Renewing Museums. River Museums and their Publics – New Approaches

9th meeting of the European Network of River Museums

Conference proceedings,
13. – 15. May 2024, Bratislava

NATIONAL MARITIME MUSEUM
in Gdańsk

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Lenka Vargová (ed.)

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ENoRM

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Foreword – ENoRM conference, Bratislava May 2024

9th meeting of the European Network of River Museums took place in May 2024 in Bratislava, on the premises of the Slovak Technical Museum – Museum of Transport. At the previous meeting in Basel in 2023, the topic „Renewing Museums“ was chosen as the overall theme for this meeting. The participants were encouraged to present topics discussing opening museums for new groups of visitors, exploring new strategies to address the public, including new and innovative tools or interactive elements used in museum exhibitions, but also current problems of water transport museums. Thus, over the course of three days, the meeting participants heard 13 contributions focusing on river and ship museums, their history or special issues. As part of the social programme, there was first a guided tour through the exhibitions of the Museum of Transport, including the temporary exhibition „100 years of Danube shipping”. Afterwards there was a guided tour of the historical centre of Bratislava. On the second day, the organisers prepared a boat trip on the Danube, including the pools of Winter Harbour. On the last day of the meeting, we took a historic bus into the Winter Harbour, where we toured the national cultural monument tugboat Šturec and Zvolen, as well as high speed hydrofoil Meteor. „The conference was also carried out under the framework of a grant VEGA no.1/0698/22 “Czechoslovak cargo and passenger transport along the Danube River in the 1970s and 1980s”.

The lectures were started off by Jadwiga Klim (Narodowe Muzeum Morskie w Gdansku), who reminisced on the past 10 years of ENoRM. Then we heard about the history of the construction of The Wiener Neustadt Canal from Wolfgang Stritzinger (Technisches Museum Wien). Next, Michal Plavec (National Technical Museum, Prague) presented a topic focused on the Battle of the Danube during the Second World War. Then Markus Reich (Elbschifffahrtsmuseum, Lauenburg) continued with the introduction of the Paddle steamer KAISER WILHELM - museum steamship in original operation and Werner Hinsch told us about the News from the Elbe shipping archive.

We started the second day with Gordana Karović´s (Museum of Science & Technology, Belgrade) “From the invisible to the visible: historical shipwrecks” where she presented her new book on the topic which later went on to win ICOM Serbia Award for new publication. Jadwiga Klim then presented New projects on the Vistula River and in the National Maritime Museum in Gdańsk they are currently focusing on. After that we heard a very interesting concept of a new exhibition using container architecture by Arnulf Siebeneicker (LWL-Museum Schiffshebewerk Henrichenburg) - Current affairs in a history museum. The exhibition “Container. The global box“. Lenka Vargová (Comenius University Bratislava) presented preliminary results of her research into The use of interactive elements in ship / water transport museums. Ľuboš Kačírek (Slovak Technical Museum – Museum of Transport in Bratislava) talked about Efforts to establish a Museum of Water Transport in Bratislava. Martin Goduš and Michal Jajcaj (Slovak

Technical Museum – Museum of Transport in Bratislava) presented the Preparation of the Water Transport Museum Exhibition on the Šturec tugboat that should house the museum in the future. Martin Dubiny (Slovak University of Technology, Faculty of Architecture and Design) and Jiří Mandl also looked into the topic of the museum project by introducing the issues centred on the Management of the conversion of a national cultural monument in the example of Shipyard Hall in the port of Bratislava. We finished the lecture section of the conference with Dennis Beckmann´s (Museum der Deutschen Binnenschifffahrt, Duisburg) reflection on Museum shops, especially related to river / ship museums and how they can make their offer more relevant and interesting at the same time.

The third day of the conference was dedicated to discussions about previous panels, as well as the future direction of the ENoRM, possibilities for further cooperation between its members, issues of raising awareness about the network and its activities, and ways to support one another.

In this almanac, you can read 10 of the contributions from the conference. I hope you will find them interesting and educational, thus helping us spread the awareness about the topic of river museums, historical ships and their importance as part of universal cultural heritage.

On behalf of the organising team – Lenka Vargová
Bratislava, October 2024

European Network of River Museums 2014 – 2024

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Abstract:

In 2014, the first meeting of the European Network of River Museums took place in Gdańsk. It was an initiative of the director of the National Maritime Museum in Gdańsk, Ph.D. Jerzy Litwin. Network`s aim was to facilitate contacts between museums with a similar profile and expand the possibilities of joint activities. Since then, network meetings have been held regularly, except for the pandemic break. In the material, I describe the development of the network, the activities carried out and the group's achievements.

In 2013 director of the National Maritime Museum in Gdańsk, Ph.D. Jerzy Litwin took the initiative to organize the European Network of River Museums. Its aim was to facilitate contacts between museums with a similar profile and expand the possibilities of joint activities. This cooperation would help exchange good practices and could lead to joint work on exhibitions, scientific research or mutual assistance in supplementing the collection. The idea was picked up by Werner Hinsch from the Elbe Schipping Archive in Lauenburg, who enthusiastically contributed to its implementation.

In order to initiate cooperation, representatives of European river museums were invited to a meeting held on May 28, 2014 in Gdańsk. Representatives of 8 institutions from France, Germany, Serbia and Poland took part in it. Meeting participants presented their institutions and decided to continue cooperation. After the meeting, guests had the opportunity to listen to lectures and discussions of the 12th Conference of Polish Maritime and River Museums (May 29 – 30) and learn about museums and tourist attractions in Pomerania region.

The second meeting of the Network took place at the Elbe Shipping Museum in Lauenburg, Germany, on June 4 – 6, 2015. Representatives of 10 institutions from Germany, Serbia and Poland participated in it. In Lauenburg, a seminar formula began to develop, which in the following years was shaped as follows: presentation of the achievements of last year and plans for the future by museums constantly participating in the Network's meetings, presentation of "new" institutions that participated in a given meeting for the first time, historical lectures related to the place and river where the meeting took place and educational trip. Thanks to this formula, museum

representatives can get to know each other and their museums, keep up to date with the activities of these institutions and learn more about the visited area. In Lauenburg meeting participants had, among others, the opportunity to take a cruise on the Elbe aboard the steam side-wheeler "Kaiser Wilhelm" from 1900. Among many topics discussed, including preparation of a joint exhibition, it was also decided to send a questionnaire to nearly 90 European river museums. The aim of this action was to get detailed knowledge about these institutions. This questionnaire was sent in November 2015 by the National Maritime Museum in Gdańsk.

Part of participants of the 2 nd ENoRM meeting in Lauenburg
June 2015, photo: Holger Böttcher

A tangible effect of the Network's activities and contacts between its members was the opening on June 2, 2016 at the Transport Museum in Bratislava two poster exhibitions dedicated to historic ports and ships of the Baltic Sea. The opening of the exhibitions was carried out in cooperation with the Embassy of the Republic of Poland. The authors of both exhibitions were members of the Working Group on Maritime Cultural Heritage of the Baltic Region Heritage Committee, operating within Council of the Baltic Sea States. The original English-language posters were redesigned to include two language versions: Slovak and English.

The third meeting of the European Network of River Museums took place in October 2016 at the German Waterways Museum in Duisburg, Germany. It gathered representatives of 17 museums and 2 associations from 10 countries (Austria, Belgium, Czech Republic, France, Germany, Lithuania, Latvia, the Netherlands, Poland, Serbia). In addition to the presentations of the gathered institutions, topics related to the current and future functioning of the Network were also presented. During a lively discussion, the importance of direct contacts between river museums was emphasized, among which, according to the analysis of a questionnaire sent a year earlier, there are many

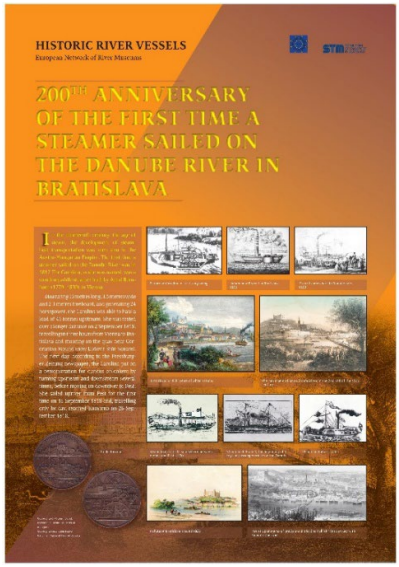
small and medium-sized institutions that have previously operated in a certain isolation, and directions for future activities were set: exchange of knowledge and experience, exchange of artefacts, organization of a joint exhibition, creation of a database and catalogue of European river museums and historic inland ships. The meeting in Duisburg was an opportunity for its participants to go on a study trip around this largest inland port in Europe.

Tour of the port and historic ships, Duisburg
October, 2016, photo: Philippe Cayla

The fourth meeting of European river museums took place between September 4 and 6, 2017 at the Technical Museum in Vienna. It was attended by representatives of 14 institutions from seven countries (Austria, Czech Republic, Germany, Latvia, Poland, Serbia, Slovakia). As usual, museum facilities and achievements, the history of navigation and the reconstruction of the Danube bed were presented, as well as the results of the analysis of the questionnaire on historical ships and temporary exhibitions sent in 2016 by the National Maritime Museum in Gdańsk to river museums in Europe. The meeting was an opportunity to learn about local museums and infrastructure related to the history, research and development of the Danube, including: Danube-Auen National Park implementing a pilot program for the renaturalization of the Danube banks (removal of stone fortifications, reconnection of side branches with the main riverbed) in order to prevent the lowering of the river bottom.

Visiting the permanent exhibition at the Technical Museum in Vienna
September 2016, photo: Jadwiga Klim

Between September 25 and 29, 2018, the fifth seminar of the European Network of River Museums was held at the Belgrade Museum of Science and Technology. It began with the opening of a joint poster exhibition prepared by 9 museums and organizations from Serbia, Germany, Austria, Hungary, Slovakia and Poland. Each of them presented material about a historic river ship from their collections, or about navigation on the river, the history and importance of which they document and popularize. The exhibition gives visitors the opportunity to learn about an important part of Europe's river heritage, which all our institutions aim to protect and promote. At this point, it is worth emphasizing the commitment of Gordana Karovič and Museum of Science and Technology in Belgrade - they prepared the graphic designs of all posters on their own.



An example of posters from exhibition on historic river ships presented for the first time in Belgrade in September 2018
design: Museum of Science and Technology in Belgrade

The “jubilee” meeting in Belgrade was attended by representatives of 14 museums from Serbia, Romania, Germany, Austria, Hungary and Poland. During the event, a number of papers on navigation on the Danube were presented, the last year in museums cooperating within the Network was summarized and the institutions that had joined it were presented. The seminar was also an opportunity to cruise on the Danube and visit other Belgrade museums, including: Yugoslav Museum and Nikola Tesla Museum.

Visiting Belgrade museums
September 2018, photo: Bernhard Weber

The sixth seminar of the European Network of River Museums was organized by one of the 8 branches of the LWL-Industriemuseum – the Westphalian Industrial Heritage Museum, namely the Henrichenburg Ship Lifts in Waltrop, Germany. It took place on September 10-14, 2019 and gathered representatives of 10 institutions from Germany, France, Great Britain, Austria, Serbia and Poland. At the meeting, in addition to the traditional presentation of museums news and plans, the issue of inland navigation in the Ruhr area was discussed. The participants agreed that the joint exhibition on historic ships should continue to expand (since the presentation in Belgrade, it has been enriched with 3 new posters) and be presented in other museums of the Network. The most important result of the meeting and the discussion was the decision to create the Network's website (by LWL-Industriemuseum) and to start the Network's activity in social media (Bernhard Weber from Duisburg). The seminar, as always, became an opportunity to get to know the region in which it was organized. Henrichenburg itself is an impressive complex with a ship lift from 1899, a lock from 1914, a lift from 1962 and a lock from 1985. Meeting participants on the steamship "Nixe" from 1939 sailed along the Dortmund-Ems canal to Dortmund and visited other branches of the LWL-Industriemuseum: the Zollern mine in Dortmund and the Nachtigall ("Nightingale") mine in Witten.

Guided tour during 6th meeting of the European Network of River Museums in Waltrop
September 10 – 14, 2019, photo: Jadwiga Klim

The next ENoRM meeting was held only after a 3-year break caused by the SARS-CoV-2 virus epidemic and the outbreak of war in Ukraine. On November 3 and 4, 2022, representatives of museums from Poland, Germany, Slovakia and Switzerland met in the Bydgoszcz Canal Museum in Bydgoszcz. The main purpose of the meeting was to discuss the future of the group and its next activities. The meeting confirmed the need

to create a website. Previously prepared poster exhibition devoted to historic ships from the collections of our institutions will be placed on this website in digital form. The same will happen with the database of historic ships, which will soon be prepared by colleague from Duisburg Dennis Beckmann. During the meeting, the vision, mission and aims of the Network were developed. Due to the complicated political and economic situation, it was decided that the next seminar, which will be held on board the barge "Willi" in Basel, will be devoted to the topic of endangered heritage. In addition to the discussions, participants also had the opportunity to learn about interesting objects related to the river and canal history of Bydgoszcz: the Bydgoszcz Canal Museum, Rother's Mills, Mill Island and a fragment of the Bydgoszcz Water Junction from the deck of a hausbot.

Meeting in Bydgoszcz Canal Museum
November 4, 2022, photo: Bernhard Weber

The eighth meeting of the Network took place between October 3 and 5, 2023 in Basel. It gathered almost 30 representatives of museums from Austria, France, the Netherlands, Lithuania, Serbia, Germany, Poland, Slovakia and Switzerland. The host was the Port Museum in Basel. The meeting consisted of two main parts. In the first one, entitled: "Challenges for museums. Problems and solutions", representatives of individual institutions presented them, pointed out the threats they face and characterized social phenomena related to the protection of river heritage. The main goal of the

second part of the meeting was to discuss the group's next activities. The functioning of the website (www.enorm-online.eu) and the Network's Facebook profile, which were created as an implementation of the decision made during the meeting in Bydgoszcz in November 2022, was summarized. The website, in addition to presentations of the Network members and reports from seminars, will soon feature a digital version of the exhibition about historic ships from the collections of our facilities and a database of historic ships being prepared. The topics and methods of organizing subsequent joint exhibitions were discussed. A decision was made to prepare and send to state authorities letters of support for museums that found themselves in a particularly bad situation. Meetings of the European Network of River Museums are always an opportunity to get to know local museums, history, conditions. So it was this time. On the first day of the seminar, Florian Röthlingshöfer, director of the Swiss Ports on the Rhine consortium, presented the history and operating conditions of ports and their development prospects. Members of the meeting also had the opportunity to take a tour of the port, visit the Port Museum and take part in a cruise on the Rhine on board the historic barge "Willi" from 1909. It was an unforgettable experience and opportunity to see Basel from the river.

Participants of the 8th ENoRM meeting in front of the Harbour Museum in Basel
October 5, 2023, photo: Paul Burtscher

After 10 years of functioning of ENoRM, we met at the Museum of Transport in Bratislava. During this time, we managed to build personal relationships and get to know our museums and regions. We used it many times, asking each other about informa-

tion, artefacts, and publications. We organized a joint exhibition about historic river ships. On this basis, we are working on a catalogue of historical ships. This is important because the dissemination of knowledge about heritage directly contributes to increasing the level of its protection. We have launched a website and a social media profile that promote not only heritage, but also our institutions. We managed to overcome the crisis of 2020-2022, which proves the strength of our group - informal, open, constantly developing.

Gdańsk, May 8, 2024

News from the „Elbschifffahrtsarchiv“ in Lauenburg / Elbe

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Abstract

In this contribution I will focus on the introduction of the Elbe Shipping Archive [Elbschifffahrtsarchiv], its history, development and current activities. It is a special scientific archive on the history of Central European inland shipping - especially shipping on the Elbe. It houses extensive holdings of technical drawings, books, archives and photos on many European waterways and is therefore the leading archive in Germany.

Keywords: Elbe Shipping Archive, Lauenburg, archive, collections, shipping

The Elbe Shipping Archive has been located at the ‘external’ site in Lauenburg at Elbstrasse 141 for 42 years now. Over the course of this long period, it has developed from very small beginnings into a ‘specialised archive’ with supra-regional and international significance. The newly created web site (www.elbschifffahrtsarchiv.de) has contributed significantly to this.

Parallel to the municipal Elbe Navigation Museum [Elbschifffahrtsmuseum], it is financed and operated exclusively by the Association for the Promotion of the Lauenburg Elbe Navigation Museum [*Verein zur Förderung des Lauenburger Elbschiffahrtsmuseums e.V.*]. It therefore occupies an important, special position that is not always common in the museum landscape.

Its main focus is the scientific reappraisal of Central European inland navigation history in various ways - from pure archive work to research topics and publications on specific individual areas.

The 'somewhat different organisation' of the Elbe Shipping Archive has an interesting history: it began in the late 1960s at a time of structural change in the Elbe shipping industry. The after-war-related reconstruction of the fleet had initially been completed, but political demarcations considerably hampered shipping on the Elbe.

This led to the abandonment of operations in many areas - and to the legitimate question:

'... where are all the documents, photos, technical documents and personal experience reports that survived the war and what to do with them ????...'

Because the representants of Lauenburg city with their "Elbschifffahrtsmuseum" had not properly recognised this situation – or did not want to accept it – the shipping companies from Lauenburg and Hamburg resorted to self-help and founded the promoter group 'Förderverein' in Lauenburg in 1967.

Important part of the articles of association was the focus on **"Research and archives".** A good and helpful connection with the just starting "Deutsches Schiffahrtsmuseum Bremerhaven" [German Maritime Museum] was founded as well.

The Lauenburg archive, as a non-profit organisation, started with a special staff, which carries out all tasks on a voluntary basis to this day. At present, we have 16 members in different fields of work under the direction of Werner Hinsch as Archive Manager.

In 1982, the archive moved into a separate building at Elbstrasse 141 – about 500m away from the museum - due to the constant growth in the number of records. Some years later a second building at the same place was added.

The inventory of the archives has 5 main groups:

technical drawings of various types and contents
archival documents, records, instruments
special library, visual and audio media
hydraulic engineering and stream maps
Research holdings and projects

According to the last investigation, about 50% of our documents are related to waterways outside of the river “Elbe”. Documents on Central European inland navigation history are increasingly forming the focus of the collection! Therefore, a changing of the name of the Lauenburg archive is currently under discussion. This may well be in the spirit of the founders more than 50 years ago!!

The new developments of recent years have also forced us to adapt our archive facilities. In addition to the building extension already mentioned (Haus Röhlke), all collection programmes are currently being reorganised, updated and brought together in a central computer. An important point for this is also the just finished correction of our **“Thesaurus”** after 40 years of use. This regulation has to be used for the whole inventory, independent of the thematic focus.

In case of ‘new additions’ to the archive, we have recently noticed an interesting trend:

“... a lot of grandchildren are finding documents during cleaning out of their grandfather’s attic - not only masters certificates, but also important records, books etc....”

Fortunately, they ask us in the “Elbschifffahrtsarchiv” first before they throw it away into garbage!!

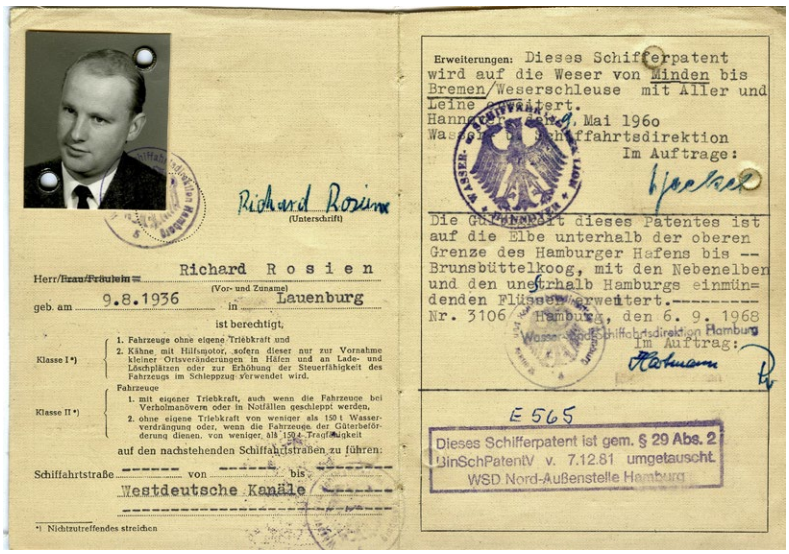
In such cases, we follow an important basic principle: “...**never say no**, also in case if we know or already have this document !!!...” There will always be a way to preserve

it - or to pass it on to another archive. Unlike some large museums, we generally don't spend weeks considering whether to say 'yes' or 'no'. Otherwise, the transferors usually feel annoyed, don't even come to the archive and dispose of them elsewhere. Many documents are then irretrievably lost!

