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To the Arctic in a balloon... This idea possessed the minds of many European researchers in the late 19th century. Even today, when we know a lot about the Arctic and tourists can travel to the North Pole by icebreaker, a balloon flight over the vast Arctic Ocean seems a bold adventure.

In the past, only the bravest ones could even dream of such a mission. Although the amazing flight to the North Pole made by Swedish polar explorer Salomon Andrée in the summer of 1897 ended in a tragedy, daring scientists and explorers continued to make plans for conquering the Arctic

To the ARCTIC In a BALLOON

A Discovery in the Archive Collection of the Polar Commission



Ernst Kohlschütter, Fridtjof Nansen, and Captain Walther Bruns at a meeting of the International Society for the Exploration of the Arctic Regions by Means of the Airship (Aeroarctic). Berlin, Germany. Public domain. Top right: the map from the article "The USSR and Bruns' project." *Samolet Magazine*, N 10(24), 1925. Public domain



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The success of international scientific meteorological observations initiated by Russian inventor Mikhail M. Pomortsev, which were conducted using unmanned aerial vehicles such as balloons, probes, and aerostats, confirmed the theoretical feasibility of studying the Earth's geography from the air. In 1909, the renowned Norwegian polar explorer Fridtjof Nansen sent a letter to German meteorologist Prof. Heinrich Hergesell, where he expressed his enthusiastic support of this idea and proposed to prioritize meteorology, hydrography, and geography studies of the Arctic, which played a decisive role in shaping the planet's climate.

This idea could be put to practice through the development of the dirigible, i.e., a controlled airship. The first steps in this direction were taken as early as in 1910 with the support of Ferdinand von Zeppelin, the founder of Luftschiffbau ZEPPELIN GmbH. Back then, a small expedition, including both Hergesell and Zeppelin, set out for the Spitsbergen archipelago to assess the feasibility of an exploratory flight.

In 1913, the hydrographic studies in the Arctic that had been conducted for years by the Russian Arctic Ocean Hydrographic Expedition achieved an unexpected success; i.e., they discovered an archipelago north of the Taimyr

Key words: Aeroarctic Society, trans-Arctic expedition, aeronautics, Leonid Breitfuß, Walther Bruns' project



Leonid L. Breitfus / Ludwig Gottlieb Breitfuß
(1864–1950), Russian–German zoologist
and hydrographer, Arctic explorer.

On the right is an envelope with a letter addressed to Breitfuß from the International Commission for Scientific Aeronautics (Strasbourg), 1907. Photo from D. Pankratov's personal archive

Peninsula, which was named Emperor Nicholas II Land. The Academy of Sciences drafted a plan for exploring it and established a Permanent Polar Commission. But the plan was thwarted by World War I. The military operations demanded all the airships, leaving neither vehicles nor resources to explore the newly discovered land.

The struggle entanglement of circumstances in the second decade of the 20th century also determined the history of our Arctic studies. The key participants found themselves in a very difficult situation. In 1917, the Bolsheviks took over the rule in Russia and the Civil War



began. Furthermore, some of the most active members of the Polar Commission emigrated from Russia. When Germany suffered defeat in World War I, it was prohibited from building airships, including large dirigibles, to prevent it from developing a naval air force. In 1919, German pilot Walther Bruns, a former captain of a dirigible, came up with the idea of putting airships to commercial use. He suggested flying by dirigible from Europe to Japan and the United States across the Arctic, a route that would have markedly reduced travel time.

Berlin hydrographer Leonid (Ludwig Gottlieb) Breitfuß, who had emigrated from Russia, supported the idea and made an important addendum to it, i.e., a reconnaissance route laid out in such a way that it passed over Emperor Nicholas II Land. Breitfuß was one of the most active members of the Polar Commission and a patriot of the North. He had spent several years in Murmansk and sincerely strove for the prosperity of Siberia and longed for the opportunity to ultimately explore the archipelago discovered back in 1913.

It was this project – an expanded version of it – that laid the cornerstone for establishing in 1924 the International Society for the Exploration of the Arctic Regions by Means of the Airship (i.e., the Aeroarctic Society). Nansen himself agreed to serve as the society's chairman. The Soviet government was invited to review the project, so the latter was submitted for consideration to the Polar Commission of the Academy of Sciences.

Arctic project by Walther Bruns

The project, which was submitted in 1924 on behalf of Bruns, has survived in the Polar Commission's archival records at St. Petersburg Branch of the RAS Archives (SPB RASA). "Project by Walther Bruns" – these words, handwritten in pencil, stand on the cover of a blue folder that contains a typewritten Russian text, consisting of three parts.

The first part, "I. Introduction. Prepared by L. Breitfuß, member of the German Commission for Polar Research by Means of the Airship," includes historical background on the explorers and exploration efforts related to the Arctic coast and information on Zeppelin flights (SPB RASA. Archive Ref.: Coll. 75 / Inv. 1 / Doc. 95 / Pg. 7–11). The second part, "II. Report of the Commission for Polar Research by Means of the Airship (Zeppelin)," describes the history of the issue and provides evidence on the weather, navigation, expedition route, airship design as well as information on scientific objectives (*Ibid.*, Pg. 11 rev.–19). The third one, "Memorandum on the Expansion of the Hydrometeorological Service in the North of Russia and Siberia by Means of the Airship (Zeppelin).

Prepared by Captain Walther Bruns
and Dr. Karl Schneider" (*Ibid.*, Pg. 18
rev.-23).

This document has never been published and remains little known, so I cannot help but provide several extensive quotes.

Pg. 7-8. "If we glance at the globe, we see that Russia is one of the world's most polar countries: its main façade, washed by the waters of the Arctic Ocean, faces directly north, and one hundred and sixty degrees of the Arctic Circle pass entirely through its territory, from where the world's greatest rivers carry their warm waters to the Arctic Ocean. This apparently predetermines the dependence of northern Russia's inland regions, rich in natural resources, on the Arctic Ocean. Only by conquering the latter, i.e., by comprehending its fundamental aspects, one can achieve successful and inexpensive supply of these riches to the basins of the Atlantic and Pacific Oceans... Airships and airplanes are hindered neither by open seas nor polar ice nor marshy swamps; it is only high mountain ranges that can become an obstacle for them. Therefore, airships can plot their courses along great-circle lines, i.e., along the shortest distances between two points, and the northern polar regions... become the feasible closest route between West and East, between Europe and the countries beyond the Bering Strait. Indeed, the distance between Hamburg and Nome (Alaska) across the pole along the 10th and 170th meridians is only 65 degrees, i.e., about 3900 miles, or 7223 kilometers, and could be easily covered by a modern zeppelin in 60 hours. But the polar



Demonstration of aeronautics achievements. Figure from the magazine *Samolet*, N 11(25), 1925. *Main Collection, RAS Library, St. Petersburg*

regions are important for Russia not only because of the shortest distance between West and East; Russia values its proximity to the high Arctic regions also because the borderline regions of the Siberian continent and the vast oceanic glacial desert host centers of atmospheric disturbances, which define weather on a substantial part of European Russia as well as the conditions of ice distribution and fog formation along the sea route connections with Siberia.”

