,⁶⁵
- the discussion of the prospects and practical use of conquering space.⁶⁶

Tsiolkovsky's proposals on organizing experiments in the field of rocketry, his calculations of parameters of rocket liquid-propellant engines were especially thoroughly considered and discussed.⁶⁷

The German researchers discussed Tsiolkovsky's works' content rather critically. Thus they criticized Tsiolkovsky for

- insufficiently detailed consideration of the whole complex of problems of spaceflight⁶⁸ and of the question of the rocket technical design, in particular;⁶⁹
- his proposal of using iron as a construction material of the space rocket;⁷⁰
- overestimated value of exhaust velocity;⁷¹
- the idea of "curved exhaust nozzle";⁷²
- imperfect mathematical calculations and practices and ignoring "methods of modern aerodynamics."⁷³

Not all critical remarks made by the German authors were just. In particular, Lademann made a mistake saying that the idea of gas rudders was groundless.⁷⁴ Tsiolkovsky put forward this idea for the first time in 1911.⁷⁵ This author cannot possibly agree with Lademann's opinion about Tsiolkovsky's "*Investigation*" (1926). In particular, Lademann wrote that the problems set out in it had not been quite fully and precisely worked out from the point of view of mathematics, that from the point of view of technology it contained no new information and from the point of view of theory it was weaker than similar works by Goddard, Oberth, and Hohmann.⁷⁶ It is noteworthy that Valier expressed quite the opposite opinion on the same article by Tsiolkovsky. He called it "a new work" and was sorry that German translation of this article had not been published.⁷⁷

Oberth more than once spoke about the necessity to publish Tsiolkovsky's works in German. He considered Tsiolkovsky's manner of "expressing his thoughts to be clear and fascinating." As an example, he referred to his pupil who had translated for him Tsiolkovsky's article "*Rocket into Space*": "This boy learning at high-school can be called neither a good mathematician nor a good physicist, but he read the book with great interest and understood most of the equations and formulae without my explanation."⁷⁸ The conclusion that Oberth made in 1926 was as follows: Although "Tsiolkovsky says nothing new as com-

pared with what Goddard, Hohmann, and I have already told,” his book *Rocket into Space* “with all its commentaries in which mistakes and possibilities of their correction are pointed out can serve the introduction to cosmonautics.”⁷⁹

In July 1929 Oberth confirmed his opinion that it was expedient and advisable to publish German translations of Tsiolkovsky’s works and even said that he was prepared to be a go-between (negotiator) in the talks with the publisher’s house: “I think that the best works which haven’t as yet been published in the German language are the works by Goddard . . . and Esnault-Pelterie. . . . The works by Tsiolkovsky, Rynin, and Perelmann are also good. Herr Scherschevsky has partly translated them, and he will partly translate more in case he finds a publisher. If You don’t feel like negotiating with Scherschevsky directly, I am prepared to act as a go-between.”⁸⁰ In 1933 Oberth once again stressed the present-day importance of Tsiolkovsky’s works: “And the both two masters of cosmonautics, Ganswindt and Tsiolkovsky, deserve their works to be studied.”⁸¹ In the late 1920s–early 1930s Oberth’s attitude toward Tsiolkovsky’s articles was as scientific works that by no means should be passed over to the archives. This is the best evidence that they were part and parcel of the social practice of German pioneers and advocates of astronautics. It would be naïve to say that Tsiolkovsky consulted and advised his German counterparts on their writing books and articles or conducting experiments on rocketry as some authors state.⁸² However, one can’t help noticing that the information on Tsiolkovsky’s articles easily and naturally integrated with the creative thought of the German researchers, enriching and enhancing the power of their thought. And here Tsiolkovsky’s ideas were either used as a supplementary argument in favor of the conclusion of the technical possibility of spaceflight or served as a competing motivation of the necessity to develop practical works on rocketry. In particular, sometimes Oberth used to compare results of his calculations with the ones made by Tsiolkovsky. Evidence of this fact is in Oberth’s letter to F. von Hoeft, which says: “Tsiolkovsky seems to have calculated exhaust velocities to be more than 4,000 meters per second. Unfortunately, neither he, nor Scherschevsky have answered my letters dealing with the problem. If I were sure that the data are true I would publish my theory” (in the book *Wege zur Raumschiffahrt*).⁸³ This author cannot help agreeing with the statement that the book *Wege zur Raumschiffahrt* was written by Oberth without an initiating impact of Tsiolkovsky’s works.⁸⁴ But it would also be unjust to say that Oberth’s mentioning Tsiolkovsky’s ideas in his book was a matter of mere courtesy.

In November 1927 Oberth got involved in debates on the technical possibility of creating space rockets (they have entered history as “the Battle of the Formulae”).⁸⁵ In this “battle” he made use of his own conclusions, and also the

results of Tsiolkovsky's studies. Oberth was arguing with Lorenz, who thought that with known exhaust velocities it was possible to expect mass ratio only from 34 to 582 and that a vertical take-off of the rocket would add more problems that might be insurmountable (overcoming air resistance would require too much propellant). Oberth discussed the possibility of inclined take-off, referring to Tsiolkovsky.⁸⁶ Oberth did not leave unnoticed the direct argument between Lorenz and Tsiolkovsky emphasizing the fact that the German opponent gave a wrong erroneous interpretation of Tsiolkovsky's calculations, and that was why he arrived at the wrong conclusion about the impossibility of creating space-rocket means of transport.

Raketenflugtechnik, written by Eugen Sänger, can prove to be a good example of a fruitful and creative use of the results of Tsiolkovsky's studies. Analyzing the reasons affecting the coefficient of efficiency of the rocket engine, he made use of the calculations made by Goddard and Oberth, and also by Tsiolkovsky. When defining the aerodynamic shape of the jet plane hull and wings, Sänger also took into account corresponding considerations of Tsiolkovsky.⁸⁸

The information about Tsiolkovsky's works that spread in Germany in 1926–1927 can be considered as a factor inducing German rocket engineers to take more decisive steps to begin practical works. The press reported that Tsiolkovsky had received 400,000 rubles from the Soviet government for experiments in which he had made such great progress that he began the study of the aerodynamic shape of a supersonic plane's wings, and, in Moscow, rockets for 11 persons were being built,⁸⁹ which, of course, was not true. But, certainly, these reports could not leave German researchers calm and indifferent to the progress and experience of their foreign counterparts. Valier's concern, which he shared with Oberth, can be considered as evidence for this statement:

Tsiolkovsky and his disciples have made such progress in their study of the details that they are already occupied with the search of the optimum shape of the wing for flying at super-sonic velocities. I start feeling bad about it. If Tsiolkovsky really got 400.000 roubles (from the government?), it will be difficult for us to catch up with him. And it also looks as if he is working on both directions: as a rival in realizing my plan (from the airplane to the spacecraft) and also Your plan (from the high-altitude rocket to the Moon rocket). As for Goddard's works, on the contrary, we hear nothing from him.⁹⁰

The information about the practical initiatives of Tsiolkovsky spurred German enthusiasts to more energetic actions. One more piece of evidence was J. Winkler's reaction to the news about the above-mentioned amount of money supposedly given to Tsiolkovsky. Not giving Tsiolkovsky's name, Winkler repeated the information about 400,000 rubles given by the Soviet government for experiments on rocketry and accentuated the fact that unlike the Soviet Union

and the United States, the government of Germany did not support the development of rocketry.⁹¹ Winkler also reprinted the following information in his journal (not thinking much about whether it was truth or a lie): “To the 35th anniversary of Tsiolkovsky’s scientific activity at the end of August 1927 the USSR intended to launch a manned rocket.”⁹² The idea behind it was most probably to call, to appeal to patriotic feelings of, his fellow colleagues able to finance similar works in Germany. And it was not mere chance that at the end of his article he suggested increasing the dues in *Verein für Raumschiffahrt* and to give loans for conducting experiments. In unison with Valier and Winkler in this context, von Hoeft addressed critics of the space-rocket flight idea, asking them at least not to put a spoke in the wheels: “. . . While America supports its Goddard and Russia—its Tsiolkovsky, it is only in Germany that we see malicious attacks on adherents of cosmonautics.”⁹³

Conclusion

When, in the mid-1920s, advocates of spaceflight started spreading the idea of spaceflight more enthusiastically, Tsiolkovsky’s articles became no less popular with them than articles on the same subject written by his Western counterparts. In Germany many people got familiar with them because their detailed content was carefully rendered by Scherschevsky and Lademann, and they were easy to understand by the broad-reading public. The analysis of the information published about Tsiolkovsky in Germany in 1926–1929 enables the reader to assert that his articles, to a great extent, motivated the enthusiasm of German rocket pioneers, inducing them to take decisive energetic steps aimed at establishing and strengthening the Space Society (*Verein für Raumschiffahrt*) and developing experiments with rockets. Besides, conclusions made from Tsiolkovsky’s articles were often used by adherents of cosmonautics as arguments in their disputes with their critics (opponents) who were trying to prove that space-rocket flight was technologically unfulfilled (could not be realized in practice). In these two functions (motivation and argumentation), Tsiolkovsky’s articles were an inseparable, indispensable component of the information flow in which the development of the idea of the rocket flying vehicle as a means of super-high and super long-distance flight (spaceflights included) was going on in Germany.

Notes*

- ¹ T. N. Jelnina, K. E. Ziolkowski i pionery kosmonavtiki Germanii, 1994; T. N. Jelnina, K istorii izdanija i rasprostraneniya stat'i K. E. Ziolkowskogo "Issledovanie mirovych prostranstv reaktivnymi priborami" (1903), 1997; T. N. Jelnina, Tvorčeskaja istorija naučnogo truda K. E. Ziolkowskogo "Issledovanie mirovych prostranstv reaktivnymi priborami" v literaturе i istočnikach, 2002.
- ² K. E. Tsiolkovsky, Isbrannye trudy K. E. Ziolkowskogo. Cel'nometalličeskij dirižabl'. Kniga 1-ja; Reaktivnoe dviženie. Kniga 2-ja, 1934.
- ³ Further "Issledovanie."
- ⁴ A. A. Rodnych, Rakety i raketnye korabli, 1933, pp. 29–32; B. N. Vorob'iov, Vstreči s Ziolkowskim, 1951; M. S. Arlazorov, Ziolkowski, 1962; A. A. Kosmodem'janskij, K. E. Ziolkowski (1857–1935), 1976; N. G. Belova, E. K. Straut, Mirovoe prisnanie, 1970; V. P. Gluschko, Vstupitel'noe slovo, 1974, p. 4; A. A. Sternfeld, Vvedenie v kosmonavtiku, 1974, p. 55; F. H. Winter, Birth of the VfR: The Start of Modern Astronautics, August 1977; D. B. Hermann, K.E. Ciolkowsky im Spiegel westeuropäischer Raumfahrtliteratur, 1981; G. S. Vetrov, Robert Esnault-Pelterie, 1982; F. H. Winter, Prelude to the Space Age, 1983; N. G. Belova, E. M. Radskaja, Rasprostranenie i ocenka trudov K. E. Ziolkowskogo po kosmonavtike za rubežom, 1989; F. H. Winter, Rockets into Space, 1990; H. Barth, Hermann Oberth. "Vater der Raumfahrt," 1991; F. H. Winter, Was Hermann Oberth the True Father of Spaceflight? 1996.
- ⁵ A. A. Kosmodem'janskij, Predislovie, in R. Esnault-Pelterie, Kosmičeskie poljoty, 1950; B. N. Vorob'ev, Vstreči s Ziolkowskim, 1951, p. 32; B. N. Vorob'ev, Raboty K. E. Ziolkowskogo po mežplanetnym soobščenijam, 1958, p. 15; B. N. Vorob'ev, Vstreči s Konstantinom Eduardovičem, 1971, pp. 31–32; M. S. Arlazorov, Ziolkowski, 1962, pp. 175–176; M. K. Tichonravov, K 60-letiju s načala publikacii 2-oj časti klassičeskogo truda K. E. Ziolkowskogo "Issledovanie mirovych prostranstv reaktivnymi priborami" (1911), 1971, p. 94.
- ⁶ R. Esnault-Pelterie, L'Astronautique (1930): p. 20.
- ⁷ K. E. Tsiolkovsky, Predislovie, in: J. I. Perel'mann, Mežplanetnye putešestviya, 1929.
- ⁸ V. P. Glushko, Vstupitel'noe slovo, 1974, p. 4; A. Sternfeld, Vvedenie v kosmonavtiku, 1974, p. 54; G. S. Vetrov, Robert Esnault-Pelterie, 1982, pp. 88–90.
- ⁹ G. S. Vetrov, Robert Esnault-Pelterie, 1982, pp. 88–91, 150–151.
- ¹⁰ A. A. Sternfeld, Vvedenie v kosmonavtiku, 1974, p. 54.
- ¹¹ A. B. Scherschevsky, Das Raumschiff 20 (1927): p. 387.
- ¹² R. Esnault-Pelterie, Doklad generalu Ferrie, 1928.
- ¹³ J. I. Perelmann to K. E. Tsiolkowski, 24 March 1928; A. L. Chizhevskij an K.E. Tsiolkowski, 21 March 1928.
- ¹⁴ J. I. Perelmann to K. E. Tsiolkowski, 20 March 1928, 24 March 1928, 28 April 1928.
- ¹⁵ R. Esnault-Pelterie, L'Astronautique (1930): p. 20.