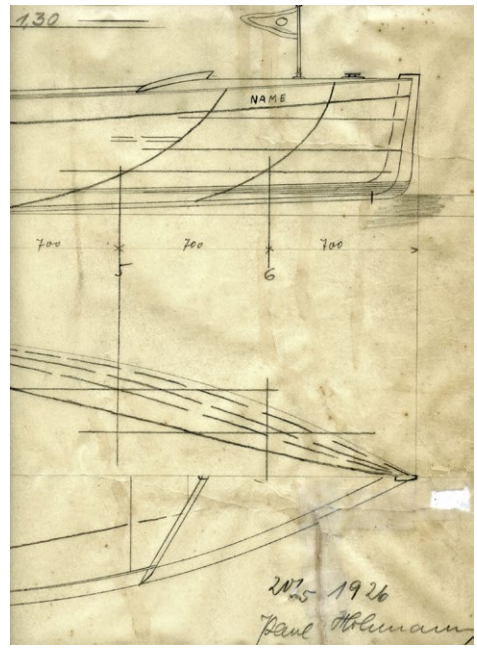
2 examples have to be noted:

the handwritten diary of the tugboat captain *Juchter* from the years 1895 to 1906

10 different masters' certificates for different European waterways from the shipmaster of *Rosin*



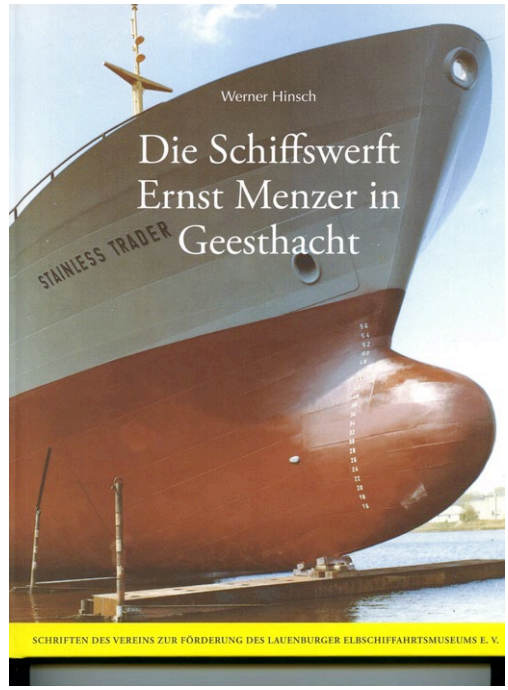
A very important new replacement for our division "shipyards" we got some weeks ago. The "Stadtmuseum Brandenburg a.d. Havel" gave us from their depot a large number of drawings of ship construction plans from the former shipyard *Paul (Dieter) Hohmann* for preservation. From 1922, this small shipyard built a lot of jolly-boats and small sailing ships for aquatic sports in the surrounding water-regions. These documents are for us most important, as water sports were previously only sparsely represented in our archives compared to commercial shipping.



This action shows very clear the importance of co-operation between archives. For ENoRM it will be an especially important fact !!

Mutual help and especially information is urgently needed – also in case of tight finances – sometimes self-help should be used.

This raises the general question of how the Elbe Shipping Archive is financed. As already mentioned at the beginning, the archive is financed exclusively by *Verein zur Förderung des Lauenburger Elbschiffahrtsmuseums e.V.* The government of Lauenburg city only pays a minimal share for the rental fee of the archive building! Important parts of works, which are normally handled by an extensive staff, are carried out by the "Verein...." at its own expense.



Additionally, there are 2 fields into the statutes:

- the realisation of research projects and publishing of special thematic matters (this part of statutes the directorate gives implicitly to the department of archives!)

Whilst research projects are only sporadic, extensive publications have appeared in the form of seven books and 18 booklets on specific smaller topics. The declared aim is to document events, companies and facts, which are normally not well known.

For this part see 2 examples:

- the shipyard ERNST MENZER in Geesthacht
- the inland shipping in central Germany 1931-1945

In the future this section will continue with 2 projects:

- the restart of shipbuilding in Lauenburg 1945-1959
- the history of “Arminiuswerft” in Bodenwerder on the Weser

Both projects are based on an intensive processing of our own extensive archives of the two shipyards.

Conclusions

Despite the large and positive development of the “Elbschifffahrtsarchiv”, it should not be forgotten that all jobs are only done by an unpaid staff. Without them the archive never could have survived all the time. Especially the noted aim of prioritising the preservation of technical documents will continue to determine the work of the Elbschifffahrtsarchiv in the future. The independence from every political and municipal influences together with the renting of a private building has confirmed its worth.

New projects on the Vistula River and in the National Maritime Museum in Gdańsk

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Abstract

Over the last year (2023-2024), many interesting projects have been carried out both at the National Maritime Museum in Gdańsk and on the largest Polish river - the Vistula. I describe the most interesting ones: 1) Vistula rigging workshops in Toruń, Warszawa and Kraków, 2) Establishing of the Przystań (Harbour) Muzeum, Branch of the Krakow Museum, 3) Temporary exhibition at the Vistula Museum "Man and the River. Boats and boatbuilders", 4) Database of Vistula boatbuilders, 5) Permanent exhibition "Gold for grain. The Maritime Power of Gdańsk" in **Żuraw**, a branch of the National Maritime Museum in Gdańsk.

Between November 2023 and May 2024, groups involved in recreating the Vistula boatbuilding and navigation traditions, shipowners, builders and users of wooden vessels, as well as Vistula museums - the Krakow Museum and the National Maritime Museum in Gdańsk, organized three editions of Vistula rigging workshops: in Toruń, Warsaw and Krakow. These cities are the most active centers of the renaissance of traditional Vistula boatbuilding. The first edition, in Toruń, took place quite spontaneously, and its success determined the organization of subsequent editions, in which the formula was changed from closed to open and the theoretical panel and educational component were significantly expanded.

The workshops consisted of both a theoretical part, prepared by museum workers and „people of the Vistula", and a practical part, conducted by experienced tackers. The theoretical part presented historical issues: the rigging of Vistula vessels in iconography, sources for researching the sailing propulsion of large boats and ships on the Vistula, as well as modern ones, including techniques for moving on the river on oars, spits, self-rafting and buoyancy.

During the practical part of workshops, sailors and taklers taught the participants how to twist ropes around jufers, pulleys and thimbles using a return weave, and then weave fenders. In the case of the workshops in Toruń and Kraków, the culmination of the events was the rigging of specific units: „Copernicus", built in 2021, inspired by a 15th-century *nasuta* type ship, and the galar (galley) „Szwajcarka", built in 2013.

Discussions between historians and practitioners were an important part of the workshops. It was only when we had to verify historical sources in practice that it turned out how little we knew. Archaeological, iconographic and written sources present the rigging of Vistula river vessels quite sparsely and generally. Moreover, they lack information about the permanent rigging connecting the mast with the stern. Without this element, in the opinion of practitioners - Vistula sailors - safe navigation is impossible. During the discussion, based on sources on the one hand and sailing experience on the other, places and methods of attaching the permanent rigging were selected. The workshops became not only an opportunity to learn, but also to verify historical sources in practice.

Practical part of rigging workshops in Toruń
November 2023, photo: Adam Niedziułka

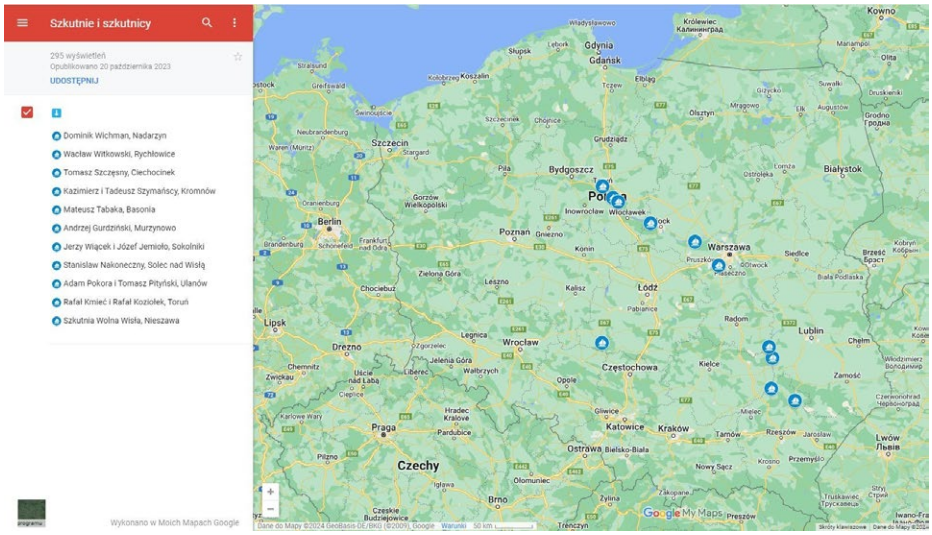
The Krakow workshops took place in the youngest branch of the Krakow Museum - Przystań Muzeum (Museum Harbour), established in 2023. It is to deal with the history and heritage of the river in Krakow. The marina is located at the mouth of the Rudawa River at the Vistula River. Galleys (galars) used to moor here, and in the interwar period there was a „Krokodyl" beach. In the past, the surrounding houses were inhabited by rafters - river people. Today, the Przystań Museum operates here near Flisacka Street. The genesis of its creation is the close cooperation that the Krakow Museum established with the Krakow neo-rafters' community during work on the „Wisła re-kreacje" exhibition a few years ago. This successful cooperation convinced the Museum management to continue and even go deeper into this topic and „take care" of the river's heritage. For this purpose, MK took care of the „Szwajcarka" galley, acquired 7 mooring piles and a fragment of land on Rodła Boulevard. This place is to become a space where these neo-rafters from Krakow will be able to cultivate traditions and the city's inhabitants and tourists will be able to get acquainted with them.

Harbour (Przystań) Museum, branch of the Krakow Museum
Photo: Matylda Wejdman

From Krakow we return north, to our museum. Striving to show the durability and continuity of the shipbuilding tradition on the Vistula, last year we opened the temporary exhibition „Man and the River. Boats and boatbuilders“ at the Vistula Museum in Tczew. It will be available until June this year. At the exhibition, we show typical fishing and communication boats from the lower and middle sections of the river, we try to recreate the interior of a boatbuilding workshop and we talk about the attempts made by the National Maritime Museum in Gdańsk to preserve boatbuilding traditions. We present the crisis of traditional Vistula boatbuilding in the 1990s and its revival in the 21st century. Combining the past with the present, we present contemporary boatbuilders, as well as environments and events that perpetuate and promote Vistula traditions. The exhibits collected at the exhibition come from the collections of Polish museums and contemporary boatbuilders. The vast majority of modern boatbuilding tools do not differ much from tools from museum collections. The continuity of the Vistula boatbuilding tradition has not been interrupted; despite obstacles and difficulties, it is still alive and creatively interpreted. The opening of the exhibition gathered a large number of people from Vistula community that reactivates rafting and boatbuilding traditions. In addition to the museum dimension, it also became an environmental and integration event.

Temporary exhibition “Man and the river. Boats and boatbuilders”
Vistula River Museum in Tczew, branch of the National Maritime Museum in Gdańsk 29/06/2023 - 16/06/2024
photo: NMM Gdańsk

One of the elements of the exhibition is the „Vistula Boatbiuilders Database” application, in which we present places where wooden boats inspired by tradition are built. The boatbuilders include both old, experienced craftsmen and their younger successors. We show their short biographies, the units they built, and the location of their workshops. Thanks to close cooperation with the Vistula community, from which I receive information about subsequent shipbuilders, this database is constantly expanded and supplemented.



Vistula Boatbuilders Database

My presentation must, of course, include information about the largest project implemented by our museum from 2020 to 2024: „Conservation, renovation and modernization of the Gdańsk Crane - a branch of the National Maritime Museum in Gdańsk together with the creation of a new permanent exhibition", for which in 2020 we obtained funding from the Financial Mechanism of the European Economic Area. On April 29, 2024, in the renovated Crane, we opened a new permanent exhibition entitled „Gold for grain. The sea power of Gdańsk". In the 17th century, Gdańsk was the largest port in the Polish-Lithuanian Commonwealth. Its power was largely due to the Vistula River, which transported huge amounts of grain and wood to the city, and the inhabitants of Gdańsk became intermediaries in overseas trade and shipowners with large fleets. Thanks to their entrepreneurship, Polish goods reached, among others, to England, France and the Netherlands, and products imported from Western Europe reached the markets of Krakow, Warsaw, Vilnius and Lviv. The port of Gdańsk was teeming with life, and its characteristic crane - the Crane - had already become a symbol of the city.

The Crane
photo: NMM Gdańsk

A historical figure tells visitors how fortunes were made and lost in 17th-century Gdańsk: the sailor and shipowner Hans Kross. Coming from Rostock, he settled on the Motława River and in 1662 became a citizen of Gdańsk. In the following rooms, together with Hans Kross, we follow the story of the captain of a merchant ship that arrived in Gdańsk. We enter the Bay of Gdańsk with it, where we wait in the roadstead for pilotage and moor under the Wisłoujście fortress. We pay customs fees and only then enter the internal port. After reloading, we sell and buy goods. When the ship is repaired and ready for the next journey, we rest together with the sailors in the port tavern, which is what I wish for all of us.

Gdańsk, May 9, 2024

Current Affairs in a History Museum
The Exhibition “Container. The Global Box”

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Abstract

Historians of technology classified the freight container as the most important innovation of the 20th century. Globalisation would have not been possible without it. So the LWL-Museum Schiffshebewerk Henrichenburg, which is situated at a historic ship lift on the Dortmund-Ems-Kanal in the Ruhr District of Germany, decided to do an exhibition which refers to all aspects of the container story. Part of the exhibition will be staged in a building erected with 40ft-containers.

Keywords: container, globalization, exhibition, shipping

The Henrichenburg ship lift is a technical monument built in 1899 – a thing of the past. And the main task of our museum, which inhabits the place today, is to document and explain the history of the building and the history of inland navigation on the canals in North-western Germany.

But we are interested not only in dealing with bygone events but also in highlighting present and future trends. We think that such topics are speaking to all our visitors, not only for those fascinated by historical facts. In this way we follow the motto of our meeting: “Renewing Museums”. So, we are always looking for fitting topics for our special exhibitions. But never we were concentrating so much on current and upcoming affairs than with the show we are currently working on.

Museums are about objects. So, we asked ourselves: What single object is best suited to represent our current economic, social and political conditions? And our answer was: the standard freight-container. The introduction of this box had far-reaching consequences that no one had initially foreseen. It turned both the transport and the production of the world economy upside down. And it developed into the core element of globalization. No other object is able to symbolize this megatrend of our time more vividly.

So, we decided to do an exhibition on that inconspicuous steel box. “Container. The Global Box” is scheduled to open on April 12, 2025, and should run until April, 12, 2026. What helped is that this topic has become more explosive just recently: The blockade

of the Suez Canal by the stranded container ship EVER GIVEN and the corona-induced closure of several major container ports in China have shown how vulnerable the world´s tightly interwoven supply chains are. Never before have the consequences of such gridlocks been felt so acutely by so many people. And the story goes on: The latest disruption is caused by Houthi rebels firing rockets at container ships approaching the Suez Canal.

The exhibition building

Our main object is the container. And we decided to do something that is uncommon for exhibitions in history museums: We put the container front and centre and don't bother to loan a lot of other more or less distinguished objects from near and far to impress the visitors. And the most impressive thing you can do with containers is to erect a building. We started our work with commissioning an exhibition venue consisting of these boxes.

We asked three architects for drafts of a container building. Professor Han Slawik, who taught architecture at Hannover University, is credited with inventing container architecture at the end of the 1980s. His competitors, Art Department from Berlin and Containermanufaktur from Rüdersdorf, made their names with prominent container structures at trade fairs and music festivals. The competition was won by Containermanufaktur. But it is not easy to get from a draft to a building, as we are currently experiencing. It is still not clear if we will be able to turn our architectural dream into reality. Luckily, we have some more space in houses and ships at our site, so the exhibition will be held – no matter what.

1: The winner of our competition: the exhibition building for Waltrop by Containermanufaktur

Themes of the exhibition

Brainstorming on what the container stands for, we came up with a dizzying array of aspects. Instead of concentrating on certain fields we decided to tackle them all. To organize this information overload, we arranged the themes into five chapters: Innovation, Transport, Production, Perspectives, and Module.

I Innovation

01 The Box

First visitors need to know how a container is constructed. So we will let one box “explode” to lay bare all the parts it consists of – the frame, the walls and the corners where the containers are connected.

02 The Standard

The real achievement was not the invention of the metal box but the global enforcement of the standard, which required a corresponding political and economic power structure in international relations. Today, there are 40 different rules that specify exactly what a container must look like: They range from the size of the doors to the location of the connectors. A separate department of the International Organization for Standardization (ISO) in Switzerland works on these standards, which have been in force worldwide since 1968. To broaden the subject, we use container standards as an example to let the visitors ask themselves: For what do you really need international standards?

03 Beginnings

Admittingly even this exhibition can't proceed without any historical deliberations. The American businessman Malcom McLean is regarded as the inventor of the sea container. His idea was as brilliant as it was simple: instead of loading bags, bales and pallets individually, they were transported together in standardized boxes. This saved time and money. In 1956, he sent the first container ship on its journey from Newark to Houston. His idea really got off the ground when he was awarded the lucrative contract to supply the U.S. military with goods during the Vietnam war. in 1966 the first container ship reached a European port.

II Transport

04 Transport before the container

Before the container it took a lot of time and money to change between the transport systems of ship, rail and truck. In the seaports, experts were needed to fill a ship's hull with confusing variety of barrels, crates and sacks in a space-saving way. Thousands of port workers emptied the ships and brought the goods to huge warehouses on the water's edge where they were sorted, controlled and prepared for the next leg of transport.

2 Port of Hamburg, 1950

3 Port of Hamburg, 2022

05 Transport with the container

The container put an end to all that. Goods stuck in a container can now be transferred easily from one mode of transport to another, not only on the seacoasts but also inland. To shed a light on the workings of container transport we decided to follow one specific container from Asia to our home town, Waltrop. Luckily Hase Bikes, a Waltrop company producing high quality e-bikes, agreed on organizing their next delivery of bike frames together with us. So we are able to track a real container from the facto-

ry in Taiwan to the terminal in Kaohsiung and further on via the container ship ONE INNOVATION to Rotterdam and via inland navigation to Duisburg and finally via lorry to Waltrop. Fortunately, everybody being part of that complicated transport chain is happy to work with us.

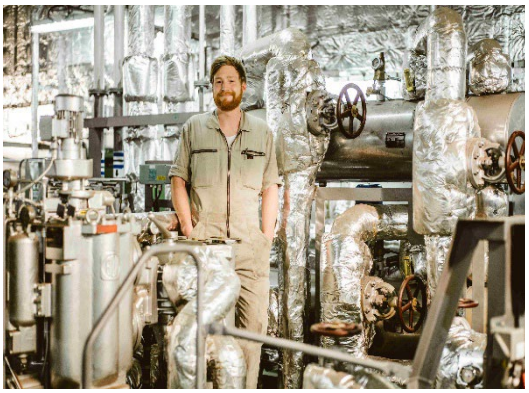
06 Ports

The structural change the container brought had dramatic consequences for port cities. In less than ten years huge parts of the waterfronts and thousands of jobs simply became obsolete. Some cities were able to cope, and others suffered badly. We follow the developments in four typical port cities: New York, Liverpool, Hamburg and Shanghai.

07 Smuggling

In the TV news you see containers at two different occasions: when the ups and downs of the economy have to be depicted, or when the customs authorities have discovered a spectacular hoard of smuggled goods. Containers are the back bone of modern transport, so in them you'll find everything forbidden that is imaginable. Drugs are most common, but also weapons, protected animals, plastic waste – and sometimes even refugees.

4 Cocaine hoard in an Oldtimer VW Bus, 2018



5 Engineer at a Hapag-Lloyd vessel, 2016

08 At Sea

Of course every visitor wants to know how life is like on the big ships where crews are working for months on end. A few photographers were allowed to document such journeys and a few sailors share their experience with the public via social media. But not every container reaches its destination. A lot can go wrong along the way, and spectacular accidents happen.

III Production

09 Working and Shopping

The container transformed not only the world of transport but also the world of production. Transporting goods in containers is so cheap that distances are irrelevant when companies are thinking about relocating work and redistributing supply chains. Today, orders are placed „just in time“ so that components arrive at the factory exactly when they are needed. And „global sourcing” means a product like a smartphone or a Barbie doll consists of parts produced in many different countries worldwide. This guarantees low costs, but leads to problems if the ships cannot sail as planned. So our visitors are affected in two ways by the container revolution: As workers they saw a lot of jobs and entire industries disappear to far-flung countries, but as consumers they can count on an overwhelming supply of cheap wares. The export of Kiwis and Avocados or of disposable items like T-shirts for one euro would be unthinkable without containers.

6 Old industry: Sewing clothes in Germany, 1960

7 New product: Kiwis from New Zealand

IV Perspectives

10 Ecology

Container transport affects the environment. The big ships are carrying invasive species of plants, insects and snails to every corner of the globe. They run on bunker fuel, one of the worst air pollutants imaginable. So they contribute to climate change, and they are affected by it, because increasingly droughts are endangering the transport on rivers and even on the Panama Canal.

8 Container ship on the Rhine, 2018

9 Planned new chip-factory in Magdeburg, 2022

11 De-Globalisation

The container favoured new competitors in the international economic system. In 2016, China replaced the USA as Germany‘s most important trading partner - one of many proofs of the resounding effect of the global box. But in many places the consequences of globalisation have provoked a counter-movement (like Brexit). The hope that trade promotes democracy is waning, so there is talk about “decoupling” from states like China and Russia. And as the supply chains are stressed by many conflicts, companies think about “re-shoring” workplaces. Has globalisation reached its zenith?