Pg. 10–11. “...Captain Bruns’ project, as presented below, relies on the latest achievements of aeronautics and thus should bring enormous progress to all branches of both special polar research and technical equipment in hard-to-reach polar regions since it will provide full capability to easily and quickly overcome huge, inaccessible areas; carry out all kinds of research; deliver, to any location, both people and cargo, such as radio and geophysical stations with full equipment and substantial life supplies; and, finally, rescue people and valuable cargo from wrecked ships, etc.

“...For the rational use of the forest, fish, fur, and mineral resources of North Siberia and proper development of sea and river shipping along with a hydrometeorological network, it will also be necessary to build a more extensive network of cultural and administrative centers throughout the vast Siberian taiga, which could lead to the appearance of nearby settlements of future *Kulturtäger*... Another, more extensive application of Bruns’ project should result in a grand undertaking with global implications and revive the ice-bound polar desert, opening up trans-Arctic traffic between Europe and the cultural centers on the northern shores of the Pacific Ocean (see the attached map).”

Weather, navigation, and expedition route

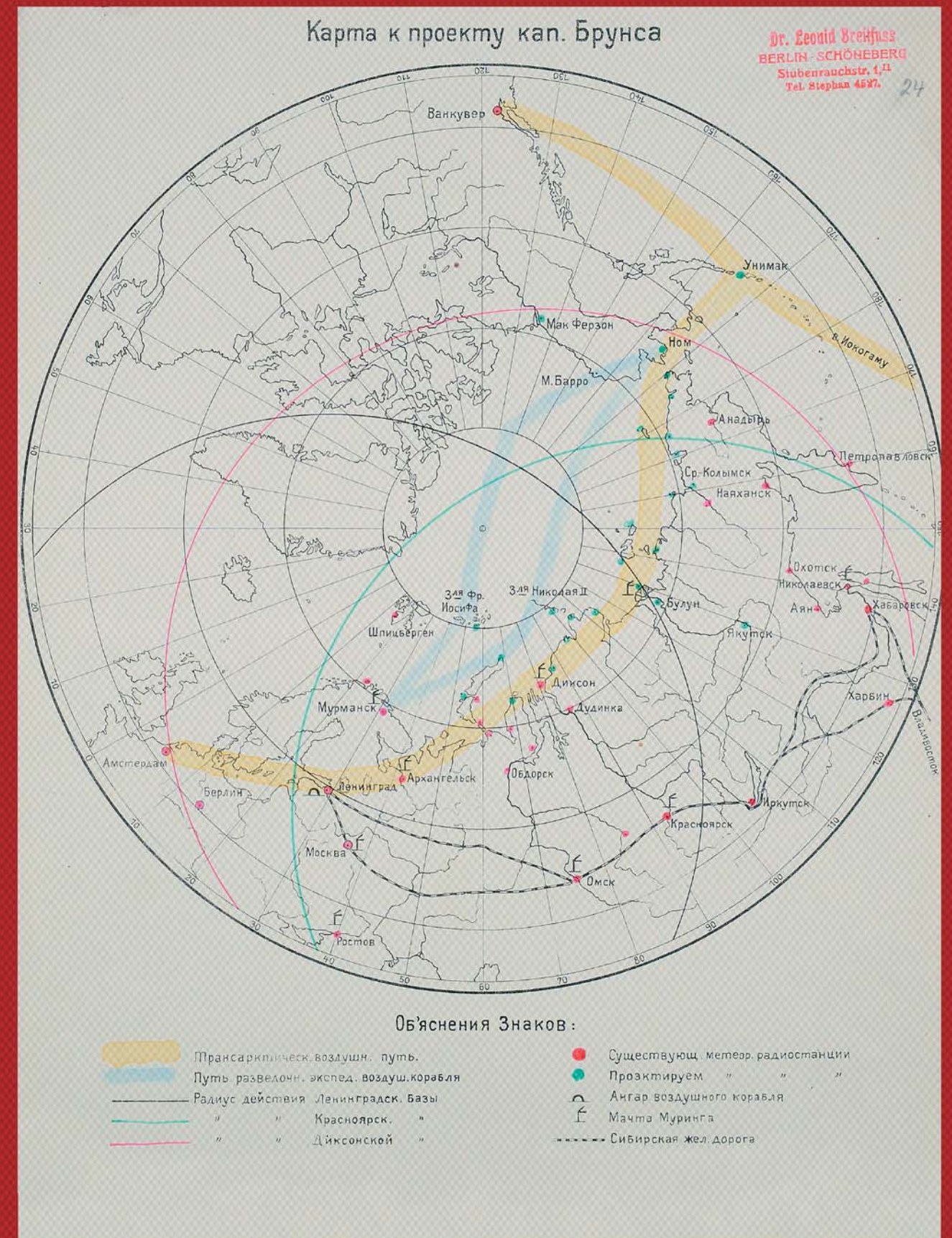
Pg. 12 rev.—13. “...According to the latest observations... in layers included in calculations for anticipated flights (up to 1000 meters altitude), temperatures are expected to be just slightly lower than those normally encountered during air flights in temperate latitudes... At this time, storms in the polar region are extremely rare; clouds and fogs are not yet significant; and precipitation reaches an appreciable level in exceptional cases only. Greenland, the Barents Sea, and the Kara Sea are meteorologically unfavorable. Fortunately, these areas are illuminated by several permanent meteorological stations, which are expected to increase in number in the near future. This allows the airship commander to find out the weather conditions in these areas in advance. This circumstance prompted the commission to choose the city of Murmansk on Kola Bay as the starting point of air navigation.”

Pg. 13-13 rev. "All the main instruments for staying on course in the polar region are unreliable (O.K.: magnetic compass, gyroscope, etc.). In contrast, given clear skies and visible sun, a rationally designed solar compass should prove an excellent navigational aid, with the added advantage of allowing the airship to navigate a great circle... The primary means of determining position must be radio direction finding."

Pg. 13 rev. – 14 rev. “The choice of flight route is determined by three circumstances: 1) favorable meteorological conditions; 2) the possibility of conducting scientific observations and solving geographical problems, primarily in as-yet-unexplored areas; and 3) in the event of an accident, the possibility of reaching land from any point along the route by one’s own means, even in a significantly damaged airship... Thus, the flight route is chosen in such a way that it passes nowhere more than 800 kilometers away from the shore. For such an eventuality, the ship’s crew has polar equipment and provisions for 64 days. During this time, one can expect to reach an inhabited place.

"Given these circumstances, the following flight route is proposed. The starting point should be the port of Murmansk as the northernmost one of the ports connected by rail, which can be reached in a single day by a modern airship. No hangar is required here; only additional gasoline and oil reserves are needed. From here, the direction of the first flight leg should be chosen depending on the prevailing meteorological conditions (see the attached map). Most likely, the flight will proceed via Spitsbergen or Franz Josef Land to the pole. From there, over an unexplored area to the American archipelago, to Point Barro, and onward to Nome in Alaska, deemed as a turning and stopping point. After receiving here operational materials, the return flight will immediately begin via the Bering Strait and then over an unknown region to Nicholas II Land. The subsequent course must be adjusted depending on meteorological data received via radiotelegraph in Murmansk. Under favorable circumstances, the course may be plotted in accordance with geographical research interests towards Cape Zhelaniya on Novaya Zemlya and thence to Murmansk. Under certain exceptional meteorological conditions, the course may be reversed upon leaving Murmansk, i. e., first to Nicholas II Land, then to Wrangel Island, etc. and, upon return, via the North American islands, North Pole, etc."