* **Publisher's Note:** Reference notes 1–93 are not always complete detailed citations. For more complete information see the "Books and Articles" and "Letters" sections following this section.

- ¹⁶ A. Hirsch to H. Oberth, 7 June 1929.
- ¹⁷ R. Esnault-Pelterie, *L'Astronautique* (1930): p. 22.
- ¹⁸ L. Rolin, *Utopie d'hier, possibilité d'aujourd'hui. Peut-on aller de la Terre aux autres planètes?* 19 August–2 September 1930; A. A. Sternfeld, *Vvedenie v kosmonavtiku*, 1974, p. 220.
- ¹⁹ A. Sternfeld, *Les problèmes de la cosmonautique*, 1934; A. Sternfeld, *Quand les poètes montent au ciel*, 1934; A. Sternfeld, *Ironons-nous dans la Lune*, 1934; A. Sternfeld, *Les précurseurs et les théoriciens de la cosmonautique*, 1935.
- ²⁰ N. A. Rynin, *Mežplanetnye soobščenija*. Bd. 7, Tsiolkovsky, ego žizn', raboty i rakety, 1931.
- ²¹ A. Sternfeld, *Govorjat dokumenty* (1930–1935), 1971, p. 65.
- ²² A. Sternfeld, *Govorjat dokumenty* (1930–1935), 1971, p. 65. A. A. Sternfeld, *Vvedenie v kosmonavtiku*, 1974, p. 234.
- ²³ A. Sternfeld to K. E. Tsiolkowsky, 12 September 1930.
- ²⁴ A. Sternfeld, *Govorjat dokumenty* (1930–1935), 1971, p. 70.
- ²⁵ Association international biocosmique to K. E. Tsiolkowsky, 24 October 1929; April 1934.
- ²⁶ A. Ananoff, *L'Astronautique* (1950): pp. 10–11.
- ²⁷ A. Ananoff, *L'Astronautique* (1950): pp. 10–11.
- ²⁸ A. Ananoff, *L'Astronautique*, 1950.
- ²⁹ D. D. Burljuk to K. E. Tsiolkowsky, 18 February 1926.
- ³⁰ W. Ley, *News from Abroad*, July 1930; Max Valier: *Rocket Martyr*, August 1930; W. Ley, *The reader Speaks: From the German Interplanetary Society*, September 1930; W. Ley, *On Rockets and Their History*, in *Astronautics* (August–September 1932), October 1932; W. Ley, *Rocketry in Germany*, April 1934; W. Ley, *Rockets: Ancient Art and Modern Science*, November 1935; W. Ley, *Some Practical Aspects of Rocketeering*, November 1936; W. Ley, *The Dawn of the Conquest of Space*, March 1937.
- ³¹ P. E. Cleator, *Rockets through Space: The Dawn of Interplanetary Travel*, 1936. C. G. Philp, *Stratosphere and Rocket Flight* (*Astronautics*), 1937; Constantin P. Lent, *Rocket Research—History and Handbook*, 11 July 1944, p. 97; Constantin P. Lent, *Rocketry: Jets and Rockets: The Science of the Reaction Motor and Its Practical Application for Aircraft and Space Travel*, 1947, p. 29; James H. Wyld: *The Liquid-Propellant Rocket Motor—Past, Present, and Future*, 1946 or 1947, p. 3.
- ³² A. A. Rodnych, *Rakety i raketnye korabli*, 1933, p. 42. V. P. Gluschko, *Vstupitel'noe slovo*, 1974, p. 4; A. A. Sternfeld, *Vvedenie v kosmonavtiku*, 1974, p. 55; F. H. Winter, *Birth of the VfR: The Start of Modern Astronautics*, August 1977, p. 244; D. B. Hermann, K. E. Ciolkowsky im Spiegel westeuropäischer Raumfahrtliteratur, 1981; G. S. Vetrov, Robert Esnault-Pelterie, 1982; F. H. Winter, *Prelude to the Space Age*, 1983, pp. 22–23; N. G. Belova and E. M. Radskaja, *Rasprostranenie i ocenka trudov K. E. Ziolkowskogo po kosmonavtike za rubežom*, 1989, p. 104; F. H. Winter, *Rockets into Space*, 1990, pp. 12–13; 1991; F. H. Winter, *Was Hermann Oberth the True Father of Spaceflight?* 1996, p. 40.
- ³³ B. N. Vorob'ev, *Raboty K. E. Ziolkowskogo po mežplanetnym soobščenijam*, 1958, p. 14; V. V. Bučarskij, *Svetjolka vo Vselennoj*, 1998, p. 73.
- ³⁴ F. A. Zander, *Materialy k knige "Poljoty na drugie planety i na Lunu,"* 1925/1967, p. 56; Gluschko to Ziolkowski, 26 September 1923; N. A. Rynin, Professor Nikolai Aleksejewitsch Rynin *Selbstbiographie*, in W. Brügel, hrsg., *Männer der Rakete*, p. 80.

- ³⁵ A. Erochin, Trud K. E. Ziolkowskogo v fonde V.I. Lenina, 1971.
- ³⁶ R. Steffler, Die Verbreitung der Raumfahrtidee in Deutschland Anfang der zwanziger Jahre, 2000; Verbindungen der Raumfahrtioniere mit führenden Wissenschaftlern bzw. Vereinigungen 1900–1930, 2003.
- ³⁷ Scherschevsky himself dated his lecture 14 March 1920: A. B. Scherschevsky, Die Rakete für Fahrt und Flug. Eine allgemeinverständliche Einführung in das Raketenproblem, 1929, pp. 80–81. The research of R. Steffler made it possible to correct this date: R. Steffler, Die Verbreitung der Raumfahrtidee in Deutschland Anfang der zwanziger Jahre, 2000, p. 35; R. Steffler, Verbindungen der Raumfahrtioniere mit führenden Wissenschaftlern bzw. Vereinigungen 1900–1930, 2003, p. 40.
- ³⁸ J. I. Perelmann, Mežplanetnye putešestviya, 22 November 1913; J. I. Perelmann, Vozmožny li mežplanetnye putešestviya, 1 December 1913.
- ³⁹ A. B. Scherschevsky, Die Rakete für Fahrt und Flug. Eine allgemeinverständliche Einführung in das Raketenproblem, 1929, p. 80.
- ⁴⁰ A. B. Scherschevsky, Internationale Umschau. Sowjet-Russland. K. Ziolkowski, 17 August 1921; A. B. Scherschevsky, K. E. Ziolkowski. Ingenieur, 12 October 1921: R. Steffler, Verbindungen der Raumfahrtioniere mit führenden Wissenschaftlern bzw. Vereinigungen 1900–1930, 2003, p. 45.
- ⁴¹ K. E. Tsiolkovsky to F. A. Tsander, 23 May 1924.
- ⁴² A. B. Scherschevsky, Put' k zvezdam. Zabytye stranicy russkoj istorii, 29 December 1923.
- ⁴³ Verlag von R. Oldenbourg to H. Oberth, 16 April 1925.
- ⁴⁴ Verlag von R. Oldenbourg to H. Oberth, 16 April 1925.
- ⁴⁵ H. Oberth to Verlag von R. Oldenbourg, 24 April 1925; H. Oberth to Verlag von R. Oldenbourg, 10 November 1926.
- ⁴⁶ H. Oberth to Verlag von R. Oldenbourg, 25 May 1925; H. Oberth to Verlag von R. Oldenbourg, 14 July 1925.
- ⁴⁷ H. Oberth to K. E. Tsiolkovsky, 18 September 1929, 24 October 1929, 7 November 1930.
- ⁴⁸ H. Oberth to F. von Hoefft, 5 March 1927.
- ⁴⁹ V. P. Gluschko to K. E. Ziolkowski, 22 January 1927.
- ⁵⁰ H. Oberth to W. Hohmann, 7 July 1925.
- ⁵¹ W. Hohmann, Die Erreichbarkeit der Himmelskörper, 1925, p. 13.
- ⁵² Verlag von R. Oldenbourg to R. Lademann, 12 December 1927.
- ⁵³ A. B. Scherschevsky to K. E. Ziolkowski, before 3 May 1927.
- ⁵⁴ A. B. Scherschevsky, Die Rakete in den kosmischen Raum. Ausser der Erde. Beides von K. E. Ziolkowski, 1926.
- ⁵⁵ A. B. Scherschevsky to K. E. Ziolkowski, 21 December 1927.
- ⁵⁶ F. von Hoefft to J. I. Perelmann, 3 July 1929.