V Module

12 Design

Containers are modular, flexible, stable and inexpensive. This makes them per se a typical object of the modern age. Product design follows the same logic – in furniture like IKEAs Billy shelf or toys like LEGO bricks.

13 Architecture

The modularity of containers also make them a popular building material for architects from all over the world. While a few years ago mainly temporary buildings were created from containers, today they are often sustainable buildings with a long lifespan.

10: FREITAG store in Zurich by spillmannechsle, 2006

11: Sculpture in Le Havre by Vincent Ganivet, 2017

14 Art

Containers are not just transport crates. They also provide surfaces, a shape and a space, and they symbolise current debates. So graffiti sprayers use their walls, and artists take them as a material for expansive installations that often relate to globalisation.

15 Cinema

Containers trigger moods and feelings in us. Cinema picks up on them and shapes them. Across all genres, containers create a setting that triggers unease and guarantees suspense. Deserted environments with high steel walls create an unreal and threatening atmosphere, which is often intensified by darkness at night. In our volatile times, the container conveys a sense of being lost and transient: there are no more certainties, everything is provisional.

Conclusion

For better or worse, the container shapes our life style. So it is the ideal object to let a history museum stray into contemporary territory and ask questions about the future.

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Wiener Neustädter Canal

Expansion of the shipping exhibition in the Museum of Technology in Vienna Historical background of freight transportation before the railway age

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Abstract

By the late 18th century, the road network was no longer able to cope with the rapidly increasing transport volume. Supplying the city of Vienna with building materials, food and firewood for its expansion required the use of efficient canal boats. The 64 km canal route between Wiener Neustadt and Vienna was modelled on the highly efficient narrow canals already operating in England. The 2.21 m wide chamber locks were capable of accommodating 2.05 m wide and 22.8 m long symmetrical canal boats, transporting 30 tonnes of cargo and drawn by just one horse. The Canal was excavated using only pickaxes and shovels and took six years; it was commissioned in 1803. Only the advent of the railway in the mid-1870s rendered the Canal unprofitable. The area between Biedermannsdorf and Vienna was drained from 1879 onwards. The route was then used by the Aspangbahn railway line from 1881.

Keywords: bulk goods transport, industrial revolution, transportation network

To illustrate the technical design of the canal, lock 24 is printed out as a 3D architectural model with filaments in 4 different colors; one side of the model is cut out so that the structural design can be seen. The chamber lock at Kottingbrunn with canal boat is shown on a scale of 1:50. The walls of the locks built from 1797 under the supervision of Sebastian v. Maillard had brick walls; these were destroyed by frost in the first years of operation, so that a complete renovation with stone blocks was necessary up to 1850. The 8-foot-wide (2.53 m) design chosen by Maillard‘s successor Joseph Maria Schemerl from 1799 onwards had stone blocks below the waterline. After the widening of the canal and the expansion of all the locks, ships with a width of 2.30 m were able to transport a load of 30 tons from 1840 onwards.

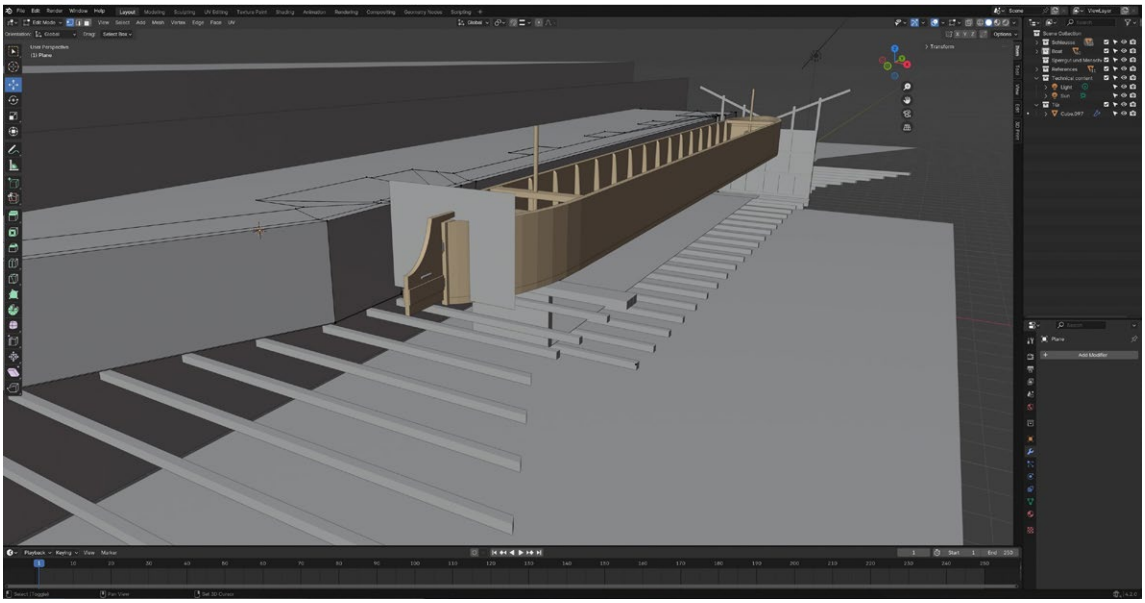


Illustration labelling: Chamber lock 24 with canal boat near Kottingbrunn, rebuilt 1819

At the beginning of industrialization in the mid-18th century, shipping canals were already established in Great Britain and the Netherlands. The English canal network in 1721 comprised 1,900 km!

When we have a look at the development of the population, we can imagine how much the demand for raw materials increased at the end of the 18th century:

Inhabitants of Vienna and suburbs
1750: 180,000
1800: 270,000
1850: 550,000

The approximate Firewood demand in Vienna around 1840:
1.7 billion cubic meters

With the first period of industrialization, the cheap transport of firewood and building materials to Vienna became increasingly important.

Realised Canal and railway projects between 1730 and 1890 (among others):

4b	Wiener Neustadt Canal Vienna-Vienna Neustadt/Pöttsching 1803/1811
6	Franzens Canal 1802
8	Bega Canal 1727
9/10	Horse-drawn railway Linz Budweis/Gmunden 1832/1836
11	Emperor Ferdinand's Northern Railway (1837/1856)
12	Aspang railway 1881

First Canal in the monarchy:

The **Bega Canal** in today's Serbian-Romanian border region was built by military experts to drain the marshes along the Bega River from **1727-1733** and was used for shipping until 1967.

The DDSG stern-wheel steamer *Temesvàr* travelled here in the 1890s. Currently the canal is being extended to Timișoara again.

Realised Canal and railway projects between 1730 and 1841 (among others):

Bega Canal 1727
Franzens Canal, today called Batschka-Canal 1802
Wiener Neustadt Canal 1803extension to Pöttsching 1811

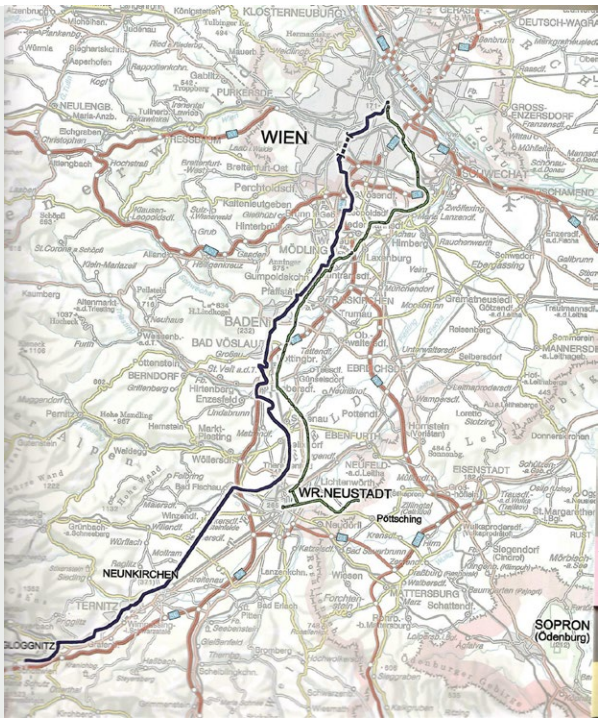
Horse-drawn *railway Linz Budweis/Gmunden* 1832/1836
Emperor *Ferdinand's Northern Railway* (1837/1856)
South Railway 1841

So, the Wiener Neustadt Canal was one of the earliest infrastructure projects in the monarchy.

From the 1780s onwards, the monarchy had extensive plans for the construction of canals, which were modelled on international examples. Before the railroad, freight transport by canal boat was a highly efficient means of transport. It was many times superior to the coach. On the road a horse can tow a cart with one ton, on the canal a

boat with 30 tons. Also compared to the horse drawn railway, on the water a horse can pull a four times bigger load.

draft 1795: Gloggnitz – Vienna
realised route 1797-1803: Wiener Neustadt - Vienna



There were several problems during the construction: on the one hand there was a lack of workers due to the war with France (1799-1801), additionally construction failures such as leaking dams appeared. In 1799 Joseph Maria Schemerl succeeded Maillard as director of construction, from then on, the locks were built wider (2.53 m instead of 2.21 m), and the Dam in Kledering (in the south of Vienna) was new constructed.

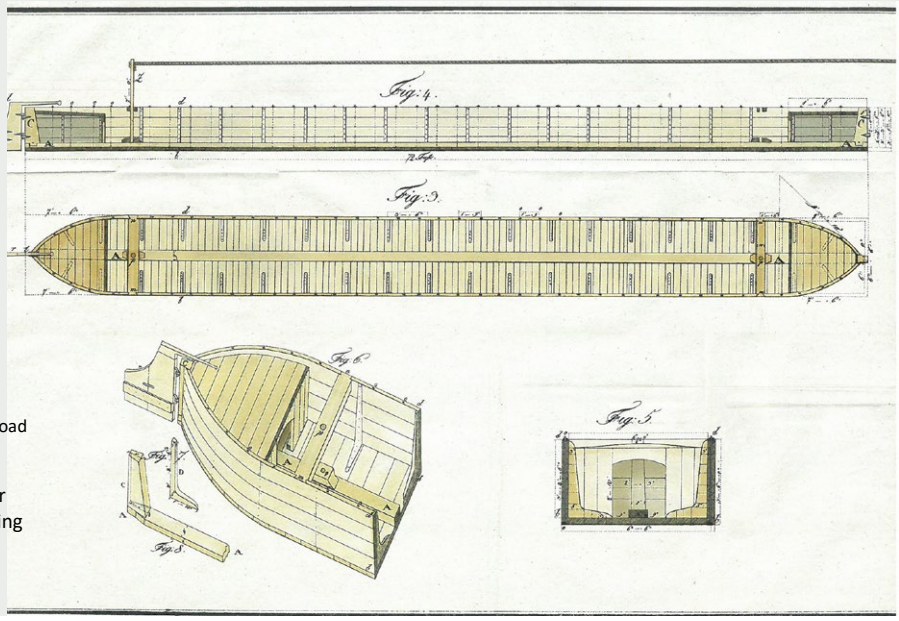
The construction works of the canal section between Vienna and Wiener Neustadt lasted till 1803. In the end, the canal did not cost 3.7 million guilders as planned, but 11 million guilders (so three times more than originally calculated!). Because most of the money came from the state, the canal was nationalized in 1802, and the Canal Fund took over its management under the supervision of the Court Chamber until 1822.

The Opening of the Canal was on 12.05.1803, the original distance between Vienna and Wiener Neustadt was 57 km (later with the extension to Pöttsching and some short stub canals 64 km).

Canal trapezoidal cross-section:

Width: 11 metres at water level
Bottom: 6 m
Depth: 1.26 m/ then 1.60-1.90 m, average 1.58 m

1805:
60-70 boats



Canal boats
(similar to the British narrow boats):

Length: 22.8 m

Width: 2.05 m / 2.15 m / 2.30 m (from 1840)

Loaded draught: 0.97 m (payload 22 t / 30 t)

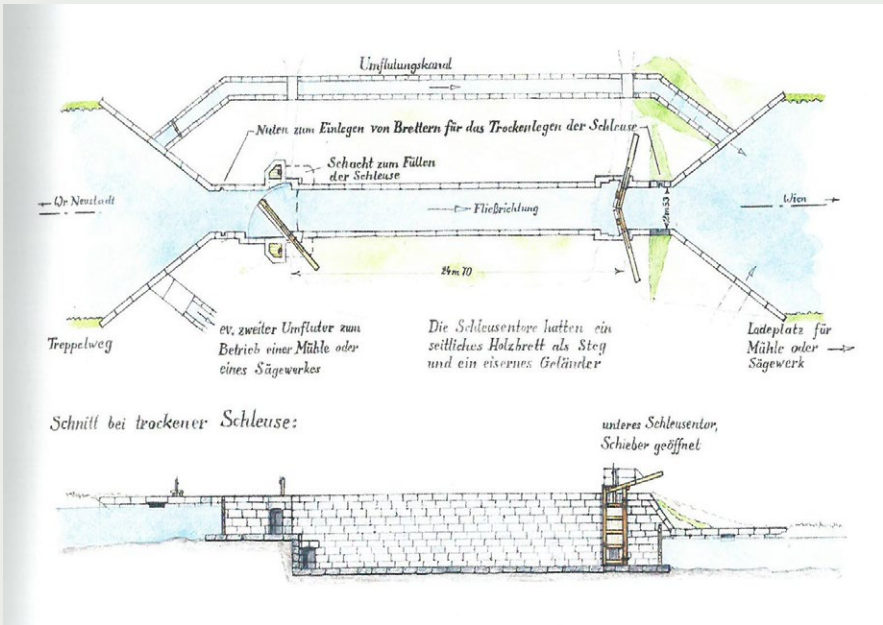
Built symmetrically, rudder was reversed when changing direction of travel

Canal boats (similar to the British narrow boats):

Length: 22.8 m
Width: 2.05 m / 2.15 m / 2.30 m (from 1840)
Loaded draught: 0.97 m (payload 22 t / 30 t)

Built symmetrically, rudder was reversed when changing direction of travel

45 Locks



Lock chamber size:
Length: 24.70 m
Width: 2.21 m / 2.53 m
Height difference: 1.96 m
managed in 3 to 4 minutes

Lock chamber size:

Length: 24.70 m
Width: 2.21 m / 2.53 m
Height difference: 1.96 m managed in 3 to 4 minutes

The height difference of 100 meters between Wiener Neustadt and Vienna was overcome with 50 locks. The boats were perfectly fitted to the chamber size, lateral there were only a few centimeters left up to the lock wall.

1 horse
3 men
30 t
57 km (from 1811: 64 km)
1,5 days
350-400 employees (1808)

With one horse and three men (a navigator, a horse driver and a helper on the forecastle), up to 30 tonnes could be transported. The journey time between Vienna Neustadt and Vienna was 1.5 days (from 1808). The service ran from 1st April to the end of October, after which the canal was cleaned.

From 1808 to 1854, Count Hoyos' timber companies delivered 50,000 cubic metres of timber per year to Vienna with their 30 own boats. In total 42,000 tonnes were transported with 2,200 barges. 1808 was also the first year in which the canal made a profit.

Lock 34 at Kottingbrunn with gates

Most of the 45 locks outside Vienna were initially built in mixed construction (walls made of brick, only lock heads made of sandstone blocks). They were already destroyed by frost in the first years of operation, so that a complete renovation with stone blocks was necessary until 1850 (locks Nr. 1-24 were pure block locks, the rest finally had stone blocks up to the waterline, above bricks).

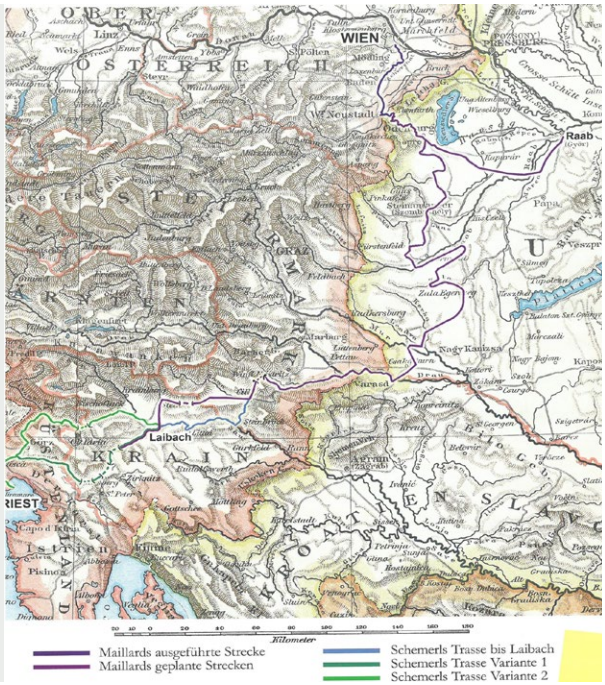
In 1811 the canal was extended to the Austro-Hungarian border near Pöttsching, when brown coal was found in the area of Pöttsching and Neufeld. However, the actual purpose was to connect the coal mines in Sopron/Ödenburg, therefore Pöttsching was only built as a transit station. This extension never took place, this decision was official in 1828. Still until the early 1820s, there were plans to extend the canal even to the Adriatic based on the designs of Sebastian Maillard and his successor as chief designer, Joseph Maria Schemerl.

Extension plans between 1802 and 1820:

Danube-Adriatic Canal

[Vienna - Györ - Ljubljana - Trieste]

700 km,
2 tunnels, 5 km à
560 locks



The utopia of the Danube-Adriatic Canal (Vienna - Györ - Ljubljana – Trieste):

700 km,
2 tunnels, each of them 5 km
560 locks

As a result of the coalition wars against France, the state funds were empty, and the project was cancelled. Beyond that the project would not have been technically feasible, which *Schemerl* must have realised around 1820, so there were no further efforts to push ahead the project. Today, it is estimated that the construction project would have taken around 80 years with the resources available at that time.

However, the first years of the state-owned canal were mainly characterized by technical breakdowns and economic problems. Between 1814 and 1818 the business made losses because of floods on the Leitha river, necessary lock repairs and also misappropriation of funds! The canal was therefore leased to private operators from 1822 onwards.

Until 1871, the canal was leased by 5 businessmen:

1822-1827 banking house *Fries/Moritz v. Fries*
1827-1834 *Matthias Feldmüller*
1834-1846 *Georg v. Sina*
1846-1857 *Alois Miesbach*
1857-1871 *Heinrich Drasche*

The canal leased 1822-1871

Connecting railway after 1857 in the former canal bed

As already mentioned, in 1828 all expansion plans, such as the continuation to Györ/Raab and thus the important integration of the Sopron/Ödenburg area for the transportation of lignite to Vienna, were finally abandoned. By 1845, the canal leaser *Sina* had purchased wider boats (2.30 metres) with a larger transport capacity (of 30 tonnes), as all the locks between Vienna and Baden were widened to 2.53 metres.

In 1847, when the main customs office was completed in Vienna, the old canal harbour had to be abandoned and a new harbour 1.7 km to the south was built. The old canal bed in the 3rd district was used for the connecting railway between the new southern railway (opened in 1841) and the northern railway (1838). The new canal harbour at Aspern Straße was opened in 1849.

Am Kanal/Lory Straße, Vienna Simmering (before 1930)

In 1857, when the demolition of the city walls started, and the construction of the Vienna Ring Road began, a building boom developed, which made the brickworks owner and canal tenant *Heinrich Drasche* one of the richest men in Vienna. As a result, transport volumes on the canal rose once again to an all-time high in the mid-1860s. Nevertheless, the problems for the canal got bigger. The construction of the 1st Vienna High Spring Water Pipeline caused a water extraction from the Schwarza, which is a water supplier of the canal. This resulted in long court disputes between the city administration of Vienna, the leaseholder Drasche and the ministry.

At the end of the 1860s, the government decided to privatise the canal, an sold it to a bank which founded the „Erste österreichsiche Schifffahrts-Canal-Actien-Gesellschaft“ (=Austrian shipping canal company). By 1876, the volume of transport on the canal decreased sharply because of the ever-stronger competition from the increasingly denser railway network. Subsequently the Belgian railway company joined the canal company in 1876. Very soon they tried to get the license for the construction of a railway line from Vienna to Salonika; its first section was to go to Wiener Neustadt and further on to Aspang.

Canal an railway after 1871

Aspang railway station on the site of the second canal port, in operation from 1881-1977

The more powerful and reliable locomotives combined with improved braking systems enabled higher wagon loads and therefore lower freight prices. There was also competition by black coal from Moravian Ostrava, as a result the sales market for lignite/brown coal from the Neufeld area became smaller and smaller.

After 1876, the canal company renamed themselves to „Austro-Belgian-Railway Company“ and began with construction of the railway line Vienna-Aspang. The Wiener Neustädter Canal was converted into a works canal with occasional operations, while the Pottendorfer railway (opened in 1874) and the southern railway took over freight transport in the industrial quarter in the south of Vienna. This led since 1879 to the gradual draining of the canal section between Biedermannsdorf to Vienna.

The harbour walls of the second canal port (at the former Aspang railway station) were discovered during excavations

The new Aspang railway station was built on the site of the former second harbor basin south of Aspang-Straße (today the *Village im Dritten*-urban expansion area), and the railway was opened in 1881.