Handwritten route map attached to Captain Bruns' project. 1924. In the upper right corner is Breitfuß' personal stamp. *SPB RASA. Archive Ref.: Coll. 75 / Inv. 1 / Doc. 95 / Pg. 240. St. Petersburg*





All of Murmansk of the 1930s fitted into one photograph.
Source: http://murmansk-nordika.blogspot.ru/2012/10/blog-post_15.html

Airship design and scientific objectives

Pg. 14 rev. – 15 rev. “The airship design must satisfy in every detail the requirements specified by the Arctic situation, chosen flight route, and scientific objectives... The designed airship should have a volume of 150,000 cubic meters and be filled with helium. Given a total lifting force of almost 155,000 kilograms, such a ship will be able to take on board a crew and scientific staff of 50 people; provisions for 64 days; emergency equipment such as tents, kayaks, and sleds; 65,000 kilograms of fuel required for 100 hours of full speed; and, finally, the necessary spare ballast. A machine consisting of several individual motors, totaling approximately 3000 PS, will be capable of giving such a vehicle a maximum speed of about 120 kilometers per hour... At Nome, the turning point, the airship will have to take on additional fuel supplies.”

Pg. 15 rev.–18. “...The airship, even if it just flies without making any landings, can yield significant scientific results. Above all, it can answer the most fundamental geographical question regarding the distribution of land and water...”

Ten years ago, northwest of Cape Chelyuskin, explorers discovered Nicholas II Land, whose coastline has been traced for only 250 kilometers from the sea. Here, a serious question arises: Does this land consist of a single large island or is it essentially an archipelago? Where does its western border lie?

“Along the entire flight route, it will be possible to identify the distribution boundaries between open sea and ice, features of the latter, and location of driftwood. Processing this data will enable conclusions regarding surface currents in the Polar Ocean. Important observations will also be collected on the morphology and glaciology of new lands, with photography and cinematography being highly beneficial. Naturally, it will be convenient to make meteorological and atmospheric electricity observations throughout the flight... The results of this first flight should be supplemented by similar new expeditions as well as excursions to certain regions. The outcomes of these flights will ultimately prove decisive for Captain Bruns’

project of trans-Arctic air flights from Amsterdam via Copenhagen, St. Petersburg, Arkhangelsk, Nome, and Unimak (in the Aleutian Islands) to Yokohama, or even Vancouver and San Francisco...

“Bruns’ plan for the future trans-Arctic enterprise envisages six airships with a capacity of 150,000 cubic meters, each capable of carrying 100 passengers and 10,000 kilograms of mail... The cost of travel from Yokohama will only increase by 50% compared to first-class travel by a passenger steamship whereas the destination will be reached five times faster.

“Thus, both science and the global economy are equally interested in the implementation and functioning of trans-Arctic air routes.”

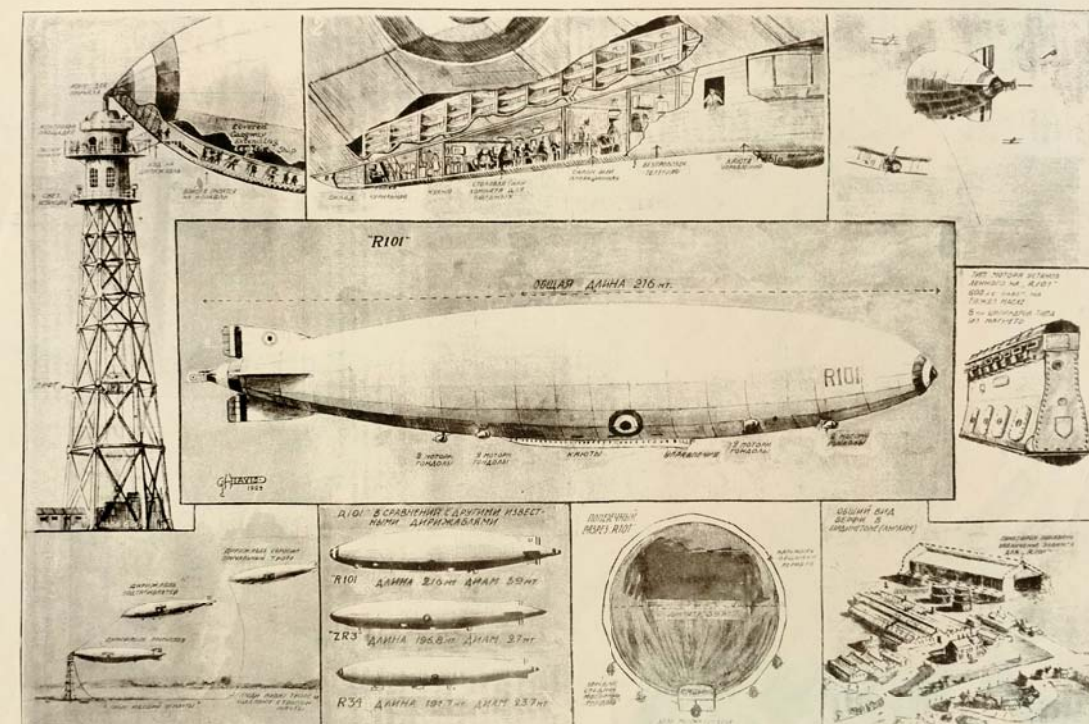
Siberian notification and messaging network

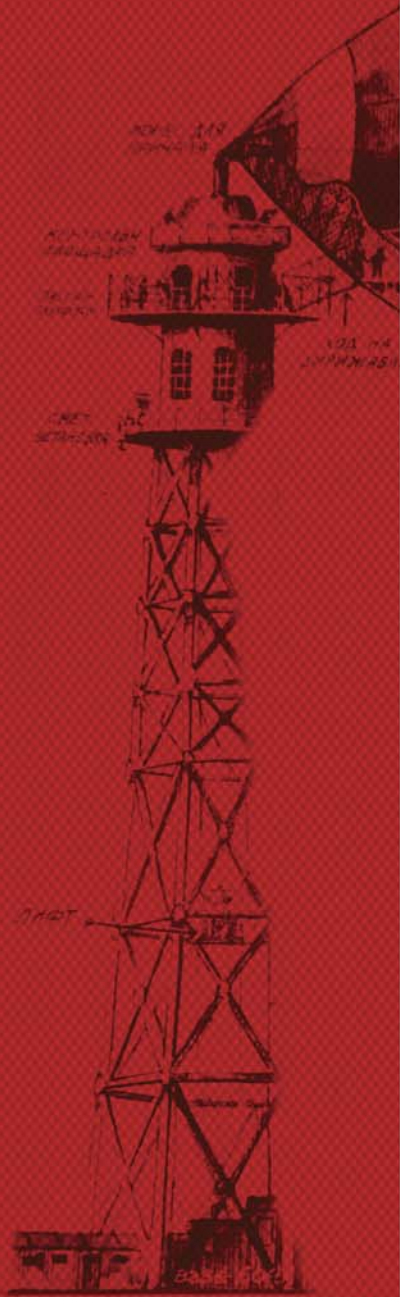
Pg. 18 rev.–23. “Many decades ago, when building a meteorological network in Russia and North Siberia, great importance was attached to stations located as far north as possible, e.g., in Obdorsk, Turukhansk, and Verkhoyansk... Stations not located on rivers or coastal islands of the Arctic Ocean find themselves in a less favorable position. Only recently, the introduction of radio telegraphy enabled the timely use of observations from these stations.