- ⁵⁷ W. Ley, Die Fahrt ins Weltall. Der Werdegang des Raumschiffes. Probekapitel, 15 April 1929; A. B. Scherschevsky, Die Rakete in den kosmischen Raum. Ausser der Erde, Beides von K.E. Ziolkowski, 1926; R. Lademann, Zum Raketenproblem, 1927; R. Lademann, Arbeitsplan für erste wirkliche Vorversuche mit Rückstossraumschiffen von K. E. Ziolkowski, 1927; M. Valier, Raketenfahrt, 1928, p. 173; R. Lademann, Bücherbesprechungen: Die Möglichkeit der Weltraumfahrt. Hrsg. von W. Ley, 1929.
- ⁵⁸ A. B. Scherschevsky, Die Rakete für Fahrt und Flug. Eine allgemeinverständliche Einführung in das Raketenproblem. Berlin-Scharlottenburg, 1929, pp. 105, 107; A. B. Scherschevsky, Die Rakete in den kosmischen Raum. Ausser der Erde, Beides von K. E. Ziolkowski, 1926; R. Lademann, Zum Raketenproblem, 1927; A. B. Scherschevsky, Das Raumschiff, 1927; M. Valier, Raketenfahrt, 1928, pp. 172–173; W. Ley, Die Fahrt ins Weltall. Der Werdegang des Raumschiffes. Probekapitel, 15 April 1929.
- ⁵⁹ R. Lademann, Zum Raketenproblem, 1927; R. Lademann, Bücherbesprechungen: Die Möglichkeit der Weltraumfahrt. Hrsg. von W. Ley, 1929; H. Oberth, Wege zur Raumschiffahrt, 1929, p. 222; R. Lademann, Ziele der Raumschiffahrt. Von K. E. Ziolkowski, 1931.
- ⁶⁰ A. B. Scherschevsky, Das Problem der Reaktionsraumschiffe und der Reaktionsflugzeuge (nach K. E. Ziolkowski), 1927; A. B. Scherschevsky, Das Raumschiff, No. 20 (1927): p. 39; H. Oberth, Wege zur Raumschiffahrt, 1929, p. 222.
- ⁶¹ A. B. Scherschevsky, Das Problem der Reaktionsraumschiffe, 1927; A. B. Scherschevsky, Das Raumschiff, p. 39; H. Oberth, Wege zur Raumschiffahrt, p. 222.
- ⁶² R. Lademann, Zum Raketenproblem, 1927; R. Lademann, Bücherbesprechungen, 1929; H. Oberth, Wege zur Raumschiffahrt, 1929, p. 222; R. Lademann, Ziele der Raumschiffahrt, 1931.
- ⁶³ A. B. Scherschevsky, Die Rakete für Fahrt und Flug, p. 122; R. Lademann, Zum Raketenproblem, 1927; A. B. Scherschevsky, Das Raumschiff, 1927, p. 395; H. Oberth, Wege zur Raumschiffahrt, 1929, p. 108.
- ⁶⁴ A. B. Scherschevsky, Die Rakete für Fahrt und Flug, Eine allgemeinverständliche Einführung in das Raketenproblem, 1929, p. 28.
- ⁶⁵ A. B. Scherschevsky, Moskauer Vortrag von K. E. Ziolkowski, 1928. A. B. Scherschevsky, Buchbesprechung. Prof. K. E. Ziolkowski. Luftwiderstand und Schnellbahnen, 1928; M. Valier, Raketenfahrt, 1928, p. 172; R. Lademann, Das neue Flugzeug. Von K. E. Ziolkowski, 1931. Heft; A. B. Scherschevsky, Die Rakete für Fahrt und Flug, Eine allgemeinverständliche Einführung in das Raketenproblem, 1929, p. 64.
- ⁶⁶ A. B. Scherschevsky, Die Rakete in den kosmischen Raum. Ausser der Erde, Beides von K. E. Ziolkowski, 1926; R. Lademann, Ziele der Raumschiffahrt. Von K. E. Ziolkowski, 1931.
- ⁶⁷ A. B. Scherschevsky, Das Raumschiff, 1927; R. Lademann, Arbeitsplan für erste wirkliche Vorversuche mit Rückstossraumschiffen von K. E. Ziolkowski, 1927; R. Lademann, Den Sternfahrern. Von K. E. Ziolkowski, 1930.
- ⁶⁸ H. Oberth to Verlag von R. Oldenbourg, 25 May 1925, p. 1.
- ⁶⁹ A. B. Scherschevsky, Die Rakete für Fahrt und Flug, Eine allgemeinverständliche Einführung in das Raketenproblem, 1929, p. 122.
- ⁷⁰ H. Oberth to Verlag von R. Oldenbourg, 10 November 1926, p. 1.
- ⁷¹ H. Oberth to Verlag von R. Oldenbourg, 10 November 1926, p. 1.

- ⁷² A. B. Scherschevsky, Die Rakete in den kosmischen Raum, Ausser der Erde, Beides von K. E. Ziolkowski, 1926; R. Lademann, Zum Raketenproblem. 1927.
- ⁷³ R. Lademann, Zum Raketenproblem. 1927.
- ⁷⁴ R. Lademann, Zum Raketenproblem. 1927.
- ⁷⁵ K. E. Tsiolkovsky, Issledovanie mirovych prostranstv reaktivnymi priborami, in Vestnik vozduchoplavaniya (1911): number 19—pp. 16–21; 20—pp. 29–32; 21–22—pp. 31–37; (1912): number 2—pp. 2–7; 3—pp. 15–16; 5—pp. 2–5; 6–7—pp. 6–9; 9—pp. 7–11.
- ⁷⁶ R. Lademann, Zum Raketenproblem, 1927.
- ⁷⁷ M. Valier, Raketenfahrt, 1930.
- ⁷⁸ H. Oberth to Verlag von R. Oldenbourg, 10 November 1926, p. 1.
- ⁷⁹ H. Oberth to Verlag von R. Oldenbourg, 10 November 1926, p. 1.
- ⁸⁰ H. Oberth to Verlag von R. Oldenbourg, 7 July 1929, p. 1.
- ⁸¹ H. Oberth to O. Wiemer, 21 February 1933.
- ⁸² A. P. Romanov, Ivany zabyvšie Ziolkovskogo, 1992.
- ⁸³ H. Oberth to F. von Hoefft, 5 March 1927.
- ⁸⁴ D. B. Hermann, K. E. Ciolkowsky im Spiegel westeuropäischer Raumfahrtliteratur: ein Beitrag zur Wirkungsgeschichte der Ideen von Ciolkowsky, 1981, p. 10.
- ⁸⁵ W. Ley, Vorstoss ins Weltall. Rakete und Raumschiffahrt, 1949, p. 130.
- ⁸⁶ H. Oberth, Ist die Weltraumfahrt möglich? 15 November 1927, p. 146.
- ⁸⁷ H. Oberth, Ist die Weltraumfahrt möglich? p. 164.
- ⁸⁸ E. Sänger, Raketenflugtechnik, 1933, pp. 39, 41.
- ⁸⁹ A. B. Scherschevsky to K. E. Tsiolkovsky, 23 November 1926.
- ⁹⁰ M. Valier to H. Oberth, 30 January 1927, pp. 164, 165.
- ⁹¹ J. Winkler, Der gegenwärtige Stand des Raumfahrtgedankens in Deutschland, 15 April 1927, p. 34.
- ⁹² J. Winkler, Der erste Aufstieg noch, 15 August 1927, p. 112.
- ⁹³ F. von Hoeft, Die Möglichkeit der Weltraumfahrt, p. 282.

Abbreviations Used in the Following Reference Sections

ARAN	russ.: Archiv Rossijskoj Akademii nauk
ARAN/S-PO	russ.: Archiv Rossijskoj Akademii nauk Sankt-Peterburgskoe otделение
BWA	Bayerisches Wirtschaftsarchiv der IHK München
f., op., d., l.	russ.: Fond, opis', delo, listy
GMIK	russ.: Gosudarstvennyj musej istorii kosmonavtiki
HORM/A	Hermann-Oberth-Raumfahrt-Museum, Archiv, Feucht

WGL	Wissenschaftliche Gesellschaft für Luftfahrt
ZAMM	Zeitschrift für angewandte Mathematik und Mechanik
ZFM	Zeitschrift für Flugtechnik und Motorluftschiffahrt. Fachblatt und Lehrbuch der Wissenschaftlichen Gesellschaft für Luftfahrt e.V. Berlin (WGL). Mit Berichten der Deutschen Versuchsanstalt für Luftfahrt e.V., Berlin-Adlershof (DVL), sowie Beiträgen der Aerodynamischen Versuchsanstalt zu Göttingen (AVA), des Aerodynamischen Instituts der Technischen Hochschule Aachen (AIA) und der Rhön-Rossitten-Gesellschaft e.V., Darmstadt (RRG).

Books and Articles^{*}

- Ananoff, A.: L'Astronautique. Paris 1950.
- Arlazorov, M.S.: Ziolkowski. Moskau 1962.
- Barth, H. (Hrsg.): Hermann Oberth. Briefwechsel. Bd. 1. Kriterion Verlag, Bukarest 1979. Bd. 2. Bukarest 1984.
- Barth, H.: Hermann Oberth. „Vater der Raumfahrt“. Esslingen-München 1991.
- Belova, N.G.; Straut, E.K.: Mirovoe prisnanie In: Vperedi swoego veka Moskau 1970, S. 245-267.
- Belova, N.G.: Konstantin Ziolkowski und seine Kontakte zu deutschen Wissenschaftlern. In: Sowjetunion heute, April 1981, Nr. 4, S. 52-55.
- Belova, N.G.; Radskaja, E.M.: Rasprostranenie i ocenka trudov K.E. Ziolkowskogo po kosmonavtike za rubežom. In: K.E. Ziolkowskij: issledovanie naučnogo nasledija i materialy k biografii. Moskau 1989, S. 102-115.
- Bibliography of aeronautics. Washington (D. C.) 1921.
- Birkenmaier, W.: Standorte und Bibliothekare der Russischen Lesehalle. In: Russica Palatina. Skripten der Russischen Abteilung des Instituts für Übersetzen und Dolmetschen der Universität Heidelberg. Nr. 25a. Heidelberger Almanach aus dem Jahre 1912. Übersetzte und erweiterte Ausgabe. Heidelberg 1995, S. 9-11.
- Birkenmaier, W.: Das russische Heidelberg. Wunderhorn 1995.
- Bučarskij, V.V.: Svetjolka vo Vselennoj Kaluga 1998.
- Bücherbesprechungen: J.I. Perelmann. Interplanetare Reisen. In: Die Rakete, 15.05.1929, S. 69-70. O.N.
- Cleator, P.E.: Rockets Through Space. The Dawn of Interplanetary Travel. London 1936 – 2. Aufl. New York 1936.
- Didlof, A.M.: Bücherbesprechungen. In: Die Rakete, 15.05.1928, S. 79.
- Erochin, A.: Trud K.E. Ziolkowskogo v fonde V.I. Lenina. In: Znamja (Kaluga), 02.04.1971, S. 3.
- Esnault-Pelterie, R.: Considération sur les résultats d'un allégement indéfini des moteurs. In: Journal de physique théoretique et appliquée, ser. 5, vol. 3, March 1913, p. 218-231.
- Esnault-Pelterie, R.: L'exploration par fusées de la très haute atmosphère et la possibilité des voyages interplanétaires. Paris 1928.

* **Publisher's Note:** The format of the citations in this section vary from the standard *AAS History Series* format.