In Vienna, the canal bed was filled up in in the 1930s when it was not used by the railway. During the Second World War, the rest of the canal bed was severely damaged in certain areas, so that it was planned to fill it up completely.

heritage-protected canal:

36 km
17 bridges
38 former locks,
7 aqueducts

However, the Canal was still used for irrigation, firefighting and power generation; therefore, the federal state of Lower Austria took over the canal in 1956. Since 1973 36 kilometers of the original 64 km could be preserved, and the canal banks can be travelled by bicycle. Nowadays the Canal is a listed historical monument.

The use of interactive elements in ship / water transport museums[1]

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Abstract:

The article summarises preliminary results of a research focused on the topic of interactive elements in ship museums both from the visitors' and museum perspective. Interactive elements can refer to any portion of an exhibit in which a visitor must use one of the five senses (touch, see, hear, taste, or smell) to engage with the exhibit. They provide all kinds of hands-on, actively engaging experience and can have different forms, whether they are mechanical (analogue), digital, using new media or any other combination. They serve an educational and supportive role in exhibitions, strengthening the narratives, helping visitors to better understand the presented topic, or highlighting the artifacts on display. The preliminary studies conducted aimed to find common trends among water transport /ship museums and to uncover possible challenges for further study, as well as to find the visitors' preferences.

Key words: interactive elements, museum, ship museum, water transport museum

Museums are cultural institutions that, according to ICOM, aim to research, collect, conserve, interpret and exhibit both tangible and intangible heritage for the purpose of education, enjoyment, reflection and knowledge sharing among their public.2 However, museums are not the only cultural institutions that offer the public a space to spend their free time. Nowadays, people have a wide range of leisure activities to choose from and museums and galleries are not always the first choice for many. Therefore, if museums want to succeed in this 'battle' for visitors, they need to adapt their approach to the development of exhibitions and displays, as well as their overall offer. One way to do this is to use the principles of museum pedagogy, which also involve the use of various interactive elements in exhibition activities.

In this article, I would like to summarise my research focusing on the topic of interactive elements in ship museums as a specific subcategory of water transport museums. It ties into our grant project concentrating on the topic of shipping and the lives of boatmen on the Danube in 1970s and 1980s. One of the aims of the project is also

[1] The study was carried out under the framework of a grant VEGA no.1/0698/22 "*Czechoslovak cargo and passenger transport along the Danube River in the 1970s and 1980s*"

[2] International Council of Museums. *Museum definition*. Available online [accessed 2.7.2024]: https://icom.museum/en/resources/standards-guidelines/museum-definition/

to promote the opening of a museum of water transport in Bratislava as part of the Slovak Technical Museum – Museum of Transport. Museums are an important part of cultural / heritage tourism, which constitutes a big part of world economy nowadays, and they play an important role in drawing visitors to certain locations. Visiting heritage places is even a motivating factor for around 40 per cent of people when deciding where to travel.3 Ship and transport museums fall (mostly) under the category of industrial heritage tourism, which has grown in popularity in recent years as well. One of the major draws of industrial heritage is the authentic experience of the site it can offer to visitors, thus leading to, among others, improved learning and understanding of this specific heritage. This in turn can have a positive impact on its protection and subsequent revitalisation of the area.[4] The planned Museum of Water Transport would also be situated in a historical industrial area of Bratislava – in the shipwrights´ hall of the Winter Harbour, thus providing an extension of the pedestrian zone along the Danube from the city centre.

When it comes to museums themselves, one of their main missions regarding the public has always been education. The only thing that changes is their approach to the topic. Nowadays it is mostly recognised that museums, as places of life-long and free-choice learning, should offer different ways of accessing information by enabling different learning styles,[5] and interactives present us one such an option. There are multiple formats of active learning (not only) in museums – since the end of the 20th century, we see a gradual rethinking of the traditional educative approach in the museum. George E. Hein is one of its pioneers with his idea of a *constructivist* museum where the visitors learn by making associations with familiar categories.[6] Of course, there are more models for enhancing museum learning, like *interactive experience model, learning by doing or participatory museum*. The key point for them all is viewing learning as an active, complex and social process that might even challenge the authority of the museum. They also always need to have an educational element incorporated.[7]

It is also acknowledged that physical interaction with exhibits allows visitors to re-evaluate their theoretical understanding and by adding multisensory elements to exhibitions (sounds, smells, touchable exhibits, microscopes, etc.) we can also increase visitor time and learning. By focusing visitors´ attention on objects, we are making the exhibitions more fun and engaging, helping the objects "come to life". This "sensory turn" in museums has led to an increased interest in multisensory learning strategies that focus not just on younger audiences, but adults or learners with disabilities as well. When applied to the learning process, it can lead to many positive skill developments, such as better information retention, improved language skills, better performance on reading tests, enhanced engagement, or improved ability to multitask.[8]

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[3] White, C. *Museums and Heritage Tourism. Theory, Practice and People*. Routledge, 2023, p. 22-23.

[4] Wei, C.; Zhang, T. Authenticity and Quality of Industrial Heritage as the Drivers of Tourists' Loyalty and Environmentally Responsible Behavior. In: *Sustainability*. 2023, 15, 8791. Available online [accessed 2.7.2024]: https://doi.org/10.3390/su15118791

[5] Hooper-Greenhill, E. *Museums and Education. Purpose, Pedagogy, Performance*. Routledge, 2007, p. 3-5, 12-13.

[6] Hein, G.E. The Constructivist Museum. In: Group for Education in Museums. *Journal for Education in Museums*. No. 16, 1995 p. 21-23

[7] Roppola, T. *Designing for the Museum Visitor Experience*. Routledge, 2021, p. 39-47.

[8] Levent, N. and Pascual-Leone, A. (eds.) *The Multisensory Museum. Cross-Disciplinary Perspectives on Touch, Sound, Smell, Memory, and Space.* Rowman & Littlefield, 2014. p. 16-18.

Active engagement in exhibitions can be achieved in multiple ways. First though, it is necessary for each institution to reflect on what it means to actively engage visitors in their spaces, what they hope to achieve by doing so, and how they can improve on or expand existing interactive elements. It has been proven that interactivity in exhibitions leads to enhanced learning via prolonged attention to the exhibited content. The main role of interactive elements should also be tied to their educational potential – we should not use them just for the sake of having them in our exhibitions. In fact, some researches conclude that all interactive elements essentially fulfill the same functionality as label content, just in a more engaging manner.[9]

Interactive elements can refer to any portion of an exhibit in which a visitor must use one of the five senses (touch, see, hear, taste, or smell) to engage with the exhibit. They serve an educational and supportive role in exhibitions, strengthening the narratives, helping visitors to better understand the presented topic, or highlighting the artifacts on display. There are many types we can use in museum practice and we could divide them into two main categories: Mechanical (physical) interactives such as hands-on features, worksheets, mechanical elements, workshops, kids´ zones, games, drawers, etc., and Digital (information technology) interactives like audio guides, animations, short videos, interactive programmes and games, touch screens, etc. Plus, we could add a Hybrid interactive exhibits category, which combines digital technology with mechanical elements. The choice of what and how to use is up to each institution. Nowadays, they are becoming much more common in all types of museums.

Surveys

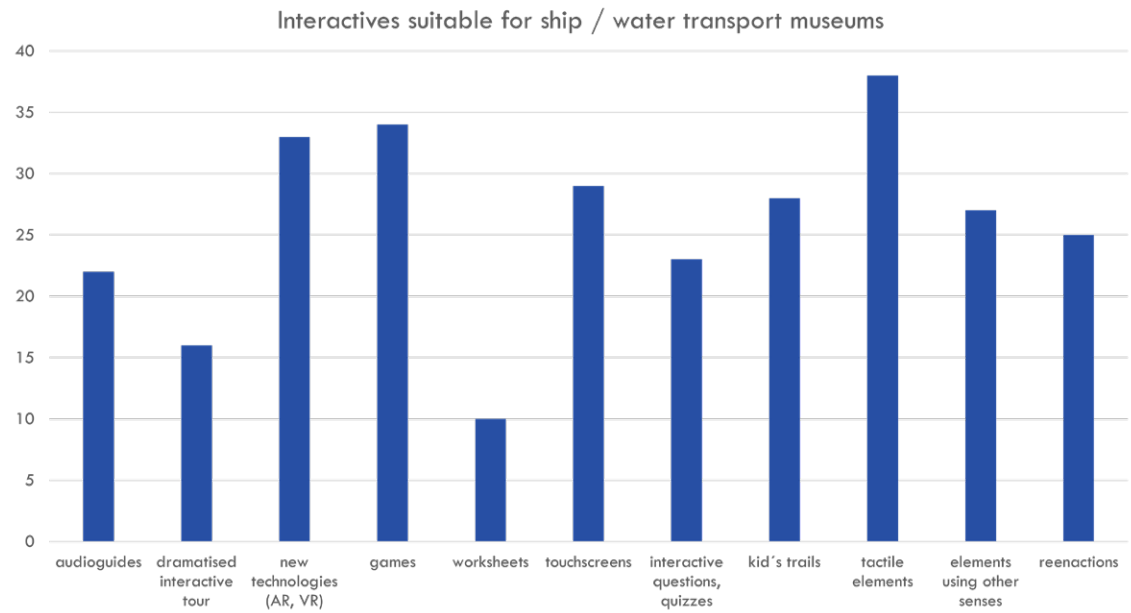
As a part of my research, I conducted two studies: "The use of interactive elements in ship / water transport museums - visitor perspective" (15 questions, February-May 2024, 52 responses) and "Museum education and the use of interactives in ship / water transport museums" (22 questions, April-July 2024, 22 responses out of 44 contacted museums). The first survey was conducted via social media, the second one via direct emails to water transport museums. The preliminary studies aimed to find common trends among water transport /ship museums, see their approach towards the use of interactives and to uncover possible challenges for further study, as well as to look into the visitors' expectations and experiences with interactives in (water transport) museums and see how it overlaps with museum work.

Visitor survey was undertaken by 52 people between the ages of 18 and 65, the biggest group at 44% constituted people between 25 and 34; 58% identified as female and 42% as male. As for country of origin, 52% come from Slovakia, 13% from the UK, 12% from the USA, 10% from Czech Republic, followed by Norway (2 people), New Zealand, India, Serbia, Belgium, and the Netherlands (1 person each). The survey also inquired into their frequency of museum visits and whether they have visited any museum focused on water transport (32 yes, 20 no). As for visited water transport museums, most often mentioned were museums in the UK (12, mainly National Museum of the Royal Navy in Portsmouth, Royal Museums Greenwich in London, Riverside

[9] Hamaker, C. and Pederson, M. Tools for Interactive Inspiration. In: Wood, E. (ed.) *A New Role for Museum Educators. Routledge*, 2023, p. 106-108.

Museum in Glasgow), US (7, e.g. National Museum of the United States Navy (DC) or various battleships), Sweden (3, mainly Vasa Museum), and Estonia (2, Estonian Maritime Museum, Tallinn). Denmark, Norway, Australia, New Zealand, Bulgaria, Greece or Spain also got one mention.

When asked about their opinion on interactives in museums, 47 respondents like to see them and also interact with them, while 2 like to see them but do not interact, and for 2 it depends on the type of interactive. Respondents also commented on the fact that interactives improve visitor experience and should not be only for kids as they can make a museum visit more memorable. Several respondents also stressed the importance of proper maintenance and the need to support the main idea of the exhibition since they should always have an educational element. Respondents also agreed on the fact that interactives do not have to be all about modern technology, appreciating creative solutions. As for favourite types of interactives, most mentioned were games; quizzes/contests/riddles; tactile elements; immersive elements; VR/AR (7 times each). These were followed by touch screens (5 mentions), video/audio content; models; demonstrations (4 mentions each), mechanical interactives (3 mentions); and interactives using all senses (2 mentions). Next question asked what interactive elements they think fit well with the topic of ship / water transport museums. As can be seen from Table 1, three most associated categories were tactile elements (38 respondents), games (34 respondents), and new technologies (AR/VR, 33 respondents). These were followed by touchscreens (29), kids' trails (28), multisensory elements (27), reenactions (25), interactive quizzes (23), and audio guides (22). Least associated were dramatized tours (16) and worksheets (10).



I also asked about museum visits that were made memorable thanks to interactive elements. To include just a few examples:

"*Audio visual displays, dressing up, object handling*. *Royal Navy Museum also included basic computer games as well as an interactive on positioning a sailing ship to make best use of wind*." (R2)

"*Thunder Bay National Marine Sanctuary has a replica ship inside that you can crawl through*." (R5)

"*At the New Zealand Maritime museum they had an interactive where you could crank the mainsail over as they do in the America's cup boat and compare your time to complete it to others and the crew*." (R8)

"*In arctic museum in Tromsø there were many monitors with extra information, you could just use headphones... or lot of stuff to touch or technology which measures the level of sounds and projectors which show the aurora*." (R24)

"*One maritime museum had a mock tattoo parlor set up with a machine projecting different sailor tattoos getting added on your arm, with an audio component about the legends behind the tattoos! I would also say all of the Exploratorium in San Francisco*." (R29)

For the museum survey, I reached out to 40 ship / water transport museums around Europe and I also published the survey on social media in museum professional groups. In the end, I received 22 responses (7 from the UK, 3 from Germany, 2 from Hungary, 2 from Sweden, then 1 from Austria, Serbia, Estonia, Poland, Spain, Finland, USA, Mauritius). Contacted museums ranged from small institutions to huge, based on both the visitor and employee numbers (the number of full-time employees ranged from 3 to 270). All of the museums except for one are situated close to a body of water. In this survey, I also focused on the topic of museum education and based on the responses I found out that only one of the museums does not have a museum educator, though they are planning on adding the function. The number of educators varied from 2 – 40, but mostly 3-7. All museums use interactives, most also offer educational programmes and have a designated space for them. 64% create the interactives by both outsourcing the production and in-house. When asked about their main target audiences[10], almost all selected younger children aged 6-11 (21 responses) and families with children (20 responses). Primary education and secondary education school groups constitute main audience for 17 and 12 institutions, respectively. The least selected categories were young adults aged 18 to 27 (9 responses) and pre-schoolers (10 responses). These numbers might indicate a hidden potential for future development. Two museums also added disabled visitors (blind and deaf) to their target audiences.

Final part of the survey focused on the interactive elements used, dividing them into two categories – physical interactives (Table 2) and digital interactives (Table 3). The

[10] Museums could select more than one category.

most used interactives were videos and animations (21), hands-on elements, touch screens and interactive kiosks (20), audio content (18) and lift-up panels and drawers (17). Among the least used interactives there were augmented reality and interactive webpages (both 6), virtual reality (7) and smelly boxes (8). The main reason given for this (especially when it comes to modern technologies) was the high initial cost and problems with subsequent maintenance, as these interactives have a tendency to break down. There were also some other mentioned issues, such as easily breakable interactives, complicated user interface, constant need for upkeep / updating of modern technologies, visitor mobility issues in museums ships, or complications stemming from changes in temperature and humidity.

hands-on, tactile elements	20
mechanical exhibits	12
lift up panels, sliders and drawers	17
smelly boxes	8
games and quizzes	16
play areas for kids	15
interactive tours	10
interactive models	11
worksheets	15
Other	2

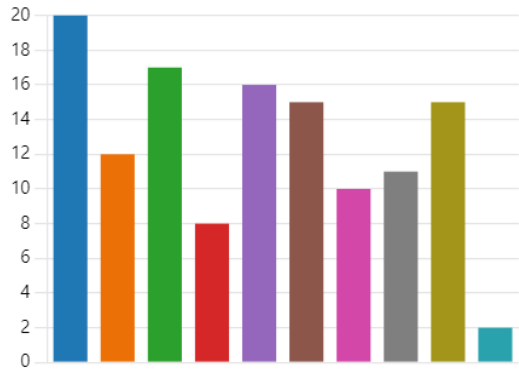


Table 2 – Physical interactives

audio content in exhibitions	18
audio guides	12
videos and animations	21
touch screens, interactive kiosks	20
games and quizzes	12
QR codes	14
virtual reality	7
augmented reality	6
interactive webpage	6
Other	2

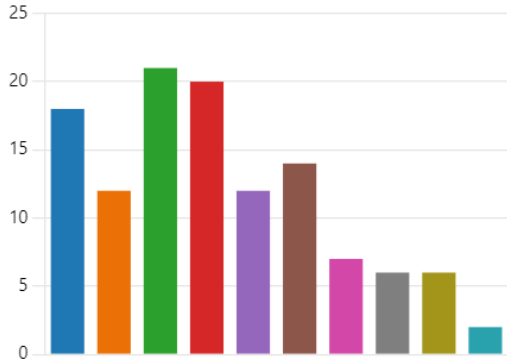


Table 3 – Digital interactives

I also asked about interactives that work well for their institutions. To include just a few more specific examples:

"*We have a Waterways Room that lets guests "sail" small model boats down "rivers" and learn about water pressure, wind, locks, dams, and more. People of all ages love to spend time just playing in the water*." (R1)

"*Two big augmented reality monitors which evoke and explain the original machinery (steam engine, water pumps) in the (now empty) power station of the ship lift*." (R5)

"*That is a videogame in which you can make your own boat on a shipyard. We have it on two floors (the easier and harder version)*." (R10)

"*Fire interactive - young children put out tenement blazes while operating a fireman's crane and hose*." (R13)

"*A sandbox with an interactive projection of a topographic map-the sand is manipulated and the projection demonstrates how rivers are formed*." (R15)

"*Minecraft relating to HMS Victory*." (R16)

If we compare the most used interactives with those the visitors found most fitting for water transport museums (Table 4), the biggest difference is in the use of virtual and augmented reality (used by 30% of museums, but ranked 3rd most suitable by visitors (63% of respondents)) and the use of worksheets (used by 68% of museums but ranked the lowest by visitors (18% of respondents)). From the visitors' perspective, this might stem from the fact that the biggest group of respondents were younger adults between the age of 25 and 34 who are more familiar with modern technologies and are not the usual target audience for worksheets. From the museums' point of view, the biggest obstacle in installing these technologies are aforementioned finances and maintenance, while worksheets are relatively cost-effective and easy to create. Moreover, worksheets are also among the most used interactives[11] in museums nowadays.

[11] Mrázová, L. *Tvorba pracovních listů*. Brno, 2013, p. 4.

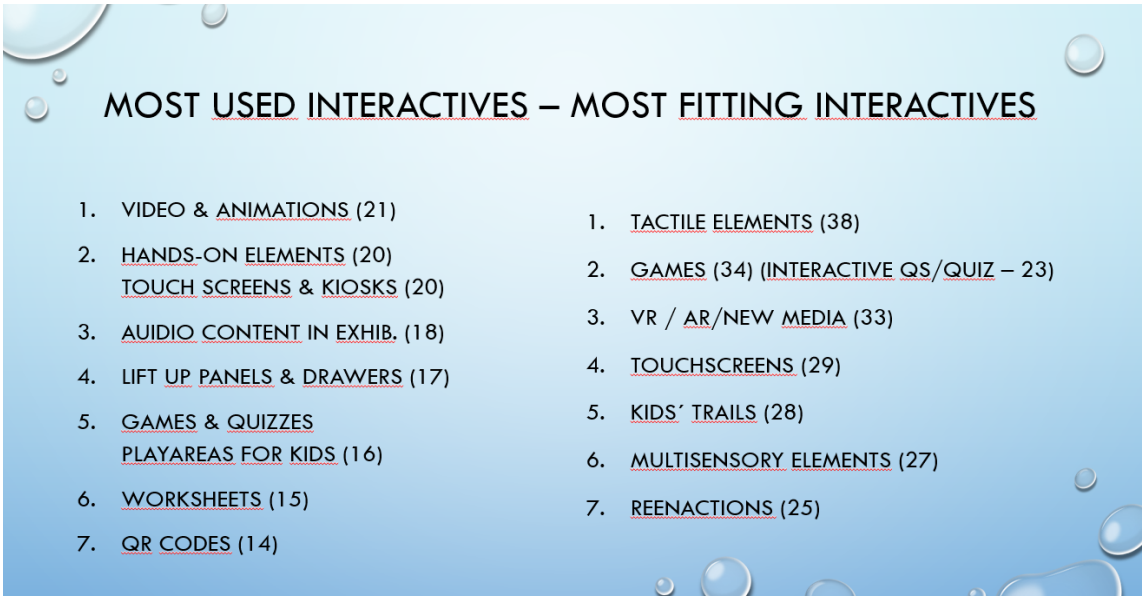


Table 4 - Comparison

As the sample of respondents both from general population and museums was relatively low, it is not possible to draw comprehensive results. However, I still consider the surveys an interesting probe into the opinions and practice of both museums and their visitors, with inspirational examples as well as highlights of issues that need to be addressed. Therefore, I would like to continue with – and also expand – this line of research in the future.

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Efforts to establish a Museum of Water Transport in Bratislava[1]

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Abstract

Collections related to water transport are found in all Slovak museums whose collection area is in regions related to water transport. These are not complete collections, rather individual objects. The predominant items are related to rafting. Basic information about water transport in Slovakia is available at the Museum of Transport in Rajecké Teplice. In 2013, a specialised exhibition was opened in Rajecké Teplice in the railway station building, which brings closer the history of individual modes of transport, including water transport. The history of transport, including water transport, in the Central Slovak region, with an emphasis on the Pohronie region, is currently presented in a part of the new exhibition of the Central Slovak Museum in Banská Bystrica under the title Transithistory, i.e., a journey through history, the history of trade and travel. In 2013 the Slovak Technical Museum acquired the tugboat Šturec built in 1937 in Komárno. Currently, the STM-Museum of Transport in Bratislava is trying to establish a specialized exhibition of the Museum of Water Transport in the Winter Port in Bratislava.