“Today... science recognizes the urgent need to monitor the polar periphery using a well-developed network of meteorological stations. Russia, as the country most committed to this, has organized a modern hydrometeorological service on a grand scale using radio telegraphy.

“Hydrometeorological stations, however, are crucial not only for synoptic meteorology but also for the immediate needs of the North itself, where navigation requires, above all, hydrological information. This work has advanced substantially in the western part of the route through the construction of the Kara radio stations and initiation of meteorological observations at these stations. Thus, we now have radio stations at Matochkin Shar, the Kara Gate, Yugorsky Shar, Mare-Sale, Dikson Island, and Dudinka; the hydrometeorological service at these stations is of paramount importance. Of course, to fully cover all the hydrometeorological processes servicing navigation along the western part of the Siberian Sea Route, one needs a wider network of stations: on Franz Josef Land, in the north of Novaya Zemlya, beyond the western side of Matochkin Shar, at Cape Chelyuskin, on Nicholas II Land...”

Design and main characteristics of an airship.
Figure from the magazine *Samolet*, N 1(15), 1925.
Main Collection, Library of the Russian Academy of Sciences, St. Petersburg





Airship mooring mast.
Figure from the magazine
Samolet, N 1(15), 1925.
Main Collection, RAS Library,
St. Petersburg

* Dr. L. Breitfuss. Zur Frage über sibirischen Seeweg nach Osten, "Peterm. Geogr. Mitteilungen", 1904. Heft 12.

"This memorandum, with regard to further development of the Russian network of hydrometeorological stations, relies primarily on the proposal of polar explorer Dr. L. L. Breitfus,* expressed in his report to St. Petersburg Shipping Society on April 14 (27), 1904, and accepted by a special commission...

"The proposed extensive network of stations, as shown on the attached map, can be equipped and maintained only with the availability of airships. Inspection trips to stations, as well as journeys in especially urgent cases, will require no more hours from the airship than months needed for an expedition aboard a seagoing vessel.

"...Our project envisages one or two airships with a hard shell of approximately 100,000 cubic meters in volume. The length of such a ship is approximately 245 meters. The height is 40 meters. Naturally, it is impossible to shelter such a massive hull in a hangar in polar regions. In America, modern technology has developed for secure airship mooring the so-called *mooring mast*, erected on land or on a ship made of iron. The cost of constructing these masts is modest; a network of masts, spaced 1000 kilometers apart, would ensure, one could say, almost complete safety of air navigation in a given region...

"The attached map shows with 3000-kilometer radii the operational areas of an airship based in Leningrad, Krasnoyarsk, and Dikson. The flight time from the base to the outskirts is 1 ½ days. Thus, a 100,000-cubic-meter airship is capable of flying, without any support stations, from Leningrad to Bulun at the mouth of the Lena River and back in three days, carrying, in addition to passengers, 10,000–15,000 kilograms of cargo. To avoid transporting cargo over such long distances, it is necessary to erect a mooring mast at the Dikson station and deliver there all necessary supplies by sea and river... The Dikson station's operational radius covers a vast area and could be used for other missions as well. Finally, the base in Krasnoyarsk would allow one to cover almost all of Asia.

"Not a single country in the world offers so favorable conditions for the use of airships as Russia and Siberia, especially in the regions north of the Siberian Railway, where the construction of a meteorological network lays a foundation for the economic and cultural conquest of this remote area. Agriculture, shipping, and the ensuing extractive and processing industries stand to gain significantly from the project. Demarcation and photometric surveys from airships will ensure their operation here for decades to come.

"The existence of flourishing cities along the Siberian Railway and the growing importance of the mouths of the Ob, Yenisei, and Lena rivers eloquently demonstrate that the time has come to begin constructing a notification and messaging network in Siberia. Let us hope that by implementing our proposed plan, Russia and its government will resolve the century-old Siberian problem commensurate with its high cultural, political, and economic significance. Berlin, August 1, 1924."

Resolve the "century-old Siberian problem"

Most likely, the entire text of this document, with the possible exception of the navigation and airship design details, was composed and written by Breitfuß himself. We have cited it so extensively for a reason – a simple retelling would not truly capture the profound interest in the development of Russia (then Soviet Russia) expressed in the thoughts and proposals of the scientist, who at that time lived in Germany. Although Breitfuß' personal signature appears only beneath the foreword, his involvement in the scientific part of the project, or even his authorship, is evident from the document's contents and from the

beiten von den Schiffen aus an drei Punkten gleichzeitig in Angriff genommen werden: von der Dickson-Bai aus nach O, vom Kap Deschnew aus nach W, von der Lenamündung aus nach W und O (bis zum Kap Tscheljuskin und den Neusibirischen Inseln), wobei es als nützlich erachtet wird, für jede dieser drei Untersuchungen je zwei Schiffe auszurüsten, um Unterbrechungen der Arbeit infolge Havarie des einen Schiffes vorzubeugen.

Jede Station ist auszurüsten mit meteorologischen Instrumenten für Stationen zweiter Ordnung (etwa 400 Rubel), mit magnetischen (1000), hydrologischen (250) und hydrographischen (2500) Instrumenten. Das macht im ganzen durchschnittlich für jede Station 4000, für alle 16 Stationen also 64 000 Rubel.

Für Errichtung und Unterhaltung der Station wurden je 4000, in Summa 64 000 Rubel in Anschlag gebracht.



Sibirische Beobachtungsstationen nach dem Vorschlag von Dr. L. Breitfuß.

Für 16 Boote à 300 = 4800 Rubel, für Waffen à 500 = 8000 Rubel, für Unterhaltung des Personals einschließlich Beköstigung 3600 Rubel für die vier Arbeiter, 1800 für den Feldscher, 2600 für den Meteorologen und 4000 für den Astronomen, zusammen jährlich für jede Station 12 000, für alle 16 für drei Jahre 576 000 Rubel.

Reise-, Equipierungs- und Wohnungswechselspeisen dem Personal jeder Station 3500, für alle 56 000 Rubel.

Sechs voll ausgerüstete Expeditionsschiffe à 200 000, in Summa 1 200 000 Rubel.

den Apparaten (Thermographen, Barographen, Hydrographen) zu versehen und eine der magnetischen Stationen (in der Lenamündung) mit Variationsapparaten auszustatten.