- Esnault-Pelterie, R.: Doklad generalu Ferrie. In: Pionery raketnoj techniki. Ganswindt, Goddard, Esnault-Pelterie, Oberth, Hohmann. Isbrannye trudy. Moskau 1977, p. 401-423.
- Esnault-Pelterie, R.: L'Astronautique Die Astronautik. Paris 1930.
- Grimm, H.: Aus meiner Raumschiffkartei. In: Die Rakete, 15.02.1928, S. 27-29.
- Grimm, H.: Aus meiner Raumschiffkartei (Fortsetzung). In: Die Rakete, 15.05.1928, S. 76-77.
- Goddard, R.: A Method of Reaching Extreme Altitudes. Smithsonian Miscellaneous Collections, vol. 71, no. 2, Washington December 1919, p. 337-406.
- Goddard, R.: A Method of Reaching Extreme Altitudes. In: Nature, vol. CV, March 1920 to August 1920, London 26.08.1920, p. 809-811.
- Gluschko, V.P.: Vstupitel'noe clovo. In: Sternfeld, A.A.: Vvedenie v kosmonavtiku. Moskau 1974, S. 3-8.
- Hermann, D.B.: K.E. Ciolkowsky im Spiegel westeuropäischer Raumfahrtliteratur: ein Beitrag zur Wirkungsgeschichte der Ideen von Ciolkowsky. In: Mitteilungen der Archenhold-Sternwarte Berlin-Treptow, Nr. 125 - Sonderdruck aus: NTM, Schriftenreihe für Geschichte der Naturwissenschaften, Technik und Medizin, 1981, Heft 18 (2), S. 8-16.
- Hohmann, W.: Die Erreichbarkeit der Himmelskörper. Untersuchungen über das Raumfahrtproblem. München und Berlin 1925.
- Jelnina, T.N.: K.E. Ziolkowski i pionery kosmonavtiki Germanii. In: Trudy XXVII Čtenij K.E. Ziolkowskogo. Sekcija „Issledovanie naučnogo tvorčestva K.E. Ziolkowskogo i istorija aviacii i kosmonavtiki“. Moskau 1994, S. 3-55. Желнина Т.Н. К.Э. Циолковский и пионеры космонавтики Германии // Труды XXVII Чтений К.Э. Циолковского. Секция «Исследование научного творчества К.Э. Циолковского и история авиации и космонавтики». М., 1994. С. 3-55.
- Jelnina, T.N.: K istoriji izdanija i rasprostranenija stat'i K.E. Ziolkowskogo „Issledovanie mirovych prostranstv reaktivnymi priborami“ (1903). In: Trudy XXIX Čtenij K.E. Ziolkowskogo. Sekcija „Issledovanie naučnogo tvorčestva K.E. Ziolkowskogo i istorija aviacii i kosmonavtiki“. Moskau 1997, S. 3-22. Желнина Т.Н. К истории издания и распространения статьи К.Э. Циолковского «Исследование мировых пространств реактивными приборами» (1903 г.) // Труды XXIX Чтений К.Э. Циолковского. Секция «Исследование научного творчества К.Э. Циолковского и история авиации и космонавтики». М., 1997. С. 3-22.
- Jelnina, T.N.: Tvorčeskaja istorija naučnogo truda K.E. Ziolkowskogo „Issledovanie mirovych prostranstv reaktivnymi priborami“ v literature i istočnikach. In: Trudy regional'nogo konkursa naučnyx proektorov v oblasti gumanitarnykh nauk. Bd. 3. Kaluga 2002, S. 10-37. Желнина Т.Н. Творческая история научного труда К.Э. Циолковского «Исследование мировых пространств реактивными приборами» в литературе и источниках // Труды регионального конкурса научных проектов в области гуманитарных наук. Выпуск 3. Калуга, 2002. С. 10-37.
- Kosmodem'janskij, A.A.: Predislovie. In: Esnault-Pelterie, R.: Kosmičeskie poljoty (Astronautika). Moskau 1950, S. 3 Космодемьянский А.А. Предисловие // Эсно-Пельтири Р. Космические полеты (Астронавтика). М., 1950. С. 3.
- Kosmodem'janskij, A.A.: K.E. Ziolkowski (1857-1935). Moskau 1976. Космодемьянский А.А. К.Э. Циолковский (1857-1935). М., 1976.
- Lademann, R.: Zum Raketenproblem. In: ZFM, 28.04.1927, Heft 8, S. 177-181.
- Lademann R. Arbeitsplan für erste wirkliche Vorversuche mit Rückstossraumschiffen von K.E. Ziolkowski. In: ZFM, 1927, Heft 20. S. 482.

- Lademann, R.: Das Raketen-Auto und seine Vorgänger. In: Der Luftweg, 10.06.1928, Heft 11, S. 119-121.
- Lademann, R.: Rund um die Rakete. In: Illustrierte Flugwoche, 20.06.1928, Heft 4, S. 122-124.
- Lademann, R.: Bücherbesprechungen: Die Möglichkeit der Weltraumfahrt. Hrsg. von W. Ley. In: ZFM, 1929, Heft 2, S. 50.
- Lademann, R.: Buchbesprechung. Fernflug- und Mehrfachraketen. Von K.E. Ziolkowski. In: ZFM, 1930, Heft 12, S. 310.
- Lademann, R.: Den Sternenfahrern. Von K.E. Ziolkowski. In: ZFM, 1930, Heft 20, S. 539.
- Lademann, R.: Fernflug- und Mehrfachraketen. Von K.E. Ziolkowski. In: ZFM, 1930, Heft 12, S. 310.
- Lademann, R.: Das neue Flugzeug. Von K.E. Ziolkowski. In: ZFM, 1931, Heft 20, S. 603.
- Lademann, R.: Ziele der Raumschiffahrt. Von K.E. Ziolkowski. In: ZFM, 1931, Heft 20, S. 604.
- Lent, C.P.: Rocket Research – History and Handbook. Pen-Ink Publishing, New York 11.07.1944.
- Lent, C.P.: Rocketry. Jets and Rockets. The Science of the Reaction Motor and its Practical Application for Aircraft and Space Travel. New York 1947.
- Ley, W. (Hrsg.): Die Möglichkeit der Weltraumfahrt. Allgemeinverständliche Beiträge zum Raumfahrtsproblem. Leipzig 1928, S. 341, 342.
- Ley, W.: Die Fahrt ins Weltall. Leipzig 1929 (2. Aufl.), S. 36-39.
- Ley, W.: Die Fahrt ins Weltall. Der Werdegang des Raumschiffes. Probekapitel. In: Die Rakete, 15.04.1929, S. 60-61.
- Ley, W.: The reader speaks: From the German Interplanetary Society. In: Bulletin of American Interplanetary Society, July 1930, no. 2, p. 4.
- Ley, W.: The reader speaks: From the German Interplanetary Society. In: Air Wonder Stories. New York, September 1930, vol. 2, p. 370.
- Ley, W.: Grundriss einer Geschichte der Rakete. Leipzig 1932, S. 14.
- Ley, W.: On Rockets and Their History. In: Astronautics, August-September 1932, no. 22, p. 4-8; Oktober 1932, no. 23, p. 5-8.
- Ley, W.: Rocketry in Germany. In: Journal of the British Interplanetary Society, April 1934, vol. 1, no. 2, p. 9-12.
- Ley, W.: Rockets. Ancient Art and Modern Science. In: Popular Flying, November 1935, p. 422-425, 461.
- Ley, W.: Some Practical Aspects of Rocketeering. In: Aviation, November 1936, p. 18-20.
- Ley, W.: The Dawn of the Conquest of Space. An Outstanding Article on Rockets. In: Astounding Stories, March 1937, vol. XIX, p. 104-110.
- Ley, W.: Raketensensationen? In: Beilage zu Nr. 2 der „Astronomischen Rundschau“ für die Mitglieder der Gesellschaft für Weltraumforschung E.V., Breslau, April 1938, Heft 2, S. III-V.
- Ley, W.: Rockets. The future of travel beyond the stratosphere. New York 1944.
- Ley, W.: Vorstoss ins Weltall. Rakete und Raumfahrt. Wien 1949.
- Lorenz, H.: Die Möglichkeit der Weltraumfahrt. In: Zeitschrift des Vereins Deutscher Ingenieure, 07.05.1927, Bd. 71, Heft 19, S. 651-654.

- Lorenz, H.: Die Möglichkeit der Weltraumfahrt. In: Zeitschrift des Vereins Deutscher Ingenieure, 06.08.1927, Bd. 71, Heft 32, S. 1128.
- Marcuse, A.: Mit Raketen in den Weltenraum? Utopie oder Wirklichkeit. In: Berliner Tageblatt, 01.12.1926.
- Max Valier: Rocket Martyr. In: Scientific American, August 1930, vol. 143, p. 141-142. O.N.
- Narr, Phantast oder Prophet? Ganzmetall-Luftschiff und Weltraumrakete. In: Kölnische Zeitung, 03.11.1935. O.N.
- Nebel, R.: Raketenflug. Berlin 1932, S. 7.
- Oberth, H.: Die Rakete zu den Planetenräumen. München und Berlin 1923.
- Oberth, H.: Ist die Weltraumfahrt möglich? In: Die Rakete, 15.11.1927, S. 144-152; 15.12.1927, S. 162-166.
- Oberth, H.: Wege zur Raumschiffahrt. München und Berlin 1929.
- Oberth, H. My Contribution to Astronautics Mein Beitrag zur Weltraumfahrt. In: First Steps Toward Space. Proceeding of the First and Second History Symposia of the International Academy of Astronautics at Belgrade, Yugoslavia, 26 September 1967, and New York, U.S.A., 16 October 1968 (Hrsg.: Durant III, F.C.; James, G.S.). AAS History Series, vol. 6. IAA History Series, vol. 1. 1974, p. 129-140 - San Diego, 1985, p. 129-140 - Оберт Г. Мои работы по астронавтике // Из истории астронавтики и ракетной техники. Материалы Международного астронавтического конгресса. Белград, 25-29 сентября 1967 г. (изд-е подг. под рук. В.Н. Сокольского). М., изд. «Наука», 1970. С. 85-96 - Mein Beitrag zur Weltraumfahrt. In: Kroner, Michael: Hermann Oberth. Arbeitshilfe Nr. 41/1984, Bonn 1984, S. 12-16 - Mein Beitrag zur Weltraumfahrt. In: Hermann Oberth – Vater der Raumfahrt (Hrsg.: Bund der Vertriebenen; Hermann-Oberth-Raumfahrt-Museum). Nürnberg/Feucht 1994, S. 1-12.
- Perelmann, J.I.: Mežplanetne putešestvija (doklad, pročitannyj v Russkom obščestve ljubitelej mirovedenija) Interplanetare Reisen, ein Vortrag, gehalten vor den Mitgliedern der Russischen Gesellschaft der Liebhaber der Weltkunde. In: Reč' Die Rede, 22.11.1913, Nr. 320 (Перельман Я.И. Межпланетные путешествия // Речь. 22.11.1913. № 320).
- Perelmann, J.I.: Vozmožny li mežplanetne putešestvija Ob interplanetare Reisen möglich sind. In: Sovremennoe slovo Das zeitgenössische Wissen, 01.12.1913, № 2119, S. 2 (Перельман Я.И. Возможны ли межпланетные путешествия // Современное слово. 01.12.1913. № 2119. С. 2).
- Perelmann, J.I.: Mežplanetne putešestvija Interplanetare Reisen. In: Priroda i ljudi Natur und Menschen, 1914, Nr. 8, S. 126-127 (Перельман Я.И. Межпланетные путешествия // Природа и люди. 1914. № 8. С. 126-127).
- Perelmann, J.I.: Mežplanetne putešestvija. Poljoty v mirovoe prostranstvo i dostiženie nebesnych svetil Interplanetare Reisen. Flüge in den Weltraum und die Erreichung der Sterne. Petrograd 1915 (Перельман Я.И. Межпланетные путешествия. Полеты в мировое пространство и достижение небесных светил. Пг., 1915).
- Philp, C.G.: Stratosphere and Rocket Flight (Astronautics). London 1937.
- Professor Ziolkowski. In: Die Rakete, 15.01.1928, S. 12. O.N.
- Rjumin, V.V.: Na rakete v mirovoje prostranstvo Mit Rakete in den Weltraum. In: Priroda i ljudi Natur und Menschen, 05.07.1912, Nr. 36, S. 556-558 (Рюмин В.В. На ракете в мировое пространство // Природа и люди. 05.07.1912. № 36. С. 556-558).