Keywords : shipping, rafting, exhibition, museums

Rivers are one of the main lines of communication along which people have migrated since the beginning of mankind. Over time, people have also harnessed the power of the watercourse to transport goods by means of vessels. Water transport on the territory of today's Slovakia has been documented through material evidence since the 4th-3rd century BC. It is represented by the torso of a Celtic boat, which is now located in the Žitnoostrovské múzeum in Dunajská Streda.[2] Navigation during the time of the Roman Empire, when its frontier ran along the Danube, is evidenced by Roman anchors found near Komárno. In the summer of 2022, people living along the Danube could see a working replica of a Roman rowboat, which set sail from Ingolstadt, Germany, on

[1] The study was carried out under the framework of a grant VEGA No. 1/0689/22 Czechoslovak cargo and passenger transport along the Danube River in the 1970s and 1980s.
[2] BARTA, P. – SLÁDEK, J. – HAJNALOVÁ, M. – NAGY, I. Monoxyl z doby laténskej zo Šamorína. In *Musaica archaelogica*, 2020, No. 2, pp. 79–86.

16 July and reached the Black Sea at the end of November. Until October 2024, the vessel was located at the Mušov dam in the cadastre of the village of Pasohlávky, where there is also an important site from the Roman Empire. From October 2024 to June 2025 the vessel will be based in Bratislava.[3] In the village of Mikulčice in the Czech Republic, near the Slovak border, the torsos of boats made of a single piece of wood – log boats – were found in an extinct branch of the Morava River, dating back to the 9th century.[4]

The long-term aim of the Transport Museum is to make a specialised museum exhibition focusing on the field of water transport available to the public. In this way, the museum wants to repay its debt and to match other towns with a shipping tradition that already have such an exhibition.[5] In my paper I present how the field of water transport in Slovakia is documented and presented through collections of objects from the field of water transport. However, I must admit that only marginal attention has been paid to this area. We can talk about more systematic collecting activities only since the second decade of the 21st century in the context of the STM-Museum of Transport in Bratislava.[6]

Rafting

The most widespread type of water transport in Slovakia was rafting – floating timber from the mountain areas of the then Hungary primarily to the capital city – Budapest.[7] It probably took shape shortly after the foundation of Hungary in the 11th century and disappeared in the 1940s. The development of the railways from the second half of the 19th century onwards meant the gradual decline of this profession, which was not able to compete with the railways in terms of speed of transport of goods or price. Today, this tradition is documented by the depiction of raftsmen in folk art and the development of rafting in tourism.

Museum documentation and presentation of water transport in Slovakia

Collection objects related to water transport are found in all Slovak museums whose collection area is in regions related to water transport. These are not complete collections, rather individual objects. The predominant items are related to rafting: carpentry items related to the manufacture of rafts or raftsmen's clothing. There are many photographs of rafting in the first half of the 20th century and of recreational rafting in the post-World War II period. The Museum of the City of Bratislava and the Danube

[3] MUSILOVÁ, M. Danuvina Alacris, plavba rímskej veslice v rámci projektu Living Danube Limes v roku 2022. In *Historické dopravné stavby na území Bratislavskej župy*. Bratislava : BSK, 2023, pp. 168-178. For more on the production of the ship see for example: https://www.youtube.com/watch?v=a1l3laYExww;

[4] ROGERS, J. S. Czech logboats: early inland watercraft from Bohemia and Moravia. In Sborník prací Filozofické fakulty Brněnské univerzity / *Studia minora facultatis philosophicae universitatis Brunensis*, M 16, 2011, pp. 189-195.

[5] VARGOVÁ, L. Európske múzeá vodnej dopravy / European museums of water transport and DOLÁK, J. Muzea lodní dopravy jako možná inspirace / Shipping museums as possible inspiration. In Kačírek, Ľ. (Ed.). *História Dunajplavby – vodná doprava na Slovensku / History of Dunajplavba – Water transport in Slovakia. Košice* : Slovenské technické múzeum, 2024, pp. 45-55 and 56-62.

[6] MARÁKY, P. Dopravné múzejníctvo – stav, potreby a možnosti. In *Múzeum*, 2014, Vol. 60, No. 3, pp. 6-8.

[7] More for example: POLONEC, A. *O pltníctve na Slovensku*. Turčiansky Sv. Martin : SNM, 1944, 32 p.; HUSKA, M. A. *Slovenskí pltníci. Život, práca a kultúra slovenských pltníkov*. Martin : Osveta, 1972, 294 p.; JANTO, J. *Pltníctvo v tradičnej kultúre na Slovensku / Rafting in traditional culture in Slovakia*. In Kačírek, Ľ. (Ed.). *História Dunajplavby – vodná doprava na Slovensku / History of Dunajplavba – Water transport in Slovakia. Košice* : Slovenské technické múzeum, 2024, pp. 37-44.

Museum in Komárno also preserve objects associated with the beginnings of modern navigation on the Danube in the 19th century.

Basic information about water transport in Slovakia is available at the Museum of Transport in Rajecké Teplice. The museum is a specialised exhibition of the Považské Museum in Žilina. Since 1964, the museum has specialised in documenting the history of transport in Slovakia. However, it did not really deal with this area. It was not until 1981, when its specialisation was narrowed to the field of railway transport.[8]

In 2013, a specialised exhibition was opened in Rajecké Teplice in the railway station building, which brings closer the history of individual modes of transport, including water transport.[9] The main milestones in the field of water transport, including pictorial materials, are presented on banners. The focus is primarily on the rivers Váh and Danube as the main transport arteries. There is also a model of a raft as the most widespread means of transport on Slovak rivers until the development of modern shipping. Although the area of water transport makes up the smallest part of the segment from the area of transport, dominated by rail and road transport, the visitor gets all the basic information about the important landmarks of this area of transport.

The history of transport, including water transport, in the Central Slovak region, with an emphasis on the Pohronie region, is currently presented in a part of the new exhibition of the Central Slovak Museum in Banská Bystrica under the title Transithistory, i.e., a journey through history, the history of trade and travel.[10] The Hron as a river route is part of the sixth stop. In this part of the exhibition, visitors can learn about the livelihood of some of the inhabitants who were engaged in logging and transporting wood along the watercourse, its further processing and wood products, as well as fishing. A separate banner also informs about rafting. The entire exhibition is bilingual – in Slovak and English, and thus accessible to foreign visitors.

Efforts to establish a specialised water transport museum

In 1988, in the pages of the magazine *Technické noviny* (Technical newspapers), we come across an effort to establish a specialised museum focused on the documentation of technical heritage, especially of shipping and water transport on the Danube. The exhibition was to be made available in the former warehouse building of the Danube Shipping Company, known as Warehouse No. 7. The authors gave following explanation: „*The building forms a traditional part of Bratislava's skyline, moreover organically linked to the Danube, the main formative element of the city, and linked to shipping, which has historically strongly shaped the character of this Danube city*." And they go on to explain that it is water transport „*that would also be perhaps the museum's strongest exhibition commodity*". Thus, according to the authors, „*there is a*

[8] MIČUROVÁ, M. *Doprava*. Edícia Fontes. Žilina : Považské múzeum, 2001, p. 7.

[9] ŠIMKO, P. Považské múzeum v Žiline – múzeum pre oblasť dejín dopravy na Slovensku (skutočnosť a vízie). In: *Ochrana pamiatok dopravy v rámci Slovenska. Zborník príspevkov z odborného seminára pri príležitosti 10. výročia otvorenia Múzea dopravy Bratislava 2009.* Košice : STM, 2010, p. 18.

[10] Nová stála expozícia Stredoslovenského múzea v Thurzovom dome, Banská Bystrica. In: https://www.archinfo.sk/diela/rekonstrukcia-a-obnova/nova-stala-expozicia-stredoslovenskeho-muzea-v-thurzovom-dome-banska-bystrica.html [Cited by 11. 06. 2024]

natural opportunity to use the waterfront environment for large-scale exhibits – boats and related equipment".[11] The waterfront in front of the warehouse building would also serve as a public harbour. The opening of the museum was to be part of the celebrations of the 700th anniversary of the granting of city rights to Bratislava in 1991. The Warehouse Building No. 7, built in 1922, was declared a National Cultural Monument in 1986. At that time, it was used by the Slovak National Theatre as a construction site for a new theatre building, which was to be opened to the public in 1992.

This paper generated quite a lively debate among both supporters and opponents of the proposal. Among the supporters of the museum were, for example, Capt. Peter Majerník, a teacher at the secondary shipbuilding school in Bratislava and the author of many papers on the history of shipping on the Danube, who suggested that the museum exhibition should include the river-sea motor freighter Bojnice, which was decommissioned in 1987.[12] In the *Technické noviny* of 1989[13] we can capture one more discussion, with both supportive and dissenting opinions. However, these ongoing efforts and the discussion about the need for a museum were overshadowed by political events – the regime change in 1989 shifted the attention of the population to other issues, and the *Technické noviny* itself also disappeared in the stream of social change.

The Kriváň Tugboat and Ship Museum

We had to wait ten long years for further efforts to establish a museum documenting the history of shipping on the Danube. In 1999, the civic association West and the civic association Devínska brána acquired the tug Kriváň for one Slovak crown from its original owner, the company Slovenská plavba a prístavy.[14] The establishment of a museum was among the conditions of its acquisition.[15] The tugboat was built in 1954 at the Komárno Shipyard.[16] The Ship Museum was thus to combine the genius loci of the vessel with an exhibition presenting the history of shipping on the Danube. The museum was officially opened on 1 May 2001.[17] However, the ship was mainly used as a restaurant, social events were held here and there was never an officially registered museum. In 2010, the vessel was rebuilt and its heritage values were irreversibly destroyed. As the vessel was not registered on the National Register of Historic Places, its owners suffered no financial penalty and the former shipowners and shipwrights could only watch helplessly as their 10-year effort was destroyed without compensation.[18]

[11] KUBÁČEK, J. – POCHÁZKA, K. Budeme mať Slovenské národné technické múzeum? In *Technické noviny* (further TN), 1988, Vol. 36, No. 52, p. 21.
[12] MAJERNÍK, P. Slovenské národné technické múzeum pre Bratislavu. In TN, 1989, Vol. 37, No. 8, p. 15.
[13] Bude? Nebude? (Slovenské národné technické múzeum). In *TN*, 1989, Vol. 37, No. 15, p. 9.
[14] Slovak Television made a documentary film about the ship Kriváň and the efforts to use it for museum purposes back in 1990. Available at: https://www.youtube.com/watch?v=BaYzijBVslo.
[15] https://www.sme.sk/c/2187368/remorker-krivan-predali-za-korunu.html [Cited by 05. 06. 2024].
[16] BOHUNSKÝ, J. – PUHA, K. *Dunajská flotila. História lodného parku od roku 1922*. Bratislava : Slovart, 2012, pp. 88-91.
[17] https://noveslovo.sk/c/21246/O_zivote_lodnikov_v_remorkeri_Krivan [Cited by 05. 06. 2024].
[18] For more information: https://bratislava.sme.sk/c/5897434/z-lode-za-korunu-je-klub.html [Cited by 05. 06. 2024].

Tugboat ŠTUREC

The destruction of the tug Kriváň caused great outrage not only among the shipbuilding community, which, after overcoming the initial shock, looked for other ways to achieve its goal. Their interest turned to the tug Šturec. The tug was built in 1937 at the Škoda Works in Komárno as the MTL ŠTÚR and originally served as an oil tanker. In June 1944, it was damaged and sunk during the bombing of the Apollo refinery in Winter Harbour. After the war it was converted into a tug and renamed ŠTUREC, decommissioned in 1984 and it was laid up in the northern basin of the Winter Harbour for 30 years.[19]

In order to avoid the fate of Kriváň, the first step was to prepare documents for the declaration of Šturec as a national cultural monument, which was completed on 5 January 2012. The justification of its monumental values was prepared by the shipbuilder Mr. Juraj Bohunský. The owner of the vessel was the Slovak Water Management Company and the shipowners, represented in the professional association Slovak Navigation Congress, were looking for partners who would ensure its gradual restoration and presentation to the public. Thanks to the support of the STM management and the initiative of the then director of the STM-Museum of Transport P. Maráky, the Šturec was gratuitously transferred to the STM collection in 2013. Thanks to the support of the company Slovenská plavba a prístavy, a. s., the tugboat was placed on the unused part of the ship lift in the Winter Harbour and its gradual restoration began.[20]

Thanks to the voluntary activities of the boatmen, the professional association Slovak Navigation Congress – OS Šturec and also Klub ochrany technických pamiatok OZ (KOTP – Club for the Preservation of Technical Monuments, citizens association), financial and technical support of Slovenská plavba a prístavy, a. s. (SPaP – Slovak Danube Shipping Company, stock company) and priority projects of the Ministry of Culture of the Slovak Republic, Šturec has acquired its present form and since 2017 it has been regularly opened to the public on special occasions - in June within the framework of the Sunrise on the Danube event or in September within the framework of the European Cultural Heritage Days. Visitors can thus learn about the history of the vessel, the course of its gradual restoration, as well as the operation in the harbour. A great bonus is the participation of shipwrights and shipbuilders, many of whom also worked on the vessel itself, who bring their memories to the visitors.

It is the tugboat Šturec that is at the origin of the building of the collection of water transport in the STM-Museum of Transport in Bratislava and the effort to establish a specialized exhibition of the Museum of Water Transport in the area of the Winter Harbour in Bratislava. You will learn more about these efforts in the following papers.

[19] BOHUNSKÝ – PUHA, ref. 16, pp. 70-72.

[20] For more information for example: DUBINY, M. The harbour of Bratislava – International contexts. In P*rocedia Engineering [electronic resource] : World Multi disciplinary Civil Engineering Architecture-Urban Planning Symposium 2016*, WMCAUS 2016. Praha, ČR, 13. – 17. 6. 2016. Vol. 161, (2016), online, pp. 2104-2108; DUBINY, M. – MACKOVIČOVÁ, K. – KRÁĽOVÁ, E. Revitalisation of harbour structures trough their cultural values – the example of the winter harbour in Bratislava. In *7th international conference on industrial heritage. Torpedo-History and Heritage. Rijeka, 19.-21 May, 2016*. Rijeka : Pro Torpedo, 2016, p. 28; DUBINY, M. – MACKOVIČOVÁ, K. Interdisciplinary cooperation in the protection and development of the harbour as industrial heritage. In *Challenges, Research and Perspectives = Herausforderungen, Forschung und Perspektiven : 2016*. Berlin : Uni-edition, 2017, pp. 356-367.

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Image attachment

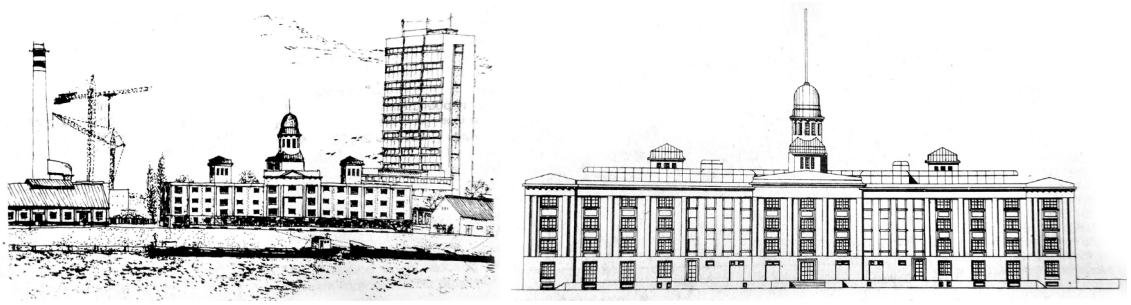

Fig. 1: Warehouse No. 7, drawing from 1988. In *Technické noviny*, 1988, Vol. 36, No. 52, p. 21.

Fig. 2: The Tugboat Kriváň – original appearance, 2000. Source: sandorde.webgarden.cz

Fig. 3: The Tugboat Kriváň – current state. Source: ePhoto.sk

Fig. No. 4: Source: Tugboat Šturec in 2014 and 2019.
Photo archive of STM-Museum of Transport

Preparation of the Museum of Water Transport exhibition on the ŠTUREC tugboat

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Abstract

The article describes the preparation of documents that will be used in the preparation of exhibitions on the ŠTUREC ship. The preparation itself is carried out simultaneously with the reconstruction of the ship. During this reconstruction, suitable exhibitions are designed that will present the life of boatmen on a boat and the history of water transport in Slovakia.

Keywords: exhibition, tugboat

We acquired the historical tugboat ŠTUREC[1] for the museum in a found condition (incomplete condition), therefore, even before installing the exhibitions in the ship, a complete reconstruction of the ship was also necessary. The reconstruction of the ship ŠTUREC began in 2014 by pulling the ship onto the slipway in the Winter Port. At the beginning of the project, Ing. Jiří Mandl and Juraj Bohunský and Capt. Vladimír Novák (members of the ŠTUREC expert group at the time)[2] participated to a large extent in the implementation. They proposed a project for the overall renovation of the ship, which they divided into individual stages. Ing Jiří Mandl, as a former ship designer, proposed in the first stage of the priority project part of the reconstruction work on the ship, which was carried out in 2015. The technical solution of lifting the ship onto the slipway and placing it on the original beams from the slipway was among the first steps that we carried out in 2014. During the renovations, we also simultaneously dealt with proposals for exhibitions in individual cabins, what kind of exhibits and where they should be located. Two years later, a proposal was made to open the ship to the public on a trial basis and to test its operation in limited conditions. During the several years when we made the ship available to the public, various solutions for making the ship available were tried, and errors were found in the overall plan of the ship's operation for the public. My first draft of the exhibition was created in 2016, when together with Ing. Jiří Mandl and Ing. Erich Píš we developed the first proposal of the concept of the future museum's functioning. I gradually expanded the proposal with other thoughts and ideas.

[1] GODUŠ, Martin: Remorkér ŠTUREC, Slovenské technické múzeum, Košice, 2020.
[2] Expert group ŠTUREC at the Slovak Navigation Congress, a group dealing with the first activities of the acquisition and renovation of the NKP Tugboat ŠTUREC

National Cultural Monument - ŠTUREC tugboat lifted on the slipway in the Winter Harbour in Bratislava
Source: Archive of STM-Museum of Transport in Bratislava

Ing. Jiří Mandl came up with the proposal to place the museum in the space of the current Bratislava port, situated in the grounds of the former old shipyard in the Winter Harbour at the end of the southern pool, when they were dealing with the temporary storage of the ship ŠTUREC on the slipway due to the reconstruction of the ship. But also, on the basis of the gradual initiative of enthusiasts and the monument office, the idea of creating a museum in the Winter Harbour began to be implemented. They gradually began to declare technical landmarks in the Winter Harbour as technical monuments. The first four technical national cultural monuments were declared:

- the slipway that was manufactured and built by the Hitzler company from Rezno (Regensburg) in the 1930s,
- the ship hall, which was started to be built in the 1940s and was completed after the Second World War and was used for the repairation of vessels placed on the slipway,
- the ŠTUREC tugboat, which is located on the mentioned slipway, on the beams from the original historic slipway carts,
- the boatmen's house, which evokes the command superstructure of a ship with its architectural shape, originally served as a dormitory for boatmen, later as an opera tional administrative building of ČSPD, n. p., later SPD, š. p. and today SPaP, a. s.

Objects declared later:

warehouse No. 14, built in the 1920s, it was used for transshipment and storage of goods, currently it is rented out to private companies[3],

warehouse No. 17, built in the 1920s, it was used for transshipment and storage of goods, it is currently used for private companies[4],

ship crane No. 14, a second-generation crane built by Královopolské strojirny Brno and located near warehouse No. 14, is used for transshipment of goods in grain form[5],

ship crane No. 15, a second-generation crane built by Královopolské strojirny Brno and located near warehouse No. 14, is used for transshipment of goods in grain form[6],

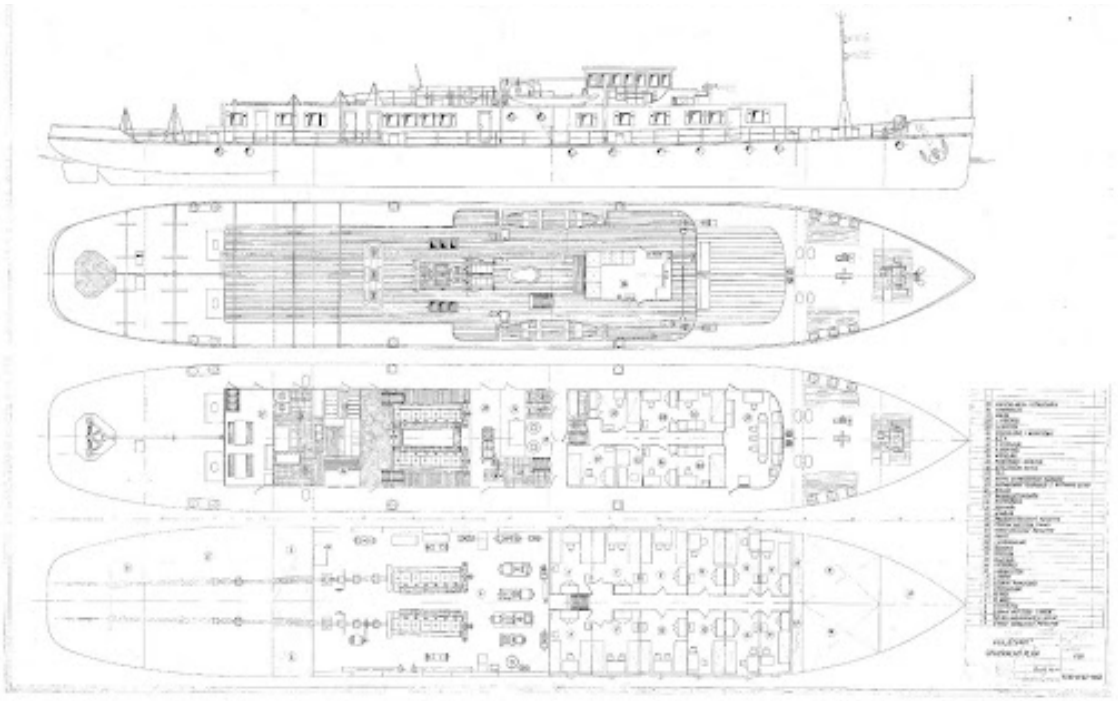
the southern pool, built between 1897 and 1907, was originally used for overwintering ships, later also year-round, when vessels were repaired on the slipway; currently it is used for the transshipment of bulk goods (coal and iron ore) and for the mooring of harbour tugs Muflón,

the northern pool, built between 1897 and 1907, was originally also used for overwintering ships, later for mooring and maintenance for passenger ships, currently serves for passenger vessels and vessels of Slovenský vodohospodársky podnik (the Slovak Water Supply Company)[7].