Dann traten einige Mitglieder der Expedition der Meinung Warneks bei, der die Ansicht aussprach, daß, wenn auch der Holztypus für die Expeditionsschiffe gewählt wird, doch eine Unterstützung der Expeditionsschiffe durch einen Eisbrecher vom Typus des »Jermak« sehr erwünscht wäre.

Bezüglich des Beginns der Expeditionsarbeiten vertrat

Article by Breitfuß,* dedicated to the question of a sea route to Siberia, contains a map with the proposed locations of observation stations in Siberia.

*Breitfuß L. Zur Frage über den sibirischen Seeweg nach Osten // Dr. A. Petermanns Mitteilungen aus Justus Perthes' Geographischer Anstalt. 50. Band. Gonha: J. Perthes, 1904. P. 285–290. Cartography Sector, RAS Library, St. Petersburg

passages emphasized. These include, first and foremost, the role of rescue stations; the geographical conditions of northern Russia; the necessity of flying over Emperor Nicholas II Land; and even the fact that Murmansk, rather than Arkhangelsk, was chosen as the site for the airship mooring mast.

Breitfuß lived and worked for many years in the Murman area, first as an assistant (1898–1902) and then as the head (1902–1908) of the Murmansk Scientific and Fishing Expedition. He also served as the Murmansk Rescue Stations Commissioner for the Water Rescue Society in 1902–1910. As one of the most active members of the first Polar Commission, Breitfuß, together with Innokenty P. Tolmachoff, worked as early as 1916 to secure the adoption of a law on maritime safety; he also published several works on the deployment of rescue stations throughout northern Russia. As early as 1914, he proposed using airplanes for geographical exploration and the search for expeditions lost in the Russian North; on his initiative, that same year, the Maurice Farman seaplane was first used to search for Georgy Ya. Sedov's expedition.

Zur Frage über den sibirischen Seeweg nach Osten.

schnitt. Sie scheint am kleinsten im Dezember und April zu sein und hat zwischendurch eine merkliche Zunahme. In dieser Zeit, d. h. im Hochwinter, ist die Zahl der Hagelstürme am größten, und am kleinsten im Hochsommer, entsprechend der geringen Luftfeuchtigkeit, sowie der

hohen Lufttemperatur, die etwaige Hagelbildungen schon im Beginn aufheben würde. Schnee fällt sehr reichlich, so daß in einzelnen Wintern hochgelegene Ortschaften tagelang von jeitem Vorsteh abgedeckt sind (vgl. Meteorologische Zeitschrift 1894, S. 191).

Zur Frage über den sibirischen Seeweg nach Osten.

Von Dr. L. Breitfuß.

Die ersten Versuche zur Auffindung der »Nordpassage« wurden von Holländern und Engländern im 16. Jahrhundert unternommen. Sie hatten die Auffindung des nächsten Weges nach Indien zum Zwecke; da diese Reisen aber bloß auf Vermutungen basierten, hatten sie keinen Erfolg. Erst in der Mitte des 17. Jahrhunderts (1648), seit der Entdeckung der Meerengen zwischen Asien und Amerika durch den Kosaken Seemann Deschnew, trat die Frage in ein neues Stadium, und schon unter Anna Iwanowna (1733–44) wurde die »Große Nordische Expedition« unter Führung Berings ausgerüstet. Sie begann so ziemlich gleichzeitig von fünf verschiedenen Punkten, und zwar:

1. Von Archangel aus gingen Murawjew und Pawlow, welche später durch Malygin und Skuratow ersetzt wurden, nach dem Ob.
2. Von der Olanfunde aus gingen Golowin und Orwin, später abgelöst durch Minin und Koschelew, nach W und O.
3. Aus dem Jenissei gingen 1738 nach O Minin und Sterlegow.
4. Aus der Lena gingen nach W 1735, 1736 Pronstschischew, nachher Ch. Laptjew mit Tscheljuskin und Tschekin, nach O Lastin und D. Laplew.
5. In den Stillen Ozean waren Bering und Tschirikow mit der Auffindung von Amerika betraut, Spangberg ging nach S, nach Japan.

Jede der Expeditionen verfügte über 2–3 Schiffe mit großem Proviantvorrat, außerdem waren an verschiedenen Küstenplätzen Proviantmagazine errichtet worden. Mit Ausnahme der Küsten des Karischen Meeres basieren heute noch unsere Karten auf den vor 160 Jahren von der wahrhaft geistigen Expedition gewonnenen Daten.

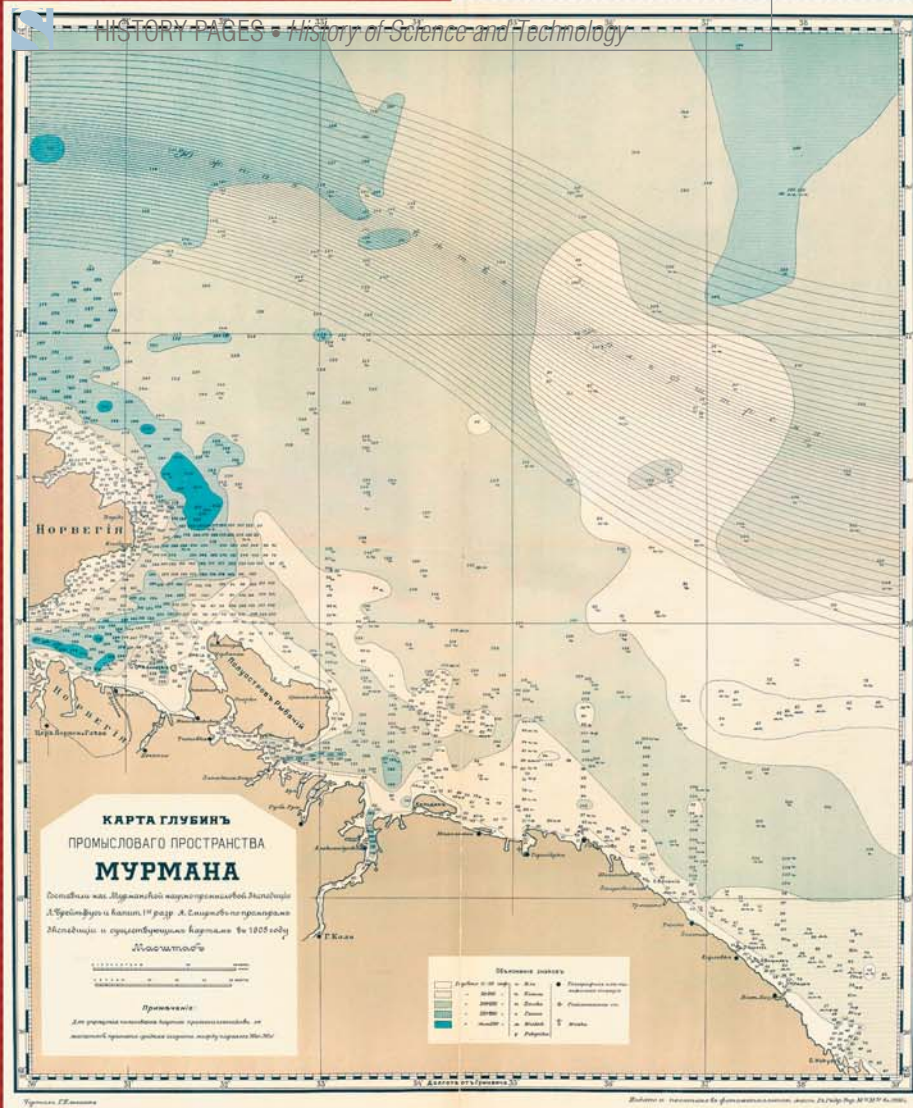
Bald darauf wurde auf Initiative Lomonossows die Tschitschagowsche Polarexpedition ausgerüstet, die aber keinen großen Erfolg hatte. Außerdem muß noch der Arbeiten des Kpt. Billings im Jahre 1791 zwischen der Tschumskibucht und dem Tschukotski-Kap oder Kap Deschnew an der Beringstraße gedacht werden.