- Rjumin, V.V.: Reaktivnye dvigateli (fantazija i dejstvitel'nost') Rückstossantrieb (Phantasie und Wirklichkeit). In: Električestvo i žizn' Elektrizität und Leben, 1913, Nr. 1 (Рюмин В.В. Реактивные двигатели (фантазия и действительность) // Электричество и жизнь. 1913. № 1).
- Rjumin, V.V.: Populjarnye očerki i rasskazy, t. I Populäre Skizzen und Erzählungen. Bd. I. Nikolaev 1914, S. 40-48 (Рюмин В.В. Популярные очерки и рассказы. Т. I. Николаев, 1914. С. 40-48).
- Rjumin, V.V.: S Zemli na Lunu i dal'she (grjaduščaja vozmožnost') Von der Erde zum Mond und weiter (eine Möglichkeit von morgen). In: Električestvo i žizn' Elektrizität und Leben, 1914, Nr. 6, S. 241-242 (Рюмин В.В. С Земли на Луну и дальше (грядущая возможность) // Электричество и жизнь. 1914. № 6. С. 241-242).
- Rjumin, V.V.: Novye trudy K.E. Ziolkowskogo Neue Werke von K.E. Ziolkowski. In: Električestvo i žizn' Elektrizität und Leben, 1915, Nr. 9, S. 355 (Рюмин В.В. Новые труды К.Э. Циолковского // Электричество и жизнь. 1915. № 9. С. 355).
- Rodnych, A.A.: Rakety i raketyne korabli Raketen und Raumschiffe. Moskau-Leningrad 1933 (Родных А.А. Пакеты и ракетные корабли. М.-Л., 1933).
- Rolin, L. Pseudonym von A. Sternfeld: Utopie d'hier, possibilité d'aujourd'hui. Peut-on aller de la Terre aux autres planètes? In: L'Humanité. Paris 19.08.-02.09.1930.
- Romanov, A.P.: Ivany zabyvšie Ziolkovskogo. In: Sovetskaja Rossija, 06.10.1992. Nr. 128. S. 3.
- Rynin, N.A.: Mežplanetnye soobščenija Interplanetarer Verkehr. Bd. 5, Teorija reaktivnogo dviješnija Theorie der Rückstossbewegung. Leningrad 1929 (Рынин Н.А. Межпланетные сообщения. Выпуск 5-й. Теория реактивного движения. Л., 1929).
- Rynin, N.A.: Mežplanetnye soobščenija. Bd. 7, Tsiolkovsky, ego žizn', raboty i rakety. Leningrad 1931.
- Rynin, N.A.: Professor Nikolai Aleksejewitsch Rynin Selbstbiographie. In: Brügel, W. (Hrsg.): Männer der Rakete in Selbstdarstellungen von Hans-Wolf Dickhuth-Harrach, Robert Esnault-Pelterie, Prof. R.H. Goddard, Dr. Franz von Hoefft, Willy Ley, C.P. Mason, Prof. Hermann Oberth, Ing. Guido von Pirquet, Prof. N.A. Rynin, Ing. Friedrich Schmiedl, Ing. Johannes Winkler, K.E. Ziolkowsky. Leipzig 1933, S. 79-85.
- Rynin, N.A.: Die GIRD. In: Brügel, W. (Hrsg.): Männer der Rakete in Selbstdarstellungen von Hans-Wolf Dickhuth-Harrach, Robert Esnault-Pelterie, Prof. R.H. Goddard, Dr. Franz von Hoefft, Willy Ley, C.P. Mason, Prof. Hermann Oberth, Ing. Guido von Pirquet, Prof. N.A. Rynin, Ing. Friedrich Schmiedl, Ing. Johannes Winkler, K.E. Ziolkowsky. Leipzig 1933, S. 137-140.
- Sänger, E.: Raketenflugtechnik. München und Berlin 1933, S. 4, 39, 170.
- Schershevsky, A.B.: Internationale Umschau. Sowjet-Russland. K. Ziolkowski... In: Internationale Flug-Woche, 17.08.1921, Heft 17, S. 359.
- Schershevsky, A.B.: K.E. Ziolkowski. Ingenieur... In: Internationale Flug-Woche, 12.10.1921, Heft 21, S. 435.
- Schershevsky, A.B.: Put' k zvezdam. Zabytye stranicy russkoj istorii Der Weg zu den Sternen. Vergessene Seiten der russischen Geschichte. In: Nakanune Am Vorabend (Berlin), 29.12.1923, Nr. 516 – GMIK, f. 1, op. 1, d. 21 (ein Zeitungsausschnitt mit Ziolkowskis Vermerkungen) (Шершевский А.Б. Путь к звездам. Забытые страницы русской истории // Накануне (Берлин). 29.12.1923. № 516. Газетная вырезка с пометками Циолковского: Ф. 1. Оп. 1. Д. 21).
- Schershevsky, A.B.: Die Rakete in den kosmischen Raum. Ausser der Erde. Beides von K.E. Ziolkowski. In: ZFM, 1926, Heft 10, S. 214.

- Scherschevsky, A.B.: Die Verteidigung des Aeronaut. Die Geschichte meines Lenkluftschiffes. Beides von K.E. Ziolkowski. In: ZFM, 1926, Heft 16, S. 347.
- Scherschevsky, A.B.: Mit Raketen in den Weltenraum. In: Berliner Tageblatt, 01.12.1926.
- Scherschevsky, A.B.: Luftreibungswiderstand bei hohen Geschwindigkeiten. In: Flugsport, 19.01.1927, Nr. 2, S. 26-29.
- Scherschevsky, A.B.: Das Problem der Reaktionsraumschiffe und der Reaktionsflugzeuge (nach K.E. Ziolkowski). In: ZAMM, August 1927, Bd. 7, Heft 4, S. 319-321.
- Scherschevsky, A.B.: Das Raumschiff. In: Flugsport, 28.09.1927, Nr. 20, S. 386-398; 12.10.1927, Nr. 21, S. 422-427 – Teorija mežplanetnogo raketnogo korablja Theorie des Raumschiffes mit Raketenantrieb. In: Rynin, N.A.: Mežplanetnye soobščenija. Bd. 8. Teorija kosmičeskogo poljota Interplanetarer Verkehr. Bd. 8. Theorie des Weltraumfluges. Leningrad 1932, S. 299-313 (Теория межпланетного ракетного корабля // Рынин Н.А. Межпланетные сообщения. Вып. 8. Теория космического полета. Л., 1932. С. 299-313).
- Scherschevsky, A.B.: Buchbesprechung. Erste praktische Vorversuche mit Reaktionsraumschiffen. Arbeitsplan und Beschreibung der Versuchsanordnung von K.E. Ziolkowski. In: Der Flug, 1927, 2. Dezemberheft, S. 159-160.
- Scherschevsky, A.B.: Moskauer Vortrag von K.E. Ziolkowski. In: Der Flug, 1928, 2. Märzheft, S. 110.
- Scherschevsky, A.B.: Buchbesprechung. Prof. K.E. Ziolkowski: Luftwiderstand und Schnellbahnen. In: Der Flug, 1928, 2. Märzheft, S. 119.
- Scherschevsky, A.B.: Neue deutsche Arbeit zum Raketenproblem von Robert W.E. Lademann. In: Der Flug, 1928, 1. Aprilheft, S. 124.
- Scherschevsky, A.B.: Buchbesprechung. Prof. Rynin. Weltraumverkehr. In: Der Flug, 1928, 1. Aprilheft, S. 140.
- Scherschevsky, A.B.: Rußlands Arbeit am Raketenproblem. In: Der Flug, 1928. 1. Maiheft, S. 170.
- Scherschevsky, A.B.: Zum Raketenproblem. In: Der Flug, 1928, 2. Maiheft, S. 194-196.
- Scherschevsky, A.B.: Das Problem des Raketenfluges. In: Berliner Tageblatt, 01.08.1928 - Technische Rundschau. Wochenschrift des Berliner Tageblatts, 01.08.1928, Nr. 31, S. 267-268.
- Scherschevsky, A.B.: Die Rakete für Fahrt und Flug. Eine allgemeinverständliche Einführung in das Raketenproblem. Berlin-Scharlottenburg, 1929 Ausg. 1928, S. 75-83, 104-109, 120-129.
- Scherschevsky, A.B.; Ley, W.: Thermodynamik der Rakete. Zum Aufsatz von Oberbaurat Konrad Baetz. In: Maschinekonstrukteur. Zeitschrift für Betrieb und Konstruktion, 15.03.1929, Nr. 6, S. 129-130.
- Scherschevsky, A.B.: Buchbesprechung. Entwurf eines Ganz-Metall-Luftschiffes für 40 Fluggäste. Von K.E. Ziolkowski. In: ZFM, 1931, Heft 23, S. 694.
- Steffler, R.: Die Verbreitung der Raumfahrtidee in Deutschland Anfang der zwanziger Jahre. In: 4. Tag der Raumfahrt-Geschichte. Tagungsband IV. Fachbereich S 7.2 „Geschichte der Raumfahrt“, 24. Juni 2000. Eigenverlag Hermann-Oberth-Raumfahrt-Museum e.V. Feucht 2000, S. 34-42.
- Steffler, R.: Verbindungen der Raumfahrtioniere mit führenden Wissenschaftlern bzw. Vereinigungen 1900 – 1930. In: 7. Tag der Raumfahrt-Geschichte. Tagungsband VII. Fachbereich S 7.2 „Geschichte der Raumfahrt“, 21. Juni 2003. Eigenverlag Hermann-Oberth-Raumfahrt-Museum e.V. Feucht 2003, S. 37-49.

- Sternfeld, A.: Les problèmes de la cosmonautique. In: Les Ailes. Paris, 1934, Nr. 683, p. 4; Nr. 684, p. 7; Nr. 685, p. 4; Nr. 686, p. 4.
- Sternfeld, A.: Quand les poètes montent au ciel. In: Les Nouvelles Littéraires, artistiques et scientifiques. Paris, 1934, Nr. 618, p. 1-2.
- Sternfeld, A.: Irons-nous dans la Lune. In: L'Aéro, Paris, 1934, Nr. 167, p. 4; Nr. 168, p. 4. Nr. 169, p. 3. Nr. 170, p. 4.
- Sternfeld A.J. Les précurseurs et les théoriciens de la cosmonautique. In: La Technique Aéronautique. Paris. 1935. Nr. 135, p. 20-28.
- Sternfeld, A.: Vvedenie v kosmonavtiku Einführung in die Kosmonautik. Eine Übersetzung aus dem Französischen von G.E. Langemak. Moskau-Leningrad 1937 – 2. Ausg. Moskau 1974. (Штернфельд А.А. Введение в космонавтику. М.-Л., 1937 – 2-е изд. М., 1974).
- Sternfeld, A.: Govorjat dokumenty... (1930-1935) Dokumente berichten... (1930-1935). In: K.E. Ziolkowski v vospominanijach sovremennikov K.E. Ziolkowski in den Erinnerungen seiner Zeitgenossen, Tula 1971, S. 59-68 (Штернфельд А.А. Говорят документы... (1930-1935) // К.Э. Циолковский в воспоминаниях современников. Тула, 1971. С. 59-68).
- Svatikov, S.G.: Russische Studenten in Heidelberg. In: Wischhäuser, E. (Hrsg.): Russica Palatina. Skripten der Russischen Abteilung des Instituts für Übersetzen und Dolmetschen der Universität Heidelberg, Nr. 28. Heidelberg 1997.
- Thirring, H.: Kann man in den Weltraum fliegen? In: Alte Probleme - neue Lösungen in den exakten Wissenschaften. Leipzig-Wien 1934, S. 29-55. (55).
- Tichonravov, M.K.: K 60-letiju s načala publikacii 2-oj časti klassičeskogo truda K.E. Ziolkowskogo "Issledovanie mirovych prostranstv reaktivnymi priborami" (1911) Zum 60. Jahrestag der Veröffentlichung des 2. Teils des klassischen Werkes von K.E. Ziolkowski "Die Erforschung der Weltenräume mittels Rückstossgeräten" (1911). In: Is istorii aviacii i kosmonavtiki Aus der Geschichte der Luft- und Raumfahrt, Bd. 12. Moskau 1971, S. 94-95 (Тихонравов М.К. К 60-летию с начала публикации 2-ой части классического труда К.Э. Циолковского „Исследование мировых пространств реактивными приборами” (1911) // Из истории авиации и космонавтики. Вып. 12. М., 1971. С. 94-95).
- Tsiolkovski Is Dead, Designer For Rockets. In: New York Times, 20.09.1935, p. 21. O.N.
- Valier, M.: Das Weltraumschiff. In: Die Einkehr. Unterhaltungsbeilage der "Münchener Neuesten Nachrichten", 10.02.1926, Nr. 12, S. 47.
- Valier, M.: Einwände gegen die Möglichkeit der Weltraumfahrt. In: Die Rakete, 15.08.1927, S.107-110.
- Valier, M.: Raketenfahrt. München und Berlin 1928, S. 171-173.
- Valier, M.: Raketenfahrt. München und Berlin 1930.
- Vejgelin, K.E.: Kak možno doletet' do Luny Wie kann man den Mond erreichen. In: Priroda i ljudi Natur und Menschen, 1914, Nr. 4, S. 53-54 (Вейгелин К.Е. Как можно долететь до Луны // Природа и люди. 1914. № 4. С. 53-54).
- Vetrov, G.S.: Robert Esnault-Pelterie. Moskau 1982 (Ветров Г.С. Робер Эсно-Пельтри. М., 1982).
- Vorob'ev, B.N.: Vstreči s Ziolkowskim Meine Begegnungen mit Ziolkowski. In: Znanie – sila Wissen ist Kraft, 1951, Nr. 1, S. 30-35 (Воробьев Б.Н. Встречи с Циолковским // Знание сила. 1951. № 1. С. 30-35).