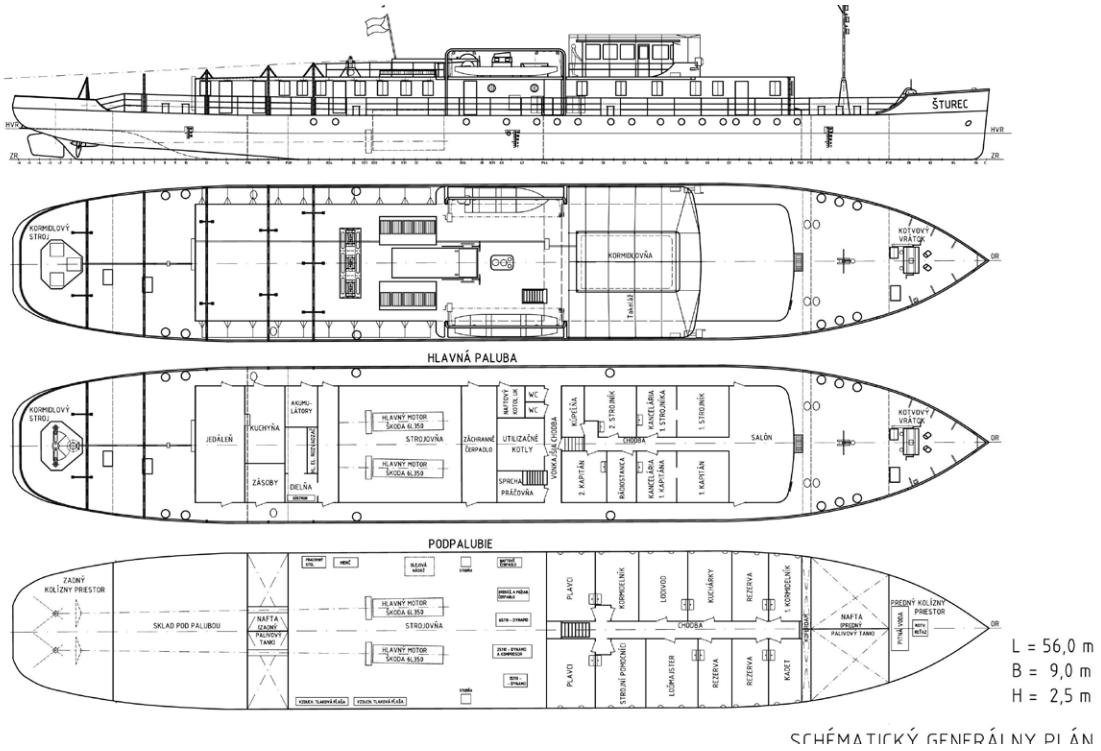
As a whole, this territory represents the values of the cultural and technical heritage of our republic.

It is divided into the ŠTUREC tugboat, which is located on the slipway, and the Ship Hall. All three objects are declared national cultural monuments. All of them are considered to be part of the area of the future Museum of Water Transport. They represent the history of shipbuilding in Bratislava and Slovakia. The proposal for the solution of the main exhibition space - Ship Hall - was developed by Ing. Jiří Mandl together with the students of the Maritime University and in cooperation with the Club for the Protection of Technical Monuments represented by Ing. Jakub Ďurinda. It is a former repair yard with a no-through road, it is a connected part of the slipway. The ship hall, after the overall structural reconstruction, will serve as a permanent building for exhibition and representation purposes. The exhibition building will also include spaces for restoration workshops, a depository and others. Especially for the needs of exhibitions of water transport. The ship hall will also include a documentation centre, where there will be publications, periodicals and various documents from the history of water transport.[8] In my work, I focused on the ŠTUREC tugboat

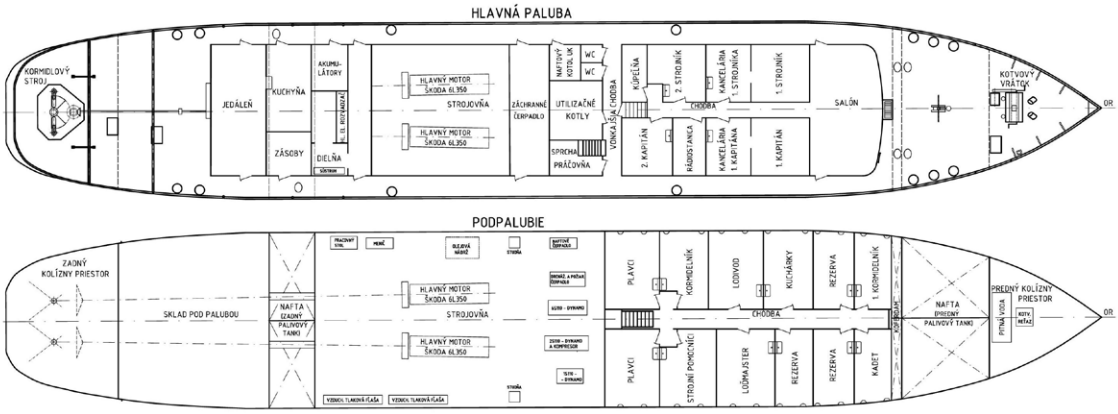
[3] Návrh na vyhlásenie nehnuteľnej veci za národnú kultúrnu pamiatku, Krycí list pre národnú kultúrnu pamiatku, PUSR-2017/7802-7/102063, s. 2
[4] Návrh na vyhlásenie nehnuteľnej veci za národnú kultúrnu pamiatku, PUSR-2017/7802-9/102067, s.6
[5] Návrh na vyhlásenie nehnuteľnej veci za národnú kultúrnu pamiatku, Krycí list pre národnú kultúrnu pamiatku, PUSR-2017/7802-7/102063, s. 37
[6] Návrh na vyhlásenie nehnuteľnej veci za národnú kultúrnu pamiatku, Krycí list pre národnú kultúrnu pamiatku, PUSR-2017/7802-7/102063, s. 37
[7] Návrh na vyhlásenie nehnuteľnej veci za národnú kultúrnu pamiatku, PUSR-2017/7802-6/102062, s.
[8] Goduš, M., Mandl, J., Píš E.: Koncepcia vzniku Múzea vodnej dopravy v Bratislave, STM-MD, Bratislava, 2020, s. 4



General plan of ŠTUREC tugboat from 1962
Source: Archive of STM-MD in Bratislava



Schematic general plan of ŠTUREC tugboat (2020)
Source: Archive of Jiří Mandl

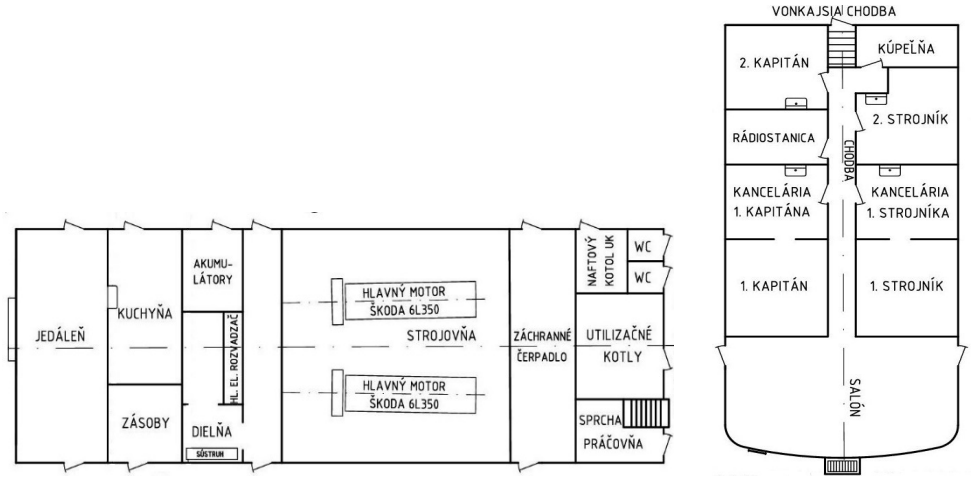


ŠTUREC tugboat - superstructure and below deck
Source: Archive of Jiří Mandl

The proposal for the division of exhibitions on the ship into two parts:

The proposal for the exhibition entitled “Life on a boat” will be located in the superstructure of the ship, where the cabins will contain the ship’s period equipment and exhibits from the life of boatmen, as well as the period’s small relevant inventory. This exhibition will be located in the cabin part of the superstructure and also in the wheelhouse. In order to compare the historical condition of the ship, a model of the motor tanker ŠTÚR will be placed in the ship salon, which will present the first design solution of the vessel during its operation in the years 1938 - 1944.

Cabins in the superstructure for the Life on a boat exhibition:



Superstructure of the ŠTUREC tugboat. Desing of ship spaces for museum purposes
Source: Archive of Jiří Mandl

1. **Ship salon**: period ship furniture, daily necessities and exhibits
2. **Captain's cabin**: period equipment, captain's daily necessities
3. **Engineer's cabin**: period equipment, daily necessities of the engineer
4. **Radio stations**: radio station and related equipment
5. **Ship's galley**: contemporary kitchen equipment
6. **Ship's dining room**: period equipment
7. **Ship's bathroom**: period equipment
8. **Engine room**: period machinery
9. **Food storage:** period fridge repository and food shelves

Permanent exhibition „Life on a Boat"

Ship salon
Source: Archive of STM-MD in Bratislava

Radio stations
Source: Archive of STM-MD in Bratislava

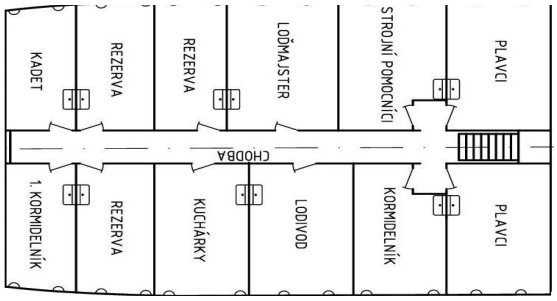
Engine room (current state before restoration)
Source: Archive of STM-MD in Bratislava

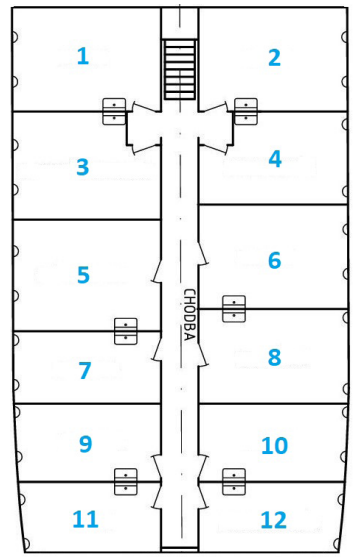
Wheelhouse with equipment, control and navigation devices

Steering stand with steering wheel
Source: Archive of STM-MD in Bratislava

The exhibition entitled “History of water transport” will be located in 10 cabins in the hold of the ship. It will contain exhibits from the history of water transport, namely various mock-ups of vessels, preserved original artifacts from other ships, such as ship’s bell, steering wheel and others. At the same time, maps, flags, paintings with a ship theme, mannequins in uniforms representing individual functions on the ship and others will be presented. The distribution of cabins will be according to individual sections in the history of water transport and according to the distribution of vessels, e.g., History of water transport before steam, Port of Bratislava, History of maritime transport under the Czechoslovak and Slovak flags, vessels built in Slovakia in Komárno and Bratislava and others. One period should be represented in each cabin.

Proposed distribution of cabins for the Water Transport exhibition:





1. History of water transport on the Danube for steam-powered ships (sailboats)
2. The beginnings of steam navigation on the Danube
3. Freight transport (steam, later motorised)
4. Passenger transport (steam, later motorized, depending on the purpose: sightseeing and excursion)
5. Transport in Bratislava
6. Port of Bratislava
7. History of maritime transport under the Czechoslovak and Slovak flags
8. Shipbuilding in Slovakia
9. Raft on Slovak streams
10. Hydraulic structures on the Danube and other streams in Slovakia
11. + 12. deposit

The history of water transport on the Danube before the period when ships were powered by a steam engine (sailboats)

Presentation of the history of water transport on the Danube from the beginning until 1830, when a regular line on the Danube was introduced, connected with the event when the first ship powered by a steam engine set sail in 1818 (CAROLINA).

The beginnings of steam navigation on the Danube

This period will be represented by vessels that were powered by a steam engine, passenger ships, cargo ships and technical vessels such as steam bucket-chain dredger. From 1818 to 1922.

Freight transport (steam, later motorised)

In this part, there will be a presentation of the shipping company, vessels and ship equipment used in cargo transport in the period from 1922 to the present. The first steam tugboats (SVATOPLUK, DYJE and others), the first cargo ships (DEVÍN, NITRA, HRON and VÁH), motor side paddle-wheel tugboats (PRESIDENT T.G. MASARYK, GENERAL M.R. ŠTEFÁNIK and others), tow and pusher motor tugboats (ŠTUREC, DARGOV, TELGART, ORLÍK, RUŽÍN and others).

Passenger transport (steam, later motorized, depending on the purpose: sightseeing and excursion)

This chapter will present the vessels and marine equipment used in passenger transport between 1922 and the present. The first steam passenger ships (OREL, SOKOL), motorized passenger ships (hydro buses), excursion passenger ships (BRATISLAVA, DRUŽBA).

Transport in Bratislava

It will present the history of the shipping (propeller) company, the company's fleet (BRATISLAVA, DEVÍN, KAMZÍK).

Port of Bratislava

It will present the history of the ports of Bratislava and Komárno. It will be divided into the old port, Winter Harbour, Pálenisko port in Bratislava and Komárno port (port cranes, buildings and port infrastructure).

History of maritime transport under the Czechoslovak and Slovak flags

The period presented by seagoing vessels operated by the shipping company ČSPD, n. p. (BOJNICE, LEDNICE, KREMNICA, BANSKÁ BYSTRICA and others).

Shipbuilding in Slovakia

Shipbuilding in Slovakia will be presented, namely in Komárno and Bratislava. A detailed history of the Komárno Shipyard and then also of the Slovak Shipyards. Production of the company, what they built and for whom. The history of the shipyard as part of the shipping company will be presented for the Bratislava shipyard. In addition, education related to water transport in Bratislava and research that was carried out in a shipping company in the Bratislava shipyard will be presented.

Rafts on Slovak streams

The history of rafting wood on Slovak rivers will be presented, in the form of rafts.

Hydraulic structures on the Danube and other streams in Slovakia

In this chapter, the history of the construction of hydraulic structures in Slovakia will be presented. All realized and unrealized proposals.

Proposal of permanent exhibition „History of water transport“

Below deck cabin with sanitary facilities (current state before restoration)
Source: Archive of STM-MD in Bratislava

Next step will be the appropriate selection of text material for individual displays, as well as for information panels. The text is an integral part of the exhibition, even if it is not its dominant element. It will be necessary to appropriately choose the amount of text for panels, labels or signs in order to inform the museum visitor about the individual exhibits and their history. At the same time it is important not to discourage the visitors by the amount of text that could dominate the visual side of the exhibition[9].

[9] Douša, P.: Text ve výstavě, in: Múzeum 1/2008,

The exhibition on the tugboat ŠTUREC will present a comprehensive history of water transport in Slovakia, although mostly only in the form of text and image material and in a reduced form due to the small space capacity. This is the first proposal where the history of water transport would be presented only on the ship ŠTUREC. If the museum manages to acquire ownership of the shipbuilding hall, the proposed exhibition may be extended to include large-scale objects presenting the history of water transport.

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MANAGEMENT OF THE CONVERSION OF A NATIONAL CULTURAL MONUMENT ON THE EXAMPLE OF (BOAT) SHIPYARD HALL IN THE PORT OF BRATISLAVA

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Abstract

In the last decade, attention has been drawn to industrial areas, which remain some kind of "black holes" in the central zones of cities. In this case, it is a former building of the Shipping Hall, which has ceased to serve its original purpose. It is located in the oldest preserved part of the Bratislava Harbour - the Winter Harbour. Since 2015, the hall has been included in the list of national cultural monuments. It originally served as a repair shop for ship parts, later a garage (SDM), a warehouse and is currently awaiting its use or fate.

The conversion of the national cultural monument of the Shipping Hall in the port of Bratislava does not depend only on its structural and technical reconstruction and conversion to a different function than the purpose for which it was originally built. Utilization management becomes an important factor after the conversion is complete. The sustainability of the new function is very important and related to the good readiness of the project. During the process of preparing the project documentation of the conversion, a plan for the use of the object must also be prepared at the same time, to ensure the life of the entire project.

Keywords: management, ship hall, museum, water transport, port, Danube, Bratislava

Introduction

The Industrial heritage in our territory has come to the front in recent years because of positive conversions, but on the other hand also because of the large-scale demolition of whole industrial zones all over Slovakia. Many buildings or sites of industrial production from the 19th and 20th centuries find themselves almost in central zones as a result of urban development. Understandably, there is a discussion about their transformation for new development needs. In the former industrial zone of Mlynské nivy in Bratislava and today in the newly emerging urbanisation of the city, the reconstructed Pradiareň (part of the former Cvernovka factory) and Jurkovič's heating plant

are located. The building of the former Design factory is awaiting its redevelopment. Bratislava Harbour - part of the Winter Harbour – is near to this zone. It is the oldest preserved part of the Bratislava Harbour, which was built at the turn of the 20th century.

For more than 10 years, there has been an initiative to create a Museum of Water Transport in Slovakia, which would use the originally preserved harbour buildings in situ and present the extensive history of water transport and shipbuilding in Slovakia. The aim of the initiative of the STM-Museum of Transport in Bratislava, ship engineers, architects and other enthusiasts is to build the Museum of Water Transport in the premises of the Shipping Hall[1]. The building is a former ship repair workshop used in the past for repairing ship parts, located in the Bratislava Harbour. For this purpose, a working group has been set up to take a coordinated approach to the reconstruction of the building with a view to its future use and to ensure, not only in the preparation of the entire project, but also after the reconstruction is completed, its viability based on the management of the use of the building. An important step today is the acquisition of the building by the STM-Museum of Transport in Bratislava in coordination with the Ministry of Culture of the Slovak Republic. This would simplify further processes in the preparation of the conversion of the object itself.

Shipping Hall - past - present - future

The building of the Shipping Hall or Ship Workshop - under this name it was included in the list of national cultural monuments of Slovakia - was built in the 1940s. The building itself was constructed in two stages. In 1944 the port and the nearby Apollo refinery were bombed by the Allies. The hall was built on the site of the former colony (Fig. 1), in close contact with the ship's hoist built in the 1930s.

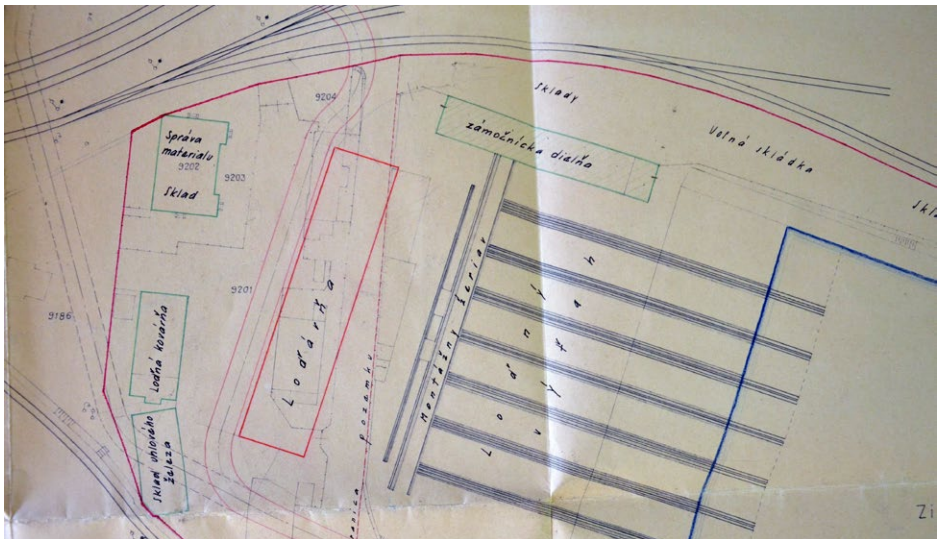

Fig. 1 Situation plan of the location of the Shipping Hall under the name "Lodárňa", 1940 [State Archive Bratislava, b. 8a, INV. no. 21]

[1] Shipping Hall is the correct name to use after consultation with the ship's engineers. The names used so far are mainly Ship's Workshop or Ship's Hall. The name Ship's Workshop was also used in the preparation of the proposal to designate the building as a National Historic Monument in 2014.