Die Art der mehr praktischen Untersuchungen in dieser Richtung begann erst im Jahre 1821, als Leutn. Lütke die Untersuchungen der Küsten von Nowaja Semlja und deren Meerengen aufnahm, während der Steuermann Iwanow

im Bogen zwischen der Petschors und dem Ob arbeitete. Diese Arbeiten wurden in den folgenden Jahren durch die Marineoffiziere Pachtassow und Ziwoika erfolgreich fortgesetzt. Gleichzeitig (1821–23) arbeiteten der Leutn. Anjon und der Steuermann Borschow im Uferzonen der Flüsse Olenek und Indigirka, wobei die Neusibirischen oder die Anjous-Inseln in die Karten eingetragen wurden. Der Steuermann Kosmin beschrieb die Küste zwischen der Indigirka und Kolyma, Leutn. Wrangel und Midshipman Matschitschkin die von der Kolyma bis zur Beresordok- oder Koljitschinkai-Bai und Kpt. Schischmarow die Küste vom Kap Deschnew bis Kap Seerdz-Kanjen. Auch durch diese Arbeiten wurde die Frage über die Möglichkeit der Nordostpassage nicht entschieden und, was getan war, hatte nur Bedeutung für die Frage des Eintritts ins Karische Meer.

Erst Ende der 50er Jahre regte Seidorow die Frage des Seeweges nach Sibirien energisch an und veranlaßte die russische Regierung, die Expedition Kruzenschners 1860 und 1862 nach N auszusenden. In späterer Zeit fallen die Reisen von Seidorow, Suhrjakow und dem Engländer Wiggins zum Jenissei, wobei kaufmännische Zwecke verfolgt wurden, und v. Norienskißs berühmte Umsegelung Asiens.

Das Expeditionsschiff Nordenskiöld »Vega« lief in Begleitung der Dampfer »Expedi« und »Fraser« am 21. Juni 1878 aus Tromsø aus und gelangte Ende Juli in Port Dickson an der Mündung des Jenisseibogens an, nachdem es durch die Jüngerstraße ins Karische Meer gelangt war. Von hier aus liefen »Fraser« und »Expedi« in den Jenisseibogen ein, während »Vega« und »Lena« weiter nach O gingen. Am 19. August wurde glücklich das Kap Tscheljuskin (77° 37' N.) umschifft und am 27. August, wenigstens von Zeit zu Zeit durch Eis aufgehalten, die Mündung der Lena erreicht, in welche die »Lena« einlief und bis Jakutsk hinaufging. Am 12. September traf die »Vega« beim Kap Seewery (180° v. Gr.) auf schwere Eisschranken, mit denen sie bis zum 18. September zu kämpfen hatte, ohne viel vorwärts zu kommen. Im leichten Eise weiter dampfend, mußte das Schiff am 20. September wieder still stehen, um Lotungen vorzunehmen, da sich sehr geringe Tiefen bemerkbar machten. Tiefen von 2–4 m waren keine Seltenheiten; am Kap Seewery hatte das Schiff unter dem Kiele nicht ganz 1 m, das



Depth map of the Murman fishing area, compiled by Breitfuß, head of the Murmansk Scientific and Fishing Expedition, and Captain A. P. Smirnov in 1905.
Adapted from: kolamap.ru

Above: Title page of Breitfuß' paper "Northern polar expeditions of 1912 and subsequent search and rescue missions"

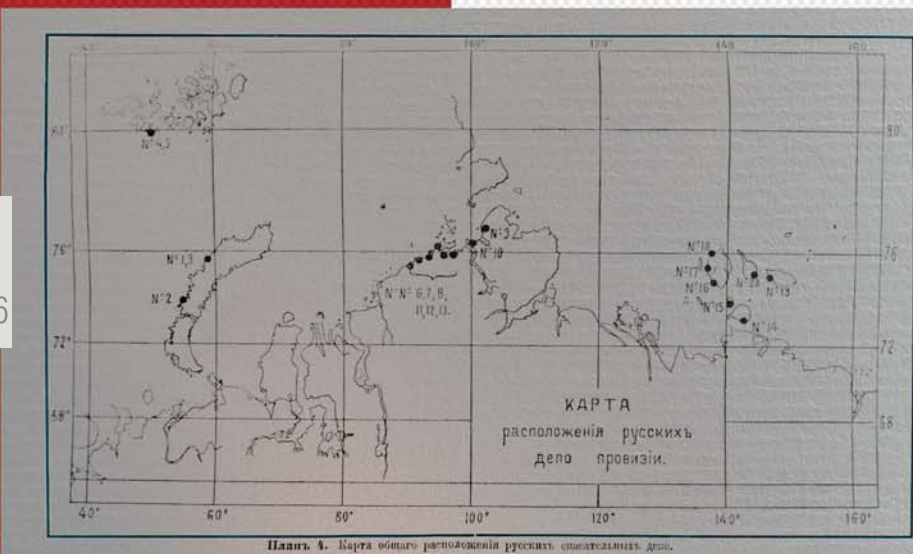


Landing of the SL I airship in Brühl, Germany. 1912.
Source: www.rohrhof.eu

Participants of the 1906 Murmansk Scientific and Fishing Expedition. Breitfuß is the second one from the left in the bottom row. *Proceedings of the 1906 Murmansk Scientific and Fishing Expedition: Report of the Expedition Leader L. L. Breitfus.* RAS Library, St. Petersburg

In his project, Breitfuß discusses in great detail the construction of a network of stations for meteorological and other observations as well as the economic and cultural development of Siberia. Thus, his entire scientific biography becomes the foundation for a project that, as he envisions it, would completely transform life in Siberia, make the cities along the Siberian Railway flourish, and resolve "the century-old Siberian problem commensurate with its high cultural, political, and economic significance."

An explorer of Russia's European North and an active member of the Polar Commission, Breitfuß was undoubtedly eager to help actualize the goal of surveying Emperor Nicholas II Land, which had prompted the establishment of the commission. Seeing such an opportunity in Bruns' project, he apparently revised it to maximize the benefits for the Russian North. The extraordinary swiftness with which the project, with a new flight map attached, found itself in Soviet Russia under government scrutiny indicates that the document was most likely prepared in advance. At the October 1924 meeting where the Aeroarctic Society was established, this project was considered as the primary one. In other words, the Aeroarctic Society itself emerged as part of Bruns' project, which in reality became the Breitfuß–Bruns project, one of its primary goals being the survey of Emperor Nicholas II Land. This is further confirmed by the fact that a large part of the text was later published by Breitfuß in his short monograph dedicated to the Arctic.