- Vorob'ev, B.N.: Raboty K.E. Ziolkowskogo po mežplanetnym soobščenijam K.E. Ziolkowskis Arbeiten zum Problem des interplanetaren Verkehrs. In: Ziolkowski K.E. Vne Zemli Ausserhalb der Erde. Moskau 1958, S. 5-20 (Воробьев Б.Н. Работы К.Э. Циолковского по межпланетным сообщениям // Циолковский К.Э. Вне Земли. М., 1958. С. 5-20).
- Vorob'ev, B.N.: Vstreči s Konstantinom Eduardovičem Meine Begegnungen mit Konstantin Eduardovič Ziolkowski. In: Ziolkowski v vospominanijach sovremennikov K.E. Ziolkowski in den Erinnerungen seiner Zeitgenossen. Tula 1971, S. 29-39 (Воробьев Б.Н. Встречи с Константином Эдуардовичем // Циолковский в воспоминаниях современников. Тула, 1971. С. 29-39).
- Winkler, J.: Der gegenwärtige Stand des Raumfahrtgedankens in Deutschland. In: Die Rakete, 15.04.1927, S. 34.
- Winkler, J.: Der erste Aufstieg noch im August? In: Die Rakete, 15.08.1927, S. 112.
- Winter, F.H.: Birth of the VfR: The Start of Modern Astronautics. In: Spaceflight, August 1977, no. 19, p. 243-256.
- Winter, F.H.: Prelude to the Space Age. The Rocket Societies: 1924-1940. Washington 1983.
- Winter, F.H.: Rockets into Space. Cambridge, Massachusetts, London 1990.
- Winter, F.H.: Was Hermann Oberth the True Father of Spaceflight? In: Ad Astra, November/December 1996, p. 40-42.
- Wyld, J.H.: The Liquid-Propellant Rocket Motor – Past, Present and Future. In: Journal of the American Rocket Society. 1946 oder 1947, p. 2-15. Ausschnitt in: HORM/A, Heinz Gartmann Sammlung.
- Zander, F.A.: Doklad inženera F.A. Zander'a o svojom izobretenii: aeroplane dlja vyleta iz zemnoj atmosfery, dlja pereljota na drugie planety i o snačenii razvitiija aviačii v označennom napravlenii Vortrag des Ingenieurs F.A. Zander über seine Erfindung: einen Aeroplana für den Flug über die Atmosphäre hinaus zu den anderen Planeten und über die Bedeutung der Luftfahrt für die Lösung dieser Aufgabe, April 1923. In: ders.: Is naučnogo nasledija Aus dem wissenschaftlichen Nachlass. Moskau 1967, S. 10-14 (Цандер Ф.А. Доклад инженера Ф.А. Цандера о своем изобретении: аэроплане для вылета из земной атмосферы, для перелета на другие планеты и о значении развития авиации в означенном направлении (апрель 1923 г.) // Из научного наследия. М., 1967. С. 10-14).
- Ziolkowski, K.E.: Issledovanie mirovych prostranstv reaktivnymi priborami "Die Erforschung der Weltenräume mittels Rückstossgeräten". In: Naučnoe obozrenie Wissenschaftliche Rundschau, 1903, Nr. 5, S. 45-75 (Циолковский К.Э. Исследование мировых пространств реактивными приборами // Научное обозрение. 1903. № 5. С. 45-75).
- Ziolkowski, K.E.: Reaktivnyj pribor kak sredstvo poljota v pustote i atmosfere Das Rückstossgerät als Mittel für den Flug im luftleeren Raum und in der Atmosphäre. In: Vozduchoplavatel' Der Luftfahrer, 1910, Nr. 2, S. 110-113 (Циолковский К.Э. Реактивный прибор как средство полета в пустоте и атмосфере // Воздухоплаватель. 1910. № 2. С. 110-113).
- Ziolkowski, K.E.: Zaščita aeronata Die Verteidigung des Aeronat. Kaluga 1911.
- Ziolkowski, K.E.: Issledovanie mirovych prostranstv reaktivnymi priborami "Die Erforschung der Weltenräume mittels Rückstossgeräten". In: Vestnik vozduchoplavaniya Der Luftfahrbote, 1911, Nr. 19, S. 16-21; Nr. 20, S. 29-32; Nr. 21-22, S. 31-37; 1912, Nr. 2, S. 2-7; Nr. 3, S. 15-16; Nr. 5, S. 2-5; Nr. 6-7, S. 6-9; Nr. 9, S. 7-11 (Циолковский К.Э. Исследование мировых пространств реактивными приборами // Вестник воздухоплавания. 1911. № 19. С. 16-21. № 20. С. 29-32. № 21-22. С. 31-37. 1912. № 2. С. 2-7. № 3. С. 15-16. № 5. С. 2-5. № 6-7. С. 6-9. № 9. С. 7-11).

- Ziolkowski, K.E.: Issledovanie mirovych prostranstv reaktivnymi priborami "Die Erforschung der Weltenräume mittels Rückstossgeräten". Kaluga 1914 (Циолковский К.Э. Исследование мировых пространств реактивными приборами. Калуга, 1914).
- Ziolkowski, K.E.: Vne Zemli Ausserhalb der Erde. In: Priroda i ljudi Natur und Menschen, 1918, Nr. 2, S. 23-24; Nr. 3, S. 44-45; Nr. 4, S. 62-64; Nr. 5, S. 78-80; Nr. 6, S. 94-96; Nr. 7, S. 107-108, Nr. 8, S. 124-126; Nr. 9, S. 138-141; Nr. 10, S. 154-158; Nr. 11, S. 171-176; Nr. 12, S. 187-189; Nr. 13, S. 204-207; Nr. 14, S. 216-217 (Циолковский К.Э. Вне Земли // Природа и люди. 1918. № 2. С. 23-24. № 3. С. 44-45. № 4. С. 62-64. № 5. С. 78-80. № 6. С. 94-96. № 7. С. 107-108. № 8. С. 124-126. № 9. С. 138-141. № 10. С. 154-158. № 11. С. 171-176. № 12. С. 187-189. № 13. С. 204-207. № 14. С. 216-217).
- Ziolkowski, K.E.: Vne Zemli Ausserhalb der Erde. Kaluga 1920 (Циолковский К.Э. Вне Земли. Калуга, 1920).
- Ziolkowski, K.E.: Bogatstva Vselennoj Reichtümer des Weltalls. Kaluga 1920 (Циолковский К.Э. Богатства Вселенной. Калуга, 1920).
- Ziolkowski, K.E.: Raketa v kosmicheskoe prostranstvo Eine Rakete in den kosmischen Raum. Kaluga 1924 (Циолковский К.Э. Ракета в космическое пространство. Калуга, 1924).
- Ziolkowski, K.E.: Sud'ba myslitelej ili dwadcat' let pod spudom Das Schicksal der Denker oder zwanzig Jahre in der Vergessenheit, 1923. In: ders.: Ziolkowski, K.E.: Raketa v kosmicheskoe prostranstvo Eine Rakete in den kosmischen Raum. Kaluga 1924, S. II-VII.
- Ziolkowski, K.E.: Issledovanie mirovych prostranstv reaktivnymi priborami "Die Erforschung der Weltenräume mittels Rückstossgeräten". Kaluga 1926 (Циолковский К.Э. Исследование мировых пространств реактивными приборами. Калуга, 1926).
- Ziolkowski, K.E.: Kosmicheskaja raketa. Opytnaja podgotovka Die Weltraumrakete. Experimentelle Vorbereitung. Kaluga 1927 (Циолковский К.Э. Космическая ракета. Опытная подготовка. Калуга, 1927).
- Ziolkowski, K.E.: Isdannye trudy K.E. Ziolkowskogo Die veröffentlichten Werke von K.E. Ziolkowski. Kaluga 1927 (Циолковский К.Э. Изданные труды К.Э. Циолковского. Калуга, 1927).
- Ziolkowski, K.E.: Celi zvesdoplavaniya Ziele der Raumfahrt. Kaluga 1929 (Циолковский К.Э. Цели звездоплавания. Калуга, 1929).
- Ziolkowski, K.E.: Kosmicheskie raketnye poezda Kosmische Raketenzüge. Kaluga 1929 (Циолковский К.Э. Космические ракетные поезда. Калуга, 1929).
- Ziolkowski, K.E.: Novyj aeroplan Der neue Aeroplan. In: ders.: Novyj aeroplan. Za atmosferoj Zemli. Reaktivnyj dvigatel' Der neue Aeroplan. Jenseits der Erdatmosphäre. Das Rückstosstriebwerk. Kaluga 1929, S.
- Ziolkowski, K.E.: Za atmosferoj Zemli Jenseits der Erdatmosphäre. In: ders.: Novyj aeroplan. Za atmosferoj Zemli. Reaktivnyj dvigatel' Der neue Aeroplan. Jenseits der Erdatmosphäre. Das Rückstosstriebwerk. Kaluga 1929, S. 25-33 (Циолковский К.Э. За атмосферой Земли // Циолковский К.Э. Новый аэроплан. За атмосферой Земли. Реактивный двигатель. Калуга, 1929. С. 25-33).
- Ziolkowski, K.E.: Predislovie Vorwort. In: Perel'mann J.I.: Mežplanetnye putešestviya Interplanetare Reisen, 6. Aufl. Leningrad 1929, S. 6 – ARAN, f. 555, op. 2, d. 15, l. 2-3 (Циолковский К.Э. Предисловие // Перельман Я.И. Межпланетные путешествия. 6-е изд. Л., Прибой, 1929. С. 6 - АРАН. Ф. 555. Оп. 2. Д. 15. Л. 2-3).
- Ziolkowski, K.E.: Reaktivnyj aeroplan Der rückstoßgetriebene Aeroplan. Kaluga 1930 (Циолковский К.Э. Реактивный аэроплан. Калуга, 1930).