From the structural-technical point of view, it is a one-storey building of reinforced concrete frame construction with a wooden roof. One of the hall's unique features are the large-sized plate glass window panels in the west and east sections in the upper part, which were intended to bring in sufficient daylight needed for the repair of the ship's parts. It was later used as a garage (SDM) and store. In 2000, Act No. 338/2000 Coll. - Act on Inland Navigation and on Amendments and Additions to Later Regulations came into force, which brought a fundamental change to the property situation in the entire port area. The shipbuilding hall, together with the ship elevator, as monuments of industrial heritage were declared national cultural monuments in 2015. A few years earlier, an initiative to build the Museum of Water Transport in Slovakia in the Bratislava Harbour area had also been launched. The space in which the Shipbuilding Hall, the Ship Lift, on which the Tugboat ŠTUREC is grounded (Fig. 2) creates an in-situ document of the history of Bratislava as a port city. At the same time, the proximity to the city centre and to the emerging centre also referred to as Downtown on the territory of the former industrial zone Mlynské nivy and especially the former Apollo refinery creates the potential for a cultural function.

Fig. 2 (left) Shipping Hall with the ship elevator, on which is located the Tugboat ŠTUREC, photo: august 2022 © M. Goduš and (right) degraded roof of the Shipping Hall, photo: august 2023 © J. Mandl

The conversion of the historic building is essential and should consider the future functional use of the building. The building can then accommodate:

- the original function (if it can be returned),
- a new function (which is not present in the area),
- an extended function (which complements an existing function in the area).

If the Museum of Water Transportation in Slovakia is created on the premises of the Shipyard Hall, we can talk about a new function and a partial extension of the function in the surroundings. The museum represents a cultural function that would bring an additional cultural dimension to the area alongside the Slovak National Theatre. If we mention the extension of the function in the surroundings, the closest we have is the

Pumping Station from 1904-1905, which is owned by the BVS Water Museum, and on Plynárenská Street in the SPP premises there is the Slovak Gas Museum in buildings from 1936.

The present shows the urgency of proceeding with the conversion of the building, as the hall will lose its roof plane from the spring of 2023 (Fig. 2). The structural and technical condition of the building is not yet fundamentally impaired, but the postponement of the reconstruction in time may lead to an increase in the funds needed for the reconstruction.

Fig. 3 Situation of the Shipping Hall with connection to the surrounding development in the harbour and wider relationships, Museum of water transport Bratislava - conceptual plan, Overall situation and wider relations, 01/2022 ©, (1 – Tugboat ŠTUREC, 2 – Shipping Hall, 3 – Ship Lift, 4 – Pumping Station, 5 – worker's house of Pumping Station, 6 – old workshops, 7 – Transport Authority, 8 – old gatehouse ČSPD, 9 – Boatmen's house, 10 – southern pool of Winter Harbour, 11 – northern pool of Winter Harbour, 12 – crains, 13 – Warehouse No. 7, overpass/above the railway – possible entrance to the museum, the proposed museum site, NKP – national cultural monument)

The conversion of the Shipyard Hall is currently taking place in 3 basic levels:

- level of Working group,

- level of support,

- level of funding.

The different levels are interlinked or build on each other. At the same time, a preliminary schedule for the conversion of the building has been drawn up for the next period with an estimate of funds.

Level of Working group

The working group consists of STM-Transport Museum staff, ship engineers, architects and enthusiasts. They have been working on the planned future conversion for more than 10 years. However, work has intensified over the past year (2023). The main objective of the working group is to create a basic concept of the conversion of the Shipyard Hall for the needs of the creation of the Museum of Water Transport in Slovakia. The working group meets at least once every two months.

Basic objectives:

- *collection of documents for the museum,*
- *elaboration of the museum concept,*
- *coordination of the restoration of ships as collections for the future museum exhibition,*
- *seeking funding,*
- *seeking support for the establishment of the museum,*
- *management of the use of the building.*

The activities of the working group are dependent on the management of STM Košice and STM-Museum of Transport in Bratislava (STM-MD) and the financial resources that the museum may have at its disposal for the preparation of any documents for the Museum of Water Transport in Slovakia.

The Tugboat ZVOLEN was pulled out of the water last year (in 2023) and the Passenger speedboat Meteor V - BRATISLAVA in this year (2024). Together with the Tugboat ŠTUREC they belong to the collections of STM-MD, which are to be part of the exhibition of the future Museum of Water Transport in Slovakia.

Level of support

The search for support for the initiative for the establishment of the Museum of Water Transport in Slovakia has been ongoing for several years. Over the past years (2023 - 2024), it has been possible to obtain supportive opinions by passing resolutions through the councils:

- district of Ružinov,

- Capital City of Bratislava,

- Bratislava self-governing region.

The preparation of a letter of support from the ENoRM2 organisation is currently underway. This year (May 2024) a conference of ENoRM members was held in Bratislava, where the main representatives of the organisation expressed their interest in supporting the project of the creation of the Museum of Water Transport in Slovakia.

By summarising the supportive opinions, it is possible to ask for more support at the level of the Ministry of Culture of the Slovak Republic, which is currently underway, or at the level of the Government of the Slovak Republic.

Level of funding

The STM- Museum of Transport in Bratislava is a branch of the Slovak Technical Museum in Košice. Financial resources beyond the established budget of the museum must be communicated as a priority through the Ministry of Culture of the Slovak Republic (MK SR).

1) An investment plan in the form of a report was prepared for the Ministry of Culture of the Slovak Republic in August 2023 – Shipping Hall, Winter Harbour, Bratislava. Estimation of investment costs of the conversion of the Shipping Hall into the Museum of Water Transport. The investment plan was also included in the Inventory of Investment Plans of the Ministry of Culture of the Slovak Republic for the following years.

2) Charter of Support for the Museum of Water Transport - In autumn 2023 an information campaign was launched - Charter of Support for the Museum of Water Transport, through which it is possible to collect, in addition to collections for the future Museum of Water Transport, also suggestions for financial donations from the public and private sector.

3) Grant Scheme – Identification of a suitable grant scheme for the purposes of the Museum, taking into account the current property rights arrangements. It is the grant application process that is becoming complicated as the purchase of the Shipping Hall building is currently pending. All grant schemes are tied to property owned by the applicant. In the meantime, while the ownership relations are settled, there is also communication about the possibility of applying for Norwegian funds in the future.

In order to obtain any funding more quickly, the solution is to get the Shipping Hall into the hands of STM Košice, i.e., STM-Museum of Transport in Bratislava, which could prepare applications for funding from the relevant grant schemes. At present, it is not

[2] ENoRM - European Network of River Museums [https://enorm-online.eu]

possible for a public institution to apply for funding for a privately owned movable or immovable asset.

Preliminary conversion plan

The preliminary plan was part of the report to the Ministry of Culture of the Slovak Republic with regard to the current realities. The plan was divided into two main phases:

- *investment phase*
- *operational phase*

Investment phase

The investment phase foresaw a higher initial cost, which focused on the preparation of the conversion of the building and the construction and technical implementation.

1) **Ownership and legal relations** - resolution of the ownership of the hall
2) **The initiative to establish the Museum of Water Transport in Slovakia** - seeking support from the public and private sector
3) **Project documentation** - Architectural study - Documentation for planning permission - Documentation for building permit - Documentation for construction implementation
4) **Concept of the usability of the building** - Management of the use of the building after its opening, which provides for the setup of individual spaces for a clearly defined functional definition. It calculates the basic operating budget and payback.
5) **Exhibition of the future museum** - Creation of a concept and the beginning of the collection process. Points 4 and 5 are closely related and influence each other.
6) **Renovation of the building and surrounding area to ensure visitor safety**.

Operational phase

The operation of the museum has been planned from 2028, which envisages, in addition to the permanent exhibition of the Museum of Water Transport in Slovakia in the premises of the Shipping Hall and the Tugboat ŠTUREC, a space for temporary exhibitions, an auditorium for smaller social events, a small library or reading room and a café.

The preliminary timetable for the conversion of the Shipping Hall building is ambitious. However, with the cooperation of all concerned parties from the public and private sectors, it could be feasible.

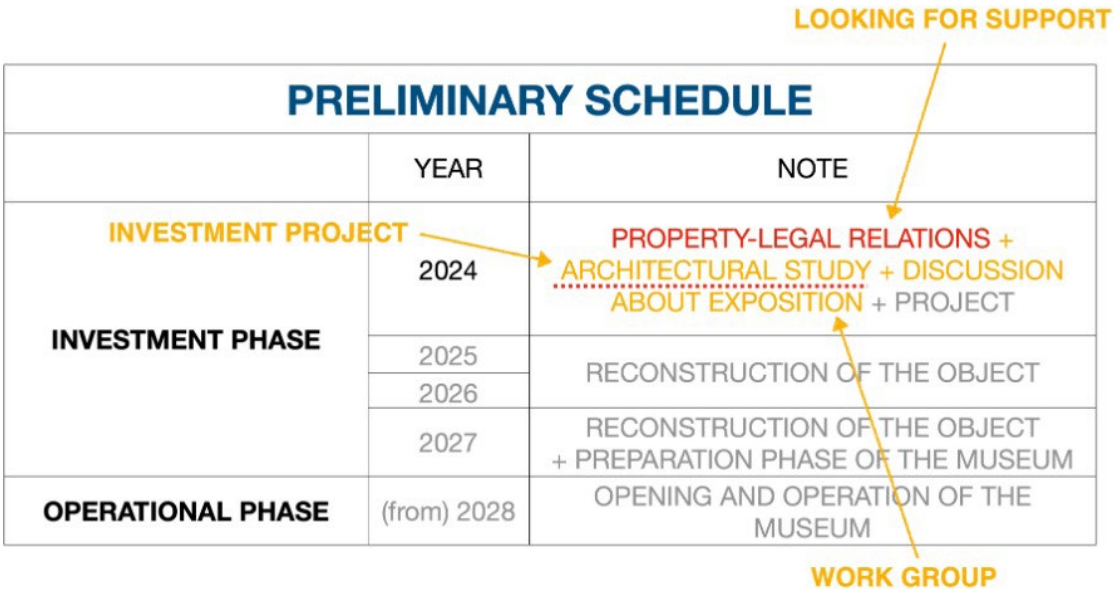

Fig. 4 Preliminary schedule of planned works, May 2024 ©

Access to the building

The Shipping Hall is located in the industrial area of the Harbour of Bratislava - part of the Winter Harbour, which is not accessible to the general public. Therefore, in the future, it is necessary to build a safe access for visitors and museum staff for the needs of the museum. For this reason, various alternatives of access to the building are being considered:

- *surface access* (access directly through the entrance gate and the harbour railway siding)

  advantages - barrier-free - easy surface access
  - lower costs

  disadvantages - security - increased security risk – the need to address road markings and warning signs

- *off-street access* (construction of an access footbridge over the railway siding and the harbour road together with a barrier-free solution)

  advantages - continuity - no crossing of port traffic with museum visitors
  - safety - safe and independent access due to not crossing traffic of the port

disadvantages - barrier - need to address the platform
- higher costs

For both approaches, it is essential to address the safe movement of the public as visitors to the future Museum of Water Transport in Slovakia, along the location of the harbour road, considering that this is a fully functional port operation.

Fig. 5 Solution of the access to the Shipping Hall and Tugboat ŠTUREC as a future Museum of Water Transport in Slovakia, (up) surface access, (down) off-street access, 07/2023 © J. Mandl

Abroad, industrial estates with railway sidings and truck roads are accessible in part to the public. Whether it is to pass through them, to access a polyfunctional sites or to water bodies. Examples include Linz in Austria, Antwerp in Belgium or even the Romanian seaside town of Constanta. In the Austrian and Romanian cities, museums are located directly in the industrial area of the port.

Every year, a tour of the Tugboat ŠTUREC is held as a museum exhibit. On the first Saturday in June, the possibility of an organised entry to the port area is tested. Visitors, as an organized group, have the opportunity to tour the ship. As the Tugboat ŠTUREC is located on the platform of the Ship Lift, it is possible to see within the harbour to the southern pool area of the Winter Harbour, Danube embankment. Visitors also have the opportunity to see the former functionalist Boatmen's House and the aforementioned Shipping Hall up close.

Conclusion

The protection and restoration of the Shipping Hall is dependent on communication between the various institutions of the Slovak Republic, as well as the private sector. The main objective of the public and private sector should be to create a central space presenting the history of water transport and shipbuilding in Slovakia as a whole. For example, in the area of the former Shipping Hall located in the oldest preserved part of the Bratislava Harbour – Winter Harbour. The area built on the Danube River at the turn of the 20th century and the buildings dating back to the first half of the 20th century create the potential for the creation of an exceptional in situ Museum of Water Transport. This initiative is supported by the city, the municipality of Ružinov and, finally, the Bratislava Administrative Region. The European Network of River Museums ENoRM, of which the STM-Transport Museum in Bratislava is a member, also joins in the support.

For the past 10 years, and especially at present, work has been underway to prepare a comprehensive conversion of the building. Furthermore, the management of the use of the building should be developed during the preparatory work for the reconstruction of the building. The architectural study will frame the final layout and operational relationships of the building and the surrounding area. The building use plan will reflect the investor's requirements for the use of the building, taking into account possible future changes, in this case mainly in the wider surroundings. In the sinusoids, there are discussions at government level about strategic economies such as ports. In the longer term, there is talk of building a port downstream along the Danube. In this case, this would contribute to the reurbanisation of the former port area for new urban districts, similar to what we know from other European or world capitals. A water transport museum situated in the Shipping Hall in close contact with other historical buildings with the status of national cultural monuments would contribute to the diversification of the urban area in a similar way as the already restored buildings Pradiareň or Jurkovičová tepláreň contribute to it.

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BATTLE OF THE DANUBE RIVER

THE ROYAL AIR FORCE AIRCRAFT AGAINST RIVER TANKERS AND RIVER SHIPPING AND MINING OF THE RIVER (APRIL-AUGUST 1944)

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Abstract

At the beginning of April 1944, the Royal Air Force started to mine the Danube River to reduce river shipping, especially oil and oil products transport from Romanian Oil Fields. The Royal Air Force conducted such missions during nights. Germany and Allies had no efficient river and air forces to defend. Losses of vessels became enormous. Germany, Romania and Hungary tried to improve and increase river forces but it was not enough. They used not only river minesweepers but also special minesweeping aircraft to clean the river.

The mining of the river surely restricted shipping. It is clear from the report of Slovakian Dunajplavba River Shipping Company. Monthly on average, 110 thousand tons of oil were shipped from Giurgiu Port in Romania until April 1944. It was decreased to 35 thousand tons in May 1944, to 33,6 thousand tons in June 1944, increased to 59,5 thousand tons in July 1944 and once again decreased to 35 thousand tons in August 1944. Because of the war and political situation, shipping of oil from Romania on the Danube River was stopped at the end of August 1944.

Keywords: World War II, minesweepers, river shipping, Danube, Royal Air Force

German Army, Navy and Air Force faced at the beginning of April 1944 the problem how to retreat from Crimea Peninsula. Nearly 84 thousand people were embarked only between 1 April and 30 April 1944 in Sevastopol port. 5813 wounded German soldiers, 2038 wounded Romanian soldiers, 18 308 German soldiers, 26 212 Romanian soldiers, 727 Slovakian soldiers and 8067 auxiliary volunteers, 14 969 civilian volunteers and members of voluntary auxiliary forces, 4368 prisoners of war and 2974 Civilians were among them. All in all, more than 4 thousand tonnes of goods, ammunition, weapons and other materials was shipped off Sevastopol. On the other hand, only 1222 German soldiers, nearly 2350 tonnes of fuel, 87 tonnes of Field Post, 151 guns and nearly 7700 tonnes of ammunition and other materials were shipped in.[1] In Romanian Constanza

[1] The National Archives Kew (hereinafter TNA), DEFE3/703, ZIP/ZTPGR/12262.

port all in all 79 969 people and 2453 tonnes of different materials were disembark between 18 and 30 April 1944. 406 people were missing after Romanian Alba Iulia Passenger ship and Leo Cargo ship were attacked.[2] For the evacuation of people and goods the Danube River was particularly used as well. All of the army branches were engaged in this operation. German Supreme Command was surprised and totally unprepared for Royal Air Force offensive against the Danube River. British airmen started to mine Danube at the beginning of April 1944 during night missions.

Royal Air Force´s No. 205 Group based in the Italy started to conduct these operations on the night 8 to 9 April 1944. The first phase of this battle ended on Night 14 to 15 April 1944. Royal Air Force activity was very well described by several authors. I will try to describe in the following lines what such mining caused in the first two months of offensive. More light to these operations was shed by deciphered German messages which clear what the measures to clean the Danube the German Command took.

It was not so easy to prepare such extraordinary missions, because there were no airmen who had an experience as is written in the Operations Record Book of No. 205 Group: *„´Gardening´ operations commenced in April 1944 and the River Danube was mined with approximately 200 mines, Mark IV and Mark V. Difficulty was experienced in obtaining necessary slings, suspension bands, and bomb beams; and the necessary experienced personnel specialised in the preparation of the mines. The electrical personnel were eventually flown from the Middle East the day prior to the operation.“* ´Gardening´ was cover name for mining operation and mines were usually called ´cucumbers´ as garden plants them.[3]

Senior Naval Officer of the German Naval Iron Gate Group (Eisernes Tor Gruppe) reported that Danube was overflown at 11.37 p. m. on 8 April 1945 by eight enemy planes in pretty low altitude. It was expected that mines were dropped in the Danube around Romanian town Baziaş.[4] This speculation was confirmed in the morning. Drifting mines were reported near river kilometres (abbreviation rkm and/or rkms) 1131 and 1150. [5]

German Command was not so wrong concerning British bombers which carried out this mission. No. 37 Squadron deployed ten Wellington Mk. X bombers of which five dropped mines 3 miles East of Belgrade as ordered and one 6 miles west of Belgrade. Rest did not fulfil mission and brought mines back to the base. Crew dropped mines from altitude between 400 to 500 feet.[6]

Of ten Wellington bomber of No. 70 Squadron deployed one failed to return and other overshot the target and mines were not dropped into the river but to the neighbouring

[2] TNA, DEFE3/703, ZIP/ZTPGR/12267.
[3] TNA, AIR49/95, No 205 Group — Central Mediterranean Forces: reports, June 1941 - Dec. 1946.
[4] TNA, DEFE3/701, ZIP/ZTPGR/10459.
[5] TNA, DEFE3/701, ZIP/ZTPGR/10409 and ZIP/ZTPGR/10408.
[6] TNA, AIR27/392/8, Operations Record Book No. 37 Squadron, April 1944.

garden. Rear gunners of the bombers attack the river shipping by machine gun fire by Omoljica, Starčevo and Ritopek. All in all, they dropped sixteen 1600 lb. mines Mark III and IV from a height of 250 to 500 feet.[7] All three Liberator bombers of No. 178 Squadron fulfilled task as ordered. They were loaded only with four mines each.[8]

When mining the river between Belgrade and Bazias, the starboard engine of Vickers Wellington B. Mk. X LP139, DU-B was set on fire by enemy light Anti-Aircraft-Artillery (AAA) and crash landed. Three men were killed and pilot P/O J. A. Gibson and air bomber F/O W. R. Elvin evaded capture with the help of Serbian partisans and later escaped to Italy.[9] As stated later, the Danube Flotilla was credited with shooting down this bomber. Most probably by AAA from some ship.[10]

The first victim of mining offensive became Tulln passenger steamer which struck a mine nearby rkm 1131 in the morning on 9 April 1944 and sank causing 6 dead. The ship was owned by Donaudampfschifffahrt Gesselschaft (acronym D.D.S.G). She was wrecked nearby Panchevo (Serbian Pančevo). Another boat from convoy tug sank nearby rkm 1131 by Gročka.[11] Command started to be afraid that it could be beginning of great scale operation to hinder traffic on the Danube. Staff of the Danube Flotilla (Donauflotille) proposed on 9 April 1944 that should be necessary to create new commanding post for coordination of minesweeping and suggested that Lieutenant Commander (Korvetenkapitän) Eduard Helleparth von Hellnek should be appointed.[12]

Similar pieces of information could be read in the War Diary of Commander of Iron Gate (Kampfkommandant Eisernes Tor). Enemy planes flew over Moldova Vecche and Bazias at 11.37 p. m. on 8 April 1944. It was surmised they dropped mines in to the Danube River. Nearby Panchevo was sunk by mine hospital ship Tulln sailing upstream at 7.45 a. m. on 9 April 1944. Six men were left missing; the rest was saved. Most probably mines were as well dropped nearby river port Bazias. Nearby Gročka was sunk by mines lighter DDSG6514 and Slovak River Tanker T-X was heavily damaged by striking a mine in the same place. One sailor was killed.[13] Report of Slovak Dunajplavba River Shipping Company clears that T-X river tanker was badly damaged and two sailors were wounded. Except for these, mines damaged as well T-I river tanker of this company on unknown date in April 1944.[14]