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The journal *Zapiski po gidrografii* ('Notes on Hydrography', Vol. 41, N 2–3, 1917) published an article by Breitfuß about food depots set up by Russian expeditions on the shores of the Arctic Ocean. The article included a map titled "Map of the Locations of Russian Provision Depots." RAS Library, St. Petersburg



Fridtjof Nansen, the famous Arctic explorer from Norway, 1888. Photographer: L. Szacinski de Ravics. Public domain

"The Airship in Worldwide Communications"

What remained of Bruns' project in the one presented by Breitfuß? Only a small part, i.e., that the reconnaissance flight would serve as the basis for trans-Arctic flights and the calculations for the dirigible's technical components.

For comparison, we can refer to Captain Bruns' report to the Danish Aeronautical Society in Copenhagen on December 4, 1924, which marked the beginning of our story (see *SCIENCE First Hand*, 2016. N 3(45)). This text was appended to the main project and prefaced by the following statement: "In addition to the Memorandum on Captain Bruns' project, already known to you, I submit the following report. Berlin, January 12, 1925. L. Breitfuß." In his report, Bruns focused on the economic aspects of the project, providing technical details of the airship design and filling, information about mooring masts and airship hangars, and the expected benefits of its usage. The report itself was titled "The Airship in Worldwide Communications."

Bruns concluded his report by saying that it would be immodest of him to criticize the various air routes currently used to plan air connections. But he still wished to outline a project which he had been working on for several years and for which the Arctic expedition being

planned by him jointly with Prof. Nansen had to be a trial run only. Bruns raised the question: Why was polar exploration of such great interest for air navigation? His answer was that air navigation via polar countries from Europe to the Pacific Ocean would find there the most favorable meteorological, technical, and economic air-flight conditions. For any other means of communication, the Arctic presented truly insurmountable obstacles. Although here, too, one should not expect that the line would go along a great circle.

Then, Bruns suggested taking Amsterdam as a starting point and Yokohama, or Vancouver and San Francisco, as a final destination point and then trying to connect them by air. One would see that the most efficient route was via Copenhagen, Leningrad, Arkhangelsk, the mouths of the Ob and Lena rivers, the Bering Strait, and the Aleutian Islands (Unimak). There, the routes had to diverge, with one line going via Petropavlovsk to Yokohama and the other to Vancouver and San Francisco. Bruns was sure that this 13,000–14,000-km route could be covered by mail and passenger traffic in 6–7 days. With usual first-class service, the journey from Europe to Yokohama took about 35 days... This project should have had enormous international economic value because it would, in many cases, have cut travel time to about one-fifth...

Bruns expressed confidence that one of the great cultural powers would assist Prof. Nansen and him in constructing such an airship. Without any risk, it would thereby fulfill one of the greatest cultural goals of the entire Northern Hemisphere and, with the help of this same airship, would be the first to reap the fruits of new air travel.

Support denied

Breitfuß was, by all accounts, confident of the success of his proposal. With little doubt of a positive outcome, he focused on describing how North Siberia would flourish with the use of airships as a means of transport: one could deliver any cargo and carry on construction works; the region would finally thrive...

He indeed had grounds to feel confident. The project was signed by a commission consisting of leading German experts. The scientific side of the project was supported by Nansen and the technical one by engineer Johann Schütte, a renowned airship designer and chairman of the German Aeronautical Society. Preliminary reports on the project were held in Copenhagen and Oslo. The project received favorable reviews in the Soviet press, which published expedition route maps, a project description, cost estimates, and a portrait of Bruns. Soviet journalists also noted that the airship, as a powerful technological achievement, would facilitate the colonization of the northern Siberian coast.

Erste Fahrt des Luftschiffes „SCHÜTTE LANZ.“



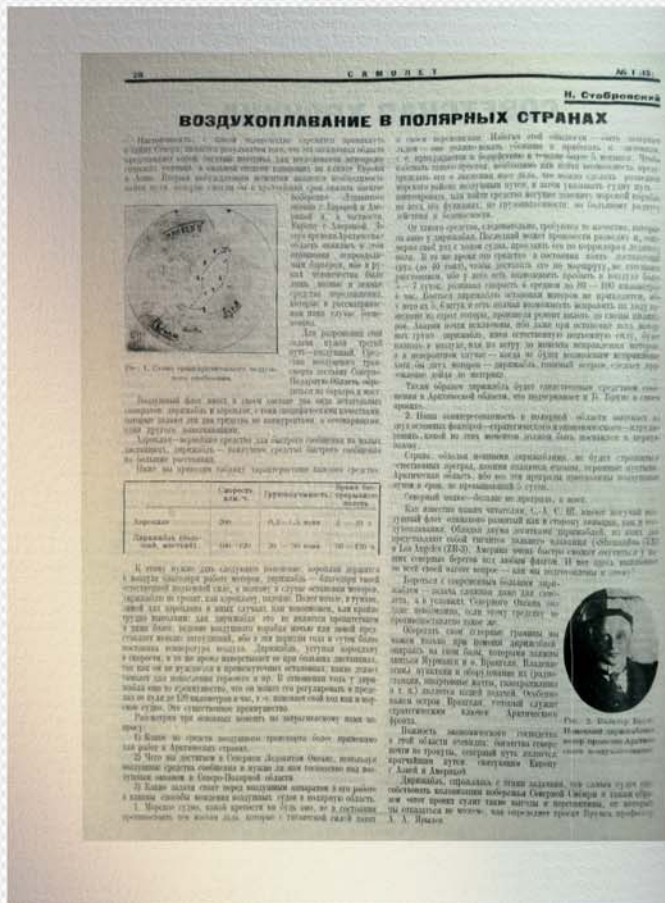
First flight of the *SL I* airship and a portrait of its inventor, Prof. Johann Schütte.
Source: <http://www.rohrhof.eu>

Official envelope of the Schütte-Lanz airship company, 1921.
Source: <http://www.rohrhof.eu>



The Polar Commission discussed the project at meetings on December 5 and 20, 1924, paying considerable attention not only to the scientific aspects but also to economic ones, as the project called for large immediate financial investments from Russia to support a network of stations along the airship's route. The commission concluded that, although the project was hardly feasible economically and poorly substantiated, it contained provisions that could facilitate the development of research in the Arctic. In addition to the Polar Commission, opinions on the Bruns–Breitfuß project were expressed by representatives of the USSR Hydrographic Department, Northern Scientific and Industrial Expedition, Higher Military Aeronautical School, Air and Terrestrial Magnetism Sections, Russian Engineering Society, etc. The project was also praised by the renowned Soviet polar explorer and oceanographer Vladimir Yu. Vize.