- Ziolkowski, K.E.: Zvezdoplavateljam An Sternenreisende. Kaluga 1930 (Циолковский К.Э. Звездоплавателям. Калуга, 1930).
- Ziolkowski, K.E.: Ot samoljota k zvezdoljotu Vom Flugzeug zum Sternenflugzeug. In: Iskry nauki Funken der Wissenschaft, 1930, Nr. 2, S. 55-57 (Циолковский К.Э. От самолета к звездолету // Искры науки. 1930. № 2. С. 55-57).
- Ziolkowski, K.E.: Stratoplan polureaktivnyj Der Stratoplan mit einem Luftstrahltriebwerk. Kaluga 1932 (Циолковский К.Э. Стратоплан полуреактивный. Калуга, 1932).
- Ziolkowski, K.E.: Zvezdoljot Das Sternenflugzeug. In: Znanie – sila Wissen ist Kraft, 1932, Nr. 23-24, S. 15 (Циолковский К.Э. Звездолет // Знание-сила. 1932. № 23-24. С. 15).
- Ziolkowski, K.E.: Isbrannye trudy K.E. Ziolkovskogo. Cel'nometalličeskij dirižabl'. Kniga 1-ja Ausgewählte Werke von K.E. Ziolkowski. Bd. 1. Ganzmetallluftschiff Moskau 1934 (Избранные труды К.Э. Циолковского. Цельнометаллический дирижабль. Книга 1-я. М., 1934).
- Ziolkowski, K.E.: Isbrannye trudy K.E. Ziolkovskogo. Reaktivnoe dviženie. Kniga 2-ja Ausgewählte Werke von K.E. Ziolkowski. Bd. 2. Rückstossbewegung Moskau 1934 (Избранные труды К.Э. Циолковского. Реактивное движение. Книга 2-я. М., 1934).
- Ziolkowski, K.E.: Raketnye pribory v issledovanii stratosfery Raketengeräte in der Stratosphärenforschung. In: Rabočaja Moskva Moskau – die Stadt der Werktaetigen, 03.03.1935 (Циолковский К.Э. Ракетные приборы в исследовании стратосферы // Рабочая Москва. 03.03.1935).
- Ziolkowski, K.E.: Dostiženie kosmičeskoj skorosti Das Erreichen der kosmischen Geschwindigkeit. In: Technika Die Technik, 30.04.1935 (Циолковский К.Э. Достижение космической скорости // Техника. 30.04.1935).
- Ziolkowski, K.E.: Čerty iz moej žizni Mein Leben in grossen Zügen, 1934 - Januar 1935. In: ARAN, f. 555, op. 2, d. 14, l. 1-29 mit Rückseite (Циолковский К.Э. Черты из моей жизни. 1934 г. - январь 1935 г. // АРАН. Ф. 555. Оп. 2. Д. 14. Л. 1-29об.).
- Zu den Tagesfragen. K.E. Ziolkowski. In: Sowjetwirtschaft und Aussenhandel. Halbmonatsschrift der Handelsvertretung der UdSSR in Deutschland, 1935, Nr. 18, S. 1-2. O.N.

Letters*

- Association international biocosmique an K.E. Ziolkowski, 24.10.1929; April 1934. In: ARAN, f. 555, op. 3, d. 200, l. 12-13.
- Beck, A. an K.E. Ziolkowski, 01.05.1934. In: ARAN, f. 555, op. 4, d. 84, l. 1-2.
- Bibliothek der Preussischen Akademie der Wissenschaften an K.E. Ziolkowski, 08.02.1927. In: ARAN, f. 555, op. 3, d. 200, l. 1.
- Brügel, W. an K.E. Ziolkowski, 02.08.1933. In: ARAN, f. 555, op. 4, d. 120, l. 1-1ob.
- Brügel, W. an K.E. Ziolkowski, 24.01.1934. In: ARAN, f. 555, op. 4, d. 120, l. 3.
- Brügel, W. an K.E. Ziolkowski, 20.04.1934. In: ARAN, f. 555, op. 4, d. 120, l. 4.
- Buchhandlung Schneider and Amelang an K.E. Ziolkowski, 26.04.1927. In: ARAN, f. 555, op. 3, d. 200, l. 2.

* Publisher's Note: The format of the citations in this section vary from the standard *AAS History Series* format.

- Burljuk, D.D. an K.E. Ziolkowski, 18.02.1926. In: ARAN, f. 555, op. 4, d. 482, l. 33-33ob.
- Čiževskij, A.L. an K.E. Ziolkowski, 21.03.1928. In: ARAN, f. 555, op. 4, d. 689, l. 45-46ob.
- Čiževskij, A.L. an K.E. Ziolkowski, bis 01.04.1928. In: ARAN, f. 555, op. 4, d. 689, l. 48-48ob.
- Čiževskij, A.L. an K.E. Ziolkowski, 28.04.1928. In: ARAN, f. 555, op. 4, d. 689, l. 49.
- Gluschko, V.P. an K.E. Ziolkowski, 26.09.1923. In: ARAN, f. 555, op. 4, d. 178, l. 1-1ob.
- Gluschko, V.P. an K.E. Ziolkowski, 22.01.1927. In: ARAN, f. 555, op. 4, d. 178, l. 13-14ob.
- Hirsch, A. an H. Oberth, 07.06.1929. In: BWA, F5, Oberth. Rakete bzw. Raumschiffahrt, 24.01.29 – 28.12.29.
- Jakobsen, F. an K.E. Ziolkowski, 04.12.1926. In: ARAN, f. 555, op. 4, d. 725, l. 1, 2.
- Lademann, R. an K.E. Ziolkowski, bis 27.05.1927. In: ARAN, f. 555, op. 4, d. 340, l. 26 (nur Briefumschlag).
- Lademann, R. an K.E. Ziolkowski, 14.06.1927. In: ARAN, f. 555, op. 4, d. 340, l. 1.
- Lademann, R. an K.E. Ziolkowski, 11.07.1927. In: ARAN, f. 555, op. 4, d. 340, l. 3-4.
- Lademann, R. an K.E. Ziolkowski, 05.11.1927. In: ARAN, f. 555, op. 4, d. 340, l. 5-6.
- Lademann, R. an K.E. Ziolkowski, 28.12.1927. In: ARAN, f. 555, op. 4, d. 340, l. 7-8.
- Lademann, R. an K.E. Ziolkowski, bis 11.06.1928. In: ARAN, f. 555, op. 4, d. 340, l. 22 (nur Briefumschlag).
- Lademann, R. an K.E. Ziolkowski, 24.06.1928. In: ARAN, f. 555, op. 4, d. 340, l. 9.
- Lademann, R. an K.E. Ziolkowski, 07.07.1929. In: ARAN, f. 555, op. 4, d. 340, l. 14.
- Lademann, R. an K.E. Ziolkowski, bis 31.07.1929. In: ARAN, f. 555, op. 4, d. 340, l. 23 (nur Briefumschlag).
- Lademann, R. an K.E. Ziolkowski, 24.12.1929. In: Ziolkowski, K.E. Naučnaja etika Wissenschaftliche Ethik. Kaluga 1930, S. 49-50 (Циолковский К.Э. Научная этика. Калуга. 1930. С. 49-50); ARAN, f. 555, op. 4, d. 340, l. 24 (nur Briefumschlag).
- Lademann, R. an K.E. Ziolkowski, Januar 1930. In: Ziolkowski, K.E. Naučnaja etika Wissenschaftliche Ethik. Kaluga 1930, S. 57 („kurzgefasster Inhalt des Briefes“) (Циолковский К.Э. Научная этика. Калуга. 1930. С. 57, «краткое содержание письма»).
- Lademann, R. an K.E. Ziolkowski, 15.04.1930. In: ARAN, f. 555, op. 4, d. 340, l. 16.
- Ley, W. an J.I. Perelmann, 21.06.1929. In: ARAN SPO, f. 796, op. 3, d. 6, l. 12-13.
- Ley, W. an K.E. Ziolkowski, bis 27.08.1928. In: ARAN, f. 555, op. 4, d. 355, l. 46 (nur Briefumschlag).
- Ley, W. an K.E. Ziolkowski, 05.09.1928. In: ARAN, f. 555, op. 4, d. 355, l. 1-2.
- Ley, W. an K.E. Ziolkowski, 16.09.1928. In: ARAN, f. 555, op. 4, d. 355, l. 3.
- Ley, W. an K.E. Ziolkowski, 05.05.1929. In: ARAN, f. 555, op. 4, d. 355, l. 5.
- Ley, W. an K.E. Ziolkowski, 20.09.1929. In: ARAN, f. 555, op. 4, d. 355, l. 7.
- Ley, W. an K.E. Ziolkowski, bis 06.06.1930. In: ARAN, f. 555, op. 4, d. 355, l. 44 (nur Briefumschlag).
- Ley, W. an K.E. Ziolkowski, bis 19.11.1930. In: ARAN, f. 555, op. 4, d. 355, l. 45 (nur Briefumschlag).

- Ley, W. an K.E. Ziolkowski, bis 03.12.1930. In: ARAN, f. 555, op. 4, d. 355, l. 43 (nur Briefumschlag).
- Ley, W. an K.E. Ziolkowski, bis 02.04.1931. In: ARAN, f. 555, op. 4, d. 355, l. 42 (nur Briefumschlag).
- Ley, W. an K.E. Ziolkowski, 10.10.1932. In: Konstantin Eduardovič Ziolkowski (1857-1932). Naučno-jubilejnyj sbornik, posvjaščennyj 75-letiju so dnya roždenija K.E. Ziolkowskogo Konstantin Eduardovič Ziolkowski (1857-1932). Jubiläumsband anlässlich des 75. Geburtstages von K.E. Ziolkowski. Moskau-Leningrad 1932, S. 56 (Константин Эдуардович Циолковский (1857-1932). Научно-юбилейный сборник, посвященный 75-летию со дня рождения К.Э. Циолковского. М.-Л. 1932. С. 56).
- Locher, H.V. an K.E. Ziolkowski, 28.01.1928. In: ARAN, f. 555, op. 4, d. 363, l. 1.
- Oberth, H. an D.B. Hermann, 29.06.1979. In: Barth, H. (Hrsg.): Hermann Oberth. Briefwechsel. Bd. 2. Kriterion Verlag, Bukarest 1984, S. 218-219.
- Oberth, H. an F. von Hoefft, 22.05.1925. In: Barth, H. (Hrsg.): Hermann Oberth. Briefwechsel. Bd. 1. Kriterion Verlag, Bukarest 1979, S. 55-56.
- Oberth, H. an F. von Hoefft, 05.03.1927. In: Barth, H. (Hrsg.): Hermann Oberth. Briefwechsel. Bd. 1. Kriterion Verlag, Bukarest 1979, S. 94.
- Oberth, H. an W. Hohmann, 07.07.1925. In: Hermann Oberth. Briefwechsel. Bd. 1. Kriterion Verlag, Bukarest 1979, S. 62-65.
- Oberth, H. an den Verlag von R. Oldenbourg, 24.04.1925. In: BWA, F5, S. 1-2.
- Oberth, H. an den Verlag von R. Oldenbourg, 25.05.1925. In: BWA, F5, S. 1.
- Oberth, H. an den Verlag von R. Oldenbourg, 14.07.1925. In: BWA, F5, S. 1.
- Oberth, H. an den Verlag von R. Oldenbourg, 10.11.1926. In: BWA, F5, S. 1.
- Oberth, H. an den Verlag von R. Oldenbourg, 27.04.1927. In: BWA, F5, S. 1-2.
- Oberth, H. an den Verlag von R. Oldenbourg, 07.07.1929. In: BWA, F5, Oberth. Rakete bzw. Raumschiffahrt. 24.01.1929 bis 28.12.1929, S. 1.
- Oberth, H. an O. Wiemer, 21.02.1933. In: Barth, H. (Hrsg.): Hermann Oberth. Briefwechsel. Bd. 1. Kriterion Verlag, Bukarest 1979, S. 115-117.
- Oberth, H. an K.E. Ziolkowski, 18.09.1929. In: ARAN, f. 555, op. 4, d. 357, l. 1 – Barth, H. (Hrsg.): Hermann Oberth. Briefwechsel. Bd. 1. Kriterion Verlag, Bukarest 1979, S. 8.
- Oberth, H. an K.E. Ziolkowski, 24.10.1929. In: ARAN, f. 555, op. 4, d. 357, l. 4 – Barth, H. (Hrsg.): Hermann Oberth. Briefwechsel. Bd. 1. Kriterion Verlag, Bukarest 1979, S. 8-9.
- Oberth, H. an K.E. Ziolkowski, 07.11.1930. In: ARAN, f. 555, op. 4, d. 357, l. 6 - Barth, H. (Hrsg.): Hermann Oberth. Briefwechsel. Bd. 1. Kriterion Verlag, Bukarest 1979, S. 9.
- Oberth, H. an einen unbekannten „Herrn Major, Landsmann“, 27.02.1958. In: PA/KR, Abschrift, Kopie, S. 1-3.
- Perelmann, J.I. an W. Ley, 17.06.1929. In: ARAN/S-PO, f. 796, op. 3, d. 6, l. 8-11.
- Perelmann, J.I. an W. Ley, 12.06.1929. In: ARAN/S-PO, f. 796, op. 3, d. 6, l. 4-7.
- Perelmann, J.I. an K.E. Ziolkowski, 24.03.1928. In: ARAN, f. 555, op. 4, d. 482, l. 43.
- Perelmann, J.I. an K.E. Ziolkowski, 28.04.1928. In: ARAN, f. 555, op. 4, d. 482, l. 48-49.
- Schershevsky, A.B. an K.E. Ziolkowski, 22.12.1921. In: ARAN, f. 555, op. 4, d. 698, l. 1-2.
- Schershevsky, A.B. an K.E. Ziolkowski, 02.01.1926. In: ARAN, f. 555, op. 4, d. 698, l. 4-9.