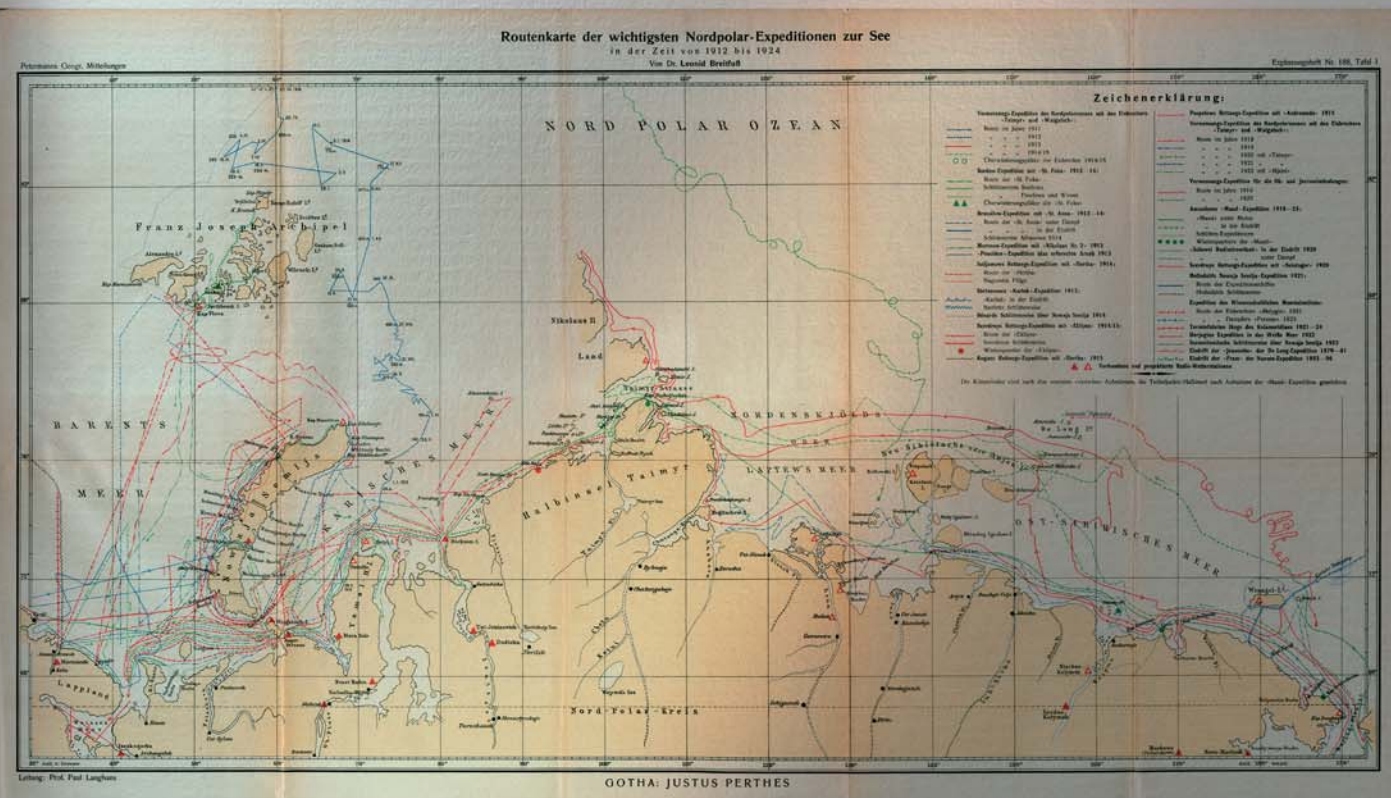
Nevertheless, despite favorable reviews of certain parts of the project, the Academy decided that the Soviet Union would not participate in its implementation, citing the insufficient development and extremely high cost of the project. Admittedly, these reasons for declining the project were quite compelling, but one cannot ignore the role played by the political situation. By 1924, Emperor Nicholas II Land, the very reason for setting up the Polar Commission, had remained neither explored nor mapped by Russian scientists. Therefore, Soviet Russia naturally did not want this to be done by foreign expeditions while the Soviet side would have remained merely a passive observer, having prepared rescue stations for the foreigners.



Article “Aeronautics in polar countries” by N. Stobrovsky featured a portrait of Walther Bruns with the comment: “German airship pilot. Author of Arctic aeronautics projects.” *Samolet Magazine*, No. 1 (15), 1925.

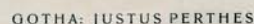
Left: The cover of the magazine *Germanskaya tekhnika* (‘German Technology’), 1925, N 4, which published Breitfuß’ article “By airship across the Arctic.” RAS Library, St. Petersburg

Although the Bruns–Breitfuß project did not gain support in the Soviet Union in 1924, Bruns came there again in July 1925 in yet another attempt to reach an agreement with the Soviet government regarding the airship expedition. He also travelled across the country to promote his idea and to find a site for a mooring mast – an event covered in the Soviet and international press at that time. Breitfuß, too, published several works, including in Germany, apparently, in support of Bruns’ efforts. Thus, his article “By airship across the Arctic” appeared in the



Route map of the main expeditions in the Arctic Ocean from 1912 to 1924, created by Breitfuß. Adapted from: Breitfuß L. (Hrsg.): *Internationale Studiengesellschaft zur Erforschung der Arktis mit dem Luftschiff (Aeroarctic). Verhandlungen der 1. Ordentlichen Versammlung in Berlin, 9.–13. November 1926*. Cartography Sector, RAS Library, St. Petersburg

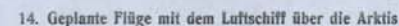
At this point, thing finally began to change. The project received official status and was accepted for consideration by the highest government agencies. The reason was simple – this time, Soviet Russia became a full member of the expedition and the International Society for the Exploration of the Arctic Regions by Means of the Airship. Soviet scientists were granted membership in the society, and the Soviet Union began creating its own Aeroarctic group.



Breitus L. L. (Breitfuß L.) Dannye o plavanii sudov spasatel'nykh ekspeditsii parokhodov "Andromeda" i "Kity" (Polyarnyi) v 1915 godu (Data on the voyages of the rescue expedition ships Andromeda and Kity (Polyarnyi) in 1915). Petrograd: Tip. Mor. Min. Glav. Admiralteistvo, 1916. (Reprint from Zap. Gidrograf., 1916. V. 40, N. 3) [in Russian].

*Breitfus L.L. (Breitfuß L.) Na
vozdušnom korable cherez Arktiku
(By airship across the Arctic) //*
Germanskaya tekhnika. 1925. N. 4
[in Russian].

Bruns W. *Das Luftschiff als Forschungsmittel der Arktis*. Hg. von der Internat. Studiengesell. zur Erforschung der Arktis mit dem Luftschiff. Berlin, 1925 [in German].



Maps from Breitfuß' work show the results of explorations in the Russian Eurasian Arctic region, including a map of the northern part of the Taimyr Peninsula and the eastern coast of Emperor Nicholas II Land (fragment 10, *left*) and a map depicting the planned trans-Arctic flight route (fragment 14, *right*). Adapted from: Breitfuß L. (Hrsg.): *Internationale Studiengesellschaft zur Erforschung der Arktis mit dem Luftschiff (Aeroarctic). Verhandlungen der 1. Ordentlichen Versammlung in Berlin, 9.–13. November 1926*. Cartography Sector, RAS Library, St. Petersburg