- Scherschevsky, A.B. an K.E. Ziolkowski, 30.06.1926. In: ARAN, f. 555, op. 4, d. 698, l. 10-11.
- Scherschevsky, A.B. an K.E. Ziolkowski, 22.10.1926. In: ARAN, f. 555, op. 4, d. 698, l. 12a.
- Scherschevsky, A.B. an K.E. Ziolkowski, 08.11.1926. In: ARAN, f. 555, op. 4, d. 698, l. 22ob.
- Scherschevsky, A.B. an K.E. Ziolkowski, 23.11.1926. In: ARAN, f. 555, op. 4, d. 698, l. 24.
- Scherschevsky, A.B. an K.E. Ziolkowski, 08.12.1926. In: ARAN, f. 555, op. 4, d. 698, l. 25-30.
- Scherschevsky, A.B. an K.E. Ziolkowski, 29.12.1926. In: Ziolkowski, K.E.: Um i strasti Die Vernunft und die Leidenschaften. Kaluga, 1928, S. 23 (Циолковский К.Э. Ум и страсти. Калуга. 1928. С. 23).
- Scherschevsky, A.B. an K.E. Ziolkowski, 01.01.1927. In: ARAN, f. 555, op. 4, d. 698, l. 32-33ob.
- Scherschevsky, A.B. an K.E. Ziolkowski, 25.03.1927. In: ARAN, f. 555, op. 4, d. 698, l. 35-36ob.
- Scherschevsky, A.B. an K.E. Ziolkowski, 11.04.1927. In: ARAN, f. 555, op. 4, d. 698, l. 38-39ob.
- Scherschevsky, A.B. an K.E. Ziolkowski, bis 02.05.1927. In: ARAN, f. 555, op. 4, d. 698, l. 41 (nur Briefumschlag).
- Scherschevsky, A.B. an K.E. Ziolkowski, bis 03.05.1927. In: ARAN, f. 555, op. 4, d. 698, l. 42-43ob.
- Scherschevsky, A.B. an K.E. Ziolkowski, 25.07.1927. In: ARAN, f. 555, op. 4, d. 698, l. 45-46ob.
- Scherschevsky, A.B. an K.E. Ziolkowski, 31.08.1927. In: ARAN, f. 555, op. 4, d. 698, l. 47-48ob.
- Scherschevsky, A.B. an K.E. Ziolkowski, 25.10.1927. In: ARAN, f. 555, op. 4, d. 698, l. 50.
- Scherschevsky, A.B. an K.E. Ziolkowski, bis 04.11.1927. In: ARAN, f. 555, op. 4, d. 698, l. 71 (nur Briefumschlag).
- Scherschevsky, A.B. an K.E. Ziolkowski, 21.12.1927. In: ARAN, f. 555, op. 4, d. 698, l. 60-61.
- Scherschevsky, A.B. an K.E. Ziolkowski, 29.05.1929. In: ARAN, f. 555, op. 4, d. 698, l. 63-64ob.
- Scherschevsky, A.B. an K.E. Ziolkowski, 04.12.1929. In: ARAN, f. 555, op. 4, d. 698, l. 65-66ob.
- Schulsternwarte der Universität Berlin an K.E. Ziolkowski, 27.01.1928. In: In: ARAN, f. 555, op. 4, d. 363, l. 1.
- Sternfeld, A. an K.E. Ziolkowski, 11.06.1930. In: APAH, f. 555, op. 4, d. 708, l. 1-2; l. 3-4 Anhang: Übersetzung aus dem Buch von R. Esnault-Pelterie, 1930, p. 22-24.
- Sternfeld, A. an K.E. Ziolkowski, 30.06.1930. In: APAH, f. 555, op. 4, d. 708, l. 7-8.
- Sternfeld, A. an K.E. Ziolkowski, 12.09.1930. In: APAH, f. 555, op. 4, d. 708, l. 10.
- Sternfeld, A. an K.E. Ziolkowski, 16.01.1932. In: APAH, f. 555, op. 4, d. 708, l. 21.
- Sternfeld, A. an K.E. Ziolkowski, 26.06.1934. In: APAH, f. 555, op. 4, d. 708, l. 22.
- Sternfeld, A. an K.E. Ziolkowski, 11.11.1934. In: APAH, f. 555, op. 4, d. 708, l. 23.
- Valier, M. an H. Oberth, 30.01.1927. In: Essers, I.: Max Valier. Ein Vorkämpfer der Weltraumfahrt. 1895-1930. Technikgeschichte in Einzeldarstellungen, Nr. 5. Düsseldorf 1968, S. 164-166.
- Verein für Raumschiffahrt an K.E. Ziolkowski, 08.10.1932. In: Konstantin Eduardovič Ziolkowski (1857-1932). Naučno-jubilejnyj sbornik, posvjaščennyj 75-letiju so dnja roždenija K.E. Ziolkowskogo Konstantin Eduardovič Ziolkowski (1857-1932). Jubiläumsband anlässlich des 75. Geburtstages von K.E. Ziolkowski. Moskau-Leningrad 1932, S. 55-56 (Константин Эдуардович Циолковский (1857-1932). Научно-юбилейный сборник, посвященный 75-летию со дня рождения К.Э. Циолковского. М.-Л. 1932. С. 55-56).

- Verlag von R. Oldenbourg an W. Hohmann, 19.01.1925. In: BWA, F5, S. 1.
- Verlag von R. Oldenbourg an R. Lademann, 12.12.1927. In: ARAN, f. 555, op. 3, d. 137, 1.
- Verlag von R. Oldenbourg an H. Oberth, 16.04.1925. In: S. BWA, F5, S. 1-2.
- Verlag von R. Oldenbourg an H. Oberth, 22.07.1926. In: BWA, F5, S. 1.
- Verlag von R. Oldenbourg an K.E. Ziolkowski, 25.04.1927. In: ARAN, f. 555, op. 3, d. 137, l. 2.
- Verlag von R. Oldenbourg an K.E. Ziolkowski, 12.12.1927. In: ARAN, f. 555, op. 3, d. 137, l. 3.
- Vorreiter, Ansbert und Anna an K.E. Ziolkowski, 27.12.1928. In: ARAN, f. 555, op. 4, d. 651, l. 2.
- Vorreiter, Ansbert und Anna an K.E. Ziolkowski, 22.12.1934. In: ARAN, f. 555, op. 4, d. 651, l. 1.
- Zeitschrift «*Verein Deutscher Ingeneure*» an K.E. Ziolkowski, 28.10.1930. In: ARAN, f. 555, op. 3, d. 200, l. 5.
- Ziolkowski, K.E. an W. Brügel, Entwurf, nach dem 20.04.1934. In: ARAN, f. 555, op. 4, d. 129, l. 5.
- Ziolkowski, K.E. an R. Lademann, Entwurf, 22.06.1927. In: ARAN, f. 555, op. 4, d. 14, l. 1.
- Ziolkowski, K.E. an R. Lademann, Entwurf, nach dem 13.10.1928. In: GMIK, f. 1, op. 3, d. 21, l. 2-3.
- Ziolkowski, K.E. an R. Lademann, Entwurf, 24.04.1930. In: ARAN, f. 555, op. 4, d. 14, l. 2.
- Ziolkowski, K.E. an W. Ley, Entwurf, 14.05.1929. In: ARAN, f. 555, op. 4, d. 16, l. 1.
- Ziolkowski, K.E. an H. Oberth, Entwurf, 03.11.1929. In: ARAN, f. 555, op. 4, d. 457, l. 4-5.
- Ziolkowski, K.E. an A.B. Scherschevsky, Entwurf, 31.03.1927. In: ARAN, f. 555, op. 2, d. 46, l. 1 (Rückseite), 2.
- Ziolkowski, K.E. an A.B. Scherschevsky, Entwurf, nach dem 10.12.1929 bis 12.12.1929. In: ARAN, f. 555, op. 4, d. 29, l. 2ob.
- Ziolkowski, K.E. an A.B. Scherschevsky. 12.12.1929. In: Ziolkowski, K.E.: Davlenie na ploskost' pri ejo normal'nom dviženii v vozduche Der Druck auf eine Tragfläche bei ihrer normalen Bewegung in der Luft. Kaluga 1929, S. 48-49: Moj otvet A.B. Scherschevskomu Meine Antwort an A.B. Scherschevsky (Мой ответ А.Б. Шершевскому. 12.12.1929 г. // Циолковский К.Э. Давление на плоскость при ее нормальном движении в воздухе. Калуга, 1929. С. 48-49).
- Ziolkowski, K.E. an A. Sternfeld, 14.06.1934. In: ARAN, f. 555, op. 1, d. 111, l. 24-24ob., 25-25ob. (Autograph); op. 4, d. 30, l. 1 (Fotokopie).
- Ziolkowski, K.E. an A. Sternfeld, 04.07.1934. In: Sternfeld, A. Vvedenie v kosmonavtiku Einführung in die Kosmonautik. 2. Aufl. Moskau 1974, S. 5.
- Ziolkowski, K.E. an den Verlag von R. Oldenbourg, Entwurf, 01.04.1927. In: ARAN, f. 555, op. 2, d. 46, l. 1.
- Ziolkowski, K.E. an den Verlag von R. Oldenbourg. 02.04.1927. In: BWA, F5, Verlagsanerbieten abgelehnte, 1927, M-Z, S. 1-2.
- Ziolkowski, K.E.: Vermerk auf dem Briefumschlag. 26.03.1928. In: ARAN, f. 555, op. 4, d. 482, l. 44.
- Ziolkowski, K.E. an Zander F.A., 23.05.1924. In: ARAN, f. 573, op. 4, d. 27, l. 2.