Because of the mining, C. O. of Danube Flotilla ordered the Danube to be closed for traffic between Semlin (part of Beograd) and Moldova Veche in the evening of 9 April 1944. Command had a lack of sufficient river minesweepers and decided that special mine-sweeping aircraft should be deployed. It was estimated that magnetic mines

[7] TNA, AIR27/617/8, Operations Record Book No. 70 Squadron, April 1944.
[8] TNA, AIR27/1120/8, Operations Record Book No. 178 Squadron, April 1944.
[9] See GUNBY, David, KAŠŠÁK, Peter, Gardening by Moonlight. 205 Group RAF mining operations over the River Danube in 1944. Bratislava : Degart 2017, pp. 28-29.
[10] TNA, DEFE3/701, ZIP/ZTPGR/10840.
[11] TNA, DEFE3/701, ZIP/ZTPGR/10446 and ZIP/ZTPGR/10684.
[12] TNA, DEFE3/701, ZIP/ZTPGR/10701.
[13] Bundesarchiv/Militärarchiv Freiburg im Breisgau (hereinafter BA/MA), RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[14] Štátny archív Bratislava (hereinafter ŠAB), f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o XIX. zasadnutí SLOVENSKEJ DUNAJ PLAVBY, ÚČ. SPOL, ktorá sa konala v pondělok 8. mája 1944 o 17.40 hod. v spoločenskej miestnosti hotelu na Železnej Stúdničke v Bratislave and Zápisnica o XX. zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL, ktorá sa konala v útorok dňa 6. júna 1944 o 17.20 hod. v zasedacej miestnosti spoločnosti v Bratislave.

were dropped. Flotilla started to clean the river from rkm 1151. It was suggested in the report sent on 9 April 1944 that *„further mine-laying must be reckoned with"*. [15]

Senior Officer of Danube Flotilla expressed feelings of Staff Officers in a message to Naval Liaison Staff in Bucharest which was sent in the night of 9 April 1944: *„The systematic disturbance of Danube supply traffic apparently intended by the enemy is definitively of war importance. A rapid decision by Gruppe Süd is therefore requested."* [16]

Admiral of the Black Sea urgently needed to be deployed mine-sweeping aircraft to clear the Danube River. He asked at least for two such planes. The message was addressed to the Staff of Luftflotte 4 and 1st Air Corps (I. Fliegerkorps). He suggested to operate from Semlin A/F near Belgrade. He claimed short before the midnight on 11 April 1944: *„Danube closed between Pancevo and Moldova owing to mine-dropping. An important transport route has thus been paralysed for days."* [17]

German 1st Air Corps (I. Fliegerkorps) informed on 12 April 1944 that two minesweeping aircraft of the 3rd Squadron of Mine Seeking Group 1 (3./Minensuchgruppe 1) were deployed immediately to Belgrade/Semlin A/F. They were ordered to sweep the Danube River between Pančevo and Moldova. This was special version of Junkers Ju 52 aircraft, named Junkers Ju 52 MS. MS meant die Magnetspulle [18]

During the war, the Ju 52/3m was used by the minesweeping squadrons of the Luftwaffe. The company MNH (Maschinenfabrik Niedersachsen Hannover) converted a total of 151 aircraft to mine-sweeping service accordingly by October 1944. The machines were designated Ju 52/3m MS (MS = die Magnetspule) and were equipped with a 15 m diameter solenoid installed under the fuselage. Due to the magnetic field, magneto ground mines could be detonated during the overflight at 120 km/h at an altitude of about 30 meters above the sea and/or the river and the river estuary. The power supply of the 35-centimetre wide and 10 cm high coil with 44 turns of aluminium wire, through which a current of 300 amperes flowed, was provided by a generator of 15 kW power installed in the fuselage, which was driven by a car engine. The flight altitude of typically 30, at least 10 m was controlled by a towed, weight-loaded cable, which gave an electrical signal by hitting the water surface. On September 15, 1940, the first crew were briefed for such a mission. The first mission took place from Gilze-Rijen airfield in the Netherlands at the mouth of the Westerschelde in Vlissingen.

German aerial minesweeping tactics differed slightly from Royal Air Force practice. Flight speed was almost identical at 125-135 mph but altitude was determined by water depth. The German magnetic sweep aircraft flew 40 meters (130 feet) above the seabed and/or riverbed, requiring an altitude of 10-20 meters for most flights. Also, the Germans employed two magnetic-coil equipped MS aircraft in line abreast with 30- to 40-meter separation, followed by a single KK-Gerät (KKG, das Knallkörpergerät)

[15] TNA, DEFE3/701, ZIP/ZTPGR/10684.
[16] TNA, DEFE3/701, ZIP/ZTPGR/10587.
[17] TNA, DEFE3/701, ZIP/ZTPGR/10742.
[18] TNA, DEFE3/702, ZIP/ZTPGR/11272.

aircraft trailing about 40 meters behind them. Typically, the mines detonated about 5-10 meters behind the magnetic sweeps, making for some exciting moments for the KK-Gerät pilots. Additionally, Germany's aerial minesweepers faced opposition in most of their operating areas and the Luftwaffe did not provide fighter escorts. As losses mounted, defensive armament was increased. By October 1943, the MS aircraft were toting a 20mm cannon in the dorsal position and 13mm machine guns in the beam positions, but losses continued. German Air Force operated mostly over the Danube River with sole plane of this type.

Other problem was how to employ against mining any night fighters. Commander of Fighter units in Romania (Jagdfliegerführer Rumänien) Lieutenant-Colonel Eduard „Edu" Neumann had only two Squadrons of Night Fighter for disposal: I. Gruppe Nachtjagdgeschwader 6 (I./NJG 6) with Junkers Ju 88 Night Fighters and 6./NJG 101 with Dornier Do 217 Night Fighters. As Neumann himself quoted, Anti-Aircraft-Artillery (AAA) units were most efficient against the Allied Bombers during the nights.[19] In fact, 6./NJG 101 was subordinated from end of December 1943 to Jagdfliegerführer Ostmark (Commander of Fighter Units in Ostmark (Austria)).

Operation of I./NJG 6 over the Danube River became timely hindered. Only 8 Messerschmitt Bf 110 Night Fighters were deployed on 3 May 1944 to Wiener Neustadt A/F. They were most probably of 3. Staffel Nachtjagdgeschwader 6 (3./NJG 6). First operation was flown during Night 4 to 5 May 1944 by 7 Messerschmitt Bf 110 Night Fighters against Allied bombers operating around Budapest. One Wellington bomber was shot down by Uffz. Nahlik of I./NJG 6 west of Budapest. Supposedly own Anti-Aircraft-Artillery shot down plane of Lt. Günther Lomberg of 3./NJG 6. Crew remained unhurt and aircraft was damaged with 15%.

The Allies were bombing Wiener Neustadt on 10 May 1944. All of the operational aircraft of I./NJG 6 were in time transferred from Wiener Neustadt to Prostějov (Prossnitz) A/F in Moravia. During the night of 10 to 11 May 1944 one Messerschmitt Bf 110 of 3./NJG 6 was shot down over Budapest, most probably by own AAA. Uffz. Nahlik, victor of Night 4 to 5 May 1944, was killed, Gefr. Wendt was lightly wounded and Gefr. Lürsdorf unhurt.

It was planned to transfer the rest of I./NJG 6 to Wiener Neustadt but during the inspection Hptm. Heinz-Martin Hadeball, Commanding Officer of 3./NJG 6, stated that Wiener Neustadt A/F and even Steinamanger (Szombathely) A/F were not suitable for Night Fighters because of radar and navigational equipment. During 14 May 1944 all of the Night Fighters of I./NJG 6 from Wiener Neustadt were transfered to Echterdingen A/F. So, except for 6./NJG 101 in Parndorf there were no Night Fighters to operate against mining of the Danube river by enemy planes during nights.[20]

Second mission was flown by RAF on the night of 12 to 13 April 1944. The three squadrons which had already fulfilled the first mine dropping mission, were involved.

[19]BA/MA, RL8/210, NEUMANN, Eduard, Es geht um Öl! Bericht des Jagdfliegerführers Rumänien Oberst Neumann über seine Tätigkeit u. Räumung Rumäniens.
[20]BA/MA, RL10/542.

This mission was planned to be earlier but bad weather caused that such mission could not be conducted. There was no extraordinary event. All of the bombers successfully returned. South African No. 37 Squadron, equipped by Wellington bombers, dropped seven mines between Gardinovci, near Novi Sad, and Surnik and four between Bazias and Belgrade. Ten Wellingtons of No. 70 Squadron were ordered to drop mines between Palanka and Stari Futag, west of Novi Sad. It was fulfilled successfully, only one aircraft due to technical malfunction dropped mines east of Belgrade. No. 178 Squadron sent twelve planes of which only one did not fulfil the task. Liberator Mk. VI, s/n EV939, was unable to locate place to drop and jettisoned bombs over Adriatic. Others dropped mines between Bačka Palanka and Furtog as ordered. [21] During this night Rumanians reported that three mines were dropped nearby Belobreșca approximately at 2 a. m.[22]

Germany reported that mines were dropped in the Danube Estuary on the night of 13 to 14 April 1944. One mine was swept, six fell ashore. [23] Senior Officer of Iron Gate Group announced that three objects of approximately 50 x 30 centimetres were dropped in the Danube River between Veliko Gradište in Serbia and Belobreșca in Romania at 2.40 a.m. on 13 April 1944. [24]

Vice admiral Helmuth Brinkmann asked Major General Karl-Heinrich Schulz, Chieff of Staff of Luftflotte 4, for help shortly after new dropping of mines was reported. Message was intercepted by the British on 13 April 1944 at 01.25 a.m. Brinkmann in four points described the situation on the Danube: *„1) Danube again mined between Sulina and Braila. 1 mine swept on 12/4. Mining of Danube Estuary is at present particularly incisive in effect as important tonnage for Crimea evacuation is held up. 2) Mines dropped on the Danube between km 402 and 415 and km 475 and 485. Romanian operation division thereby held up passage to Galatz. 3) Danube continues to be closed between Pancevo and Moldova, ... 4) There are at present only 4 serviceable minesweeping aircraft in Admiral Black Sea´s Area. The operation of further machines for tasks at present of decisive importance. To the war is urgently necessary. Again request they provided with all speed.“* [25]

German Command was not sure what the mines were for. Senior Officer of Iron Gate Group (Eisernes Tor Gruppe) reported around noon 14 April 1944 that *„drift mine fired on by Flak at 1205 near Moldova. Not detonated. Increased vigilance“*. [26] Couple minutes afterwards, Flug-Überwachungsboot 2 (Arcraft reporting Boat No. 2) sent message in which was stated: *„Two mines, not yet exploded on land at mile 16. Romanian Gendarmerie requests that a mine disposal party be provided.“*[27] Two days later, Chief Quartermaster of German naval Group South (Gruppe Süd) announced that *„owing to the fouling of the Danube with enemy non-contact mines i tis extremely urgent*

[21] GUNBY, David, KAŠŠÁK, Peter, Gardening by Moonlight. 205 Group RAF mining operations over the River Danube in 1944. Bratislava : Degart 2017, pp. 30-33.
[22] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[23] TNA, DEFE3/701, ZIP/ZTPGR/10902.
[24] TNA, DEFE3/701, ZIP/ZTPGR/10890.
[25] TNA, DEFE3/701, ZIP/ZTPGR/10808.
[26] TNA, DEFE3/702, ZIP/ZTPGR/11053.
[27] TNA, DEFE3/702, ZIP/ZTPGR/11048.

to set up degaussing installations at Brăila and Belgrade and get them to operation. Press forward with construction work with all means and report when installations is ready to operate". [28]

In the situation report dated 14 April 1944 it is written that all in all six parachute mines were found ashore. Two minesweeping aircraft conducted seven, respectively six sorties (covering flight) over the Danube River between mile 10 and miles 22 and mile 22 and mile 34 without results. It was probably the first time when they operated. [29]

Third operated RAF aircraft flew over the Danube River on the night of 14 to 15 April 1944. Because of other bombing missions, No. 205 Group could only deploy Liberator bombers of No. 178 Squadron. Operation was not so successful as was estimated. Of eleven bombers two crashed shortly after take-off (Liberator B.Mk. VI EV825, D and Liberator B.Mk. VI EV820, R). Two aircraft dropped mines in the Danube River but crew were not certain in which places and one Liberator dropped mines in the river Jiu by Jiul some 15 miles south of Craiova. Other crews were not able to locate the Danube River because of haze and a waning moon low in the sky. All in all, only thirty mines Mark 5A were dropped. [30]

Naval Liaison Staff Romania reported that it was estimated that the Danube River was mined from Lom to Moldova by 25 to 30 bombers from 10.30 p.m. to 11. 59 p.m. Some mines detonated ashore. It was confirmed by German aircraft and Romanian Sentry. [31]

Next day Hungarian Radio Broadcast reported that the Danube River was mined between Dunavecse and Mohács on the Hungarian territory. As reported on 16 April 1944 evening the minesweeping was not successful. Daily Summary for this day stated that *„type of mines dropped has not yet been recognised"*. Two minesweeping planes were deployed between Semlin and Moldova with no results. It was as well reported that German Air Force Supreme Command decided to transfer one minesweeping aircraft from Saloniki to Pančevo.[32] It was as well reported that Lom, Kalafat, Turnu Severin and to within 100 km east of Belgrade was mined on 16 April 1944 and the shipping was prohibited on the Danube River in these areas. [33]

The situation for the shipping on the Danube River got worse and worse. C. O. of German Naval Group South wrote: *„In view of the extremely menacing enemy parachute mine offensive on the Danube, the Naval Liaison Officer with Army (H) Group ´F´ captain von Both is entrusted as representative of Gruppe Süd with the unified control of operations of all minesweeping facilities of the Navy, Army and German Air Force minesweeping aircraft with immediate effect, pending the arrival of the Inspector of the rivers already appointed by Naval War Staff. All German and Allied Offices with minesweeping facilities at their disposal and also Operations Headquarters of the German or Allied parachute mine observer service are requested as from now to address*

[28] TNA, DEFE3/702, ZIP/ZTPGR/11033.
[29] Ibidem.
[30] GUNBY, David, KAŠŠÁK, Peter, Gardening by Moonlight. 205 Group RAF mining operations over the River Danube in 1944. Bratislava : Degart 2017, pp. 34-37.
[31] TNA, DEFE3/702, ZIP/ZTPGR/11079.
[32] TNA, DEFE3/702, ZIP/ZTPGR/11119.
[33] TNA, DEFE3/702, ZIP/ZTPGR/11204.

all communications regarding the dropping of enemy mines and measures already taken direct to Naval Liaison Officer (H) Group ´F´ and to meet the requirements of the Naval Liaison Officer in regard to operations.“[34]

The other question was how degaussing ships were selected for minesweeping duties. Turnu Severin Dockyard was ready on 16 April 1944 to fit such installation on the guard ship Gunther.[35] The current state of minesweeping aircraft to clear the Danube River was on 16 April 1944 as following: two planes in Bucharest, three planes in Belgrade which originated from German Air Force Command Southeast (Luftwaffenkommando Südost) and one plane in Belgrade and four deployed up the river from Galați which earlier belonged to Luftflotte 4.[36]

Commander of Iron Gate reported on 17 April 1944 that one mine exploded in the water nearby eastern tip of Ostrovo River Island west of Veliko Gradište.[37]

Inspector for minesweeping on the Danube and tributaries asked on 17 April 1944 the Navy and Army Officers in Hungary, Romania and Bulgaria which vessels they can deploy for minesweeping and where they were currently located. He was especially curious about how ships were equipped for the removal of moored and non-contact mines.[38]

Romanian Authorities reported that three mines were dropped between rkms 235 and 288 and Bulgarian Offices reported mine droppings between rkms 561 to 577 on 18 April 1944. Actually, no mine dropping operation was conducted by Royal Air Force during night of 17 to 18 April 1944. Three minesweeping aircraft were deployed on the Roșiorii de Vede Airfield to clean Upper Danube between rkms 740 and 812 and two minesweeping planes were ordered in collaboration with Romanian R-boat to check area between rkms 235 to 288.[39]

Naval Liaison Officer by Army (H) Group ´F´ von Both suggested on 18 April 1944 that *„there is an impression, which it has so far been impossible to investigate, that the failure of Mausi aircraft to sweep mine is due to excessive altitude. Is being examined“*.[40] Allied bombing also disrupted Belgrade and facilities in this town including the Danube Dockyard Semlin. In this dockyard *„are no longer any possibilities of repair at Belgrade or they are extremely limited“*. It put a brake on the refitting of the vessels for minesweeping duties. As it was written: *„Installation of degaussing and measuring on Alberich will be completed on 19/4. Degaussing installation has arrived Belgrade. Senior Constructor Brammer has taken over work. So far disturbed by air attacks. According to present considerations. A further degaussing installation is necessary at Linz and Budapest. Established by rough estimate with the responsible water service offices that in the strained traffic situation there is an average of 40 vessels daily in both directions.“*[41]

[34] TNA, DEFE3/702, ZIP/ZTPGR/11071.
[35] TNA, DEFE3/702, ZIP/ZTPGR/11214.
[36] TNA, DEFE3/702, ZIP/ZTPGR/11498 and DEFE3/702, ZIP/ZTPGR/11463.
[37] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[38] TNA, DEFE3/702, ZIP/ZTPGR/11258.
[39] TNA, DEFE3/702, ZIP/ZTPGR/11329.
[40] TNA, DEFE3/702, ZIP/ZTPGR/11326
[41] Ibidem.

Minesweeping aircraft were not successful on 18 and 19 April 1944 as no mine was swept. Belgrade – Pančevo stretch was opened for traffic on 19 April 1944. Only following ships were at war-readiness for minesweeping on the Danube on this date: Trixi and Widder.[42] Delphin, Oder, Weichsel, Descartes and Lavoisier were not at war readiness. Zemun and Traisen were at limited war readiness as they were without a degaussing power unit.[43] Command wanted to deploy on the Danube River warship Sperrbrecher 193 which operated at the sea nearby the Danube Estuary. But it was reported on 20 April 1944 that she was not available because she was hit by aircraft bomb and lost.[44]

The Danube River was opened for shipping between rkms 235 and 288 on 20 April 1944. It was as well reported that *„mining from km 740 to 812 only suspected because on the night of 15-16/4 enemy A/C probably assembled there to attack Turnu-Severin"*. Belgrade – Iloc stretch (rkms 1170 to 1301) was provisionally opened for shipping from noon on 20 April 1944 and it was expected that Belgrade – Moldova stretch (rkms 1170 to 1049) would be opened from noon 21 April 1944.[45]

Current state of minesweeping aircraft was reported on 20 April 1944. There were eight planes ready to operate, one unserviceable. Three of them being at Galați, there of them at Belgrade and three of them at Rosiorii-de-Vede.[46]

The Danube Flotilla at Linz prepared other ships to be deployed for minesweeping duties. Former Czechoslovak Danube monitor President Masaryk, named Bechelaren in German Navy was after repair ready to proceed from Linz to Vienna harbour Albern for degaussing on 22 April 1944. Other vessels at Linz, Köln and Alexandra, were nearly to be finished and put at war readiness.[47] Tragical event occurred on 20 April 1944. When one mine had been salvaged near rkm 780 on the Bulgarian territory, 14 persons were killed or injured by an explosion. [48]

It was reported on 21 April 1944 that *„activity of Mausi* [minesweeping planes] *restricted to the early hours and evening hours owing to English fighters from 0900-1600. Own fighter protection by O. C. Balkan fighters impossible owing to lack of aircraft"*. As in the previous days no mine was swept, nor by aircraft and vessels.[49] On the morning of the same day, Naval Liaison Officer by Army (H) Group ´F´ sent one message to several authorities. It clearly stated how enormous was the German attempt to salvage and investigate British mines. He wrote: *„It is possible to salvage the drift mines sighted with 2 pinnaces. Tow a line about 200 metres long between the 2 boats. Endeavour to tow mines ashore. Let them lie and report* [...] *Take care to avoid touching the small rod on the cover."*[50]

[42] TNA, DEFE3/702, ZIP/ZTPGR/11502 and ZIP/ZTPGR/11318.
[43] TNA, DEFE3/702, ZIP/ZTPGR/11567 and ZIP/ZTPGR/11651.
[44] TNA, DEFE3/702, ZIP/ZTPGR/11470.
[45] TNA, DEFE3/702, ZIP/ZTPGR/11616 and ZIP/ZTPGR/11607.
[46] TNA, DEFE3/702, ZIP/ZTPGR/11613.
[47] TNA, DEFE3/702, ZIP/ZTPGR/11610.
[48] TNA, DEFE3/702, ZIP/ZTPGR/11601.
[49] TNA, DEFE3/702, ZIP/ZTPGR/11554.
[50] TNA, DEFE3/702, ZIP/ZTPGR/11635.

On the 21 April 1944 one minesweeping aircraft was deployed between rkms 812 and 833 and three Mausis between Lom and Turnu Severin. It was successful day for flyers because three mines were swept at rkm 832. But on the other hand, some ships were lost to mines. *„Operations with acoustic gear km 1170 – 1049 without success, 3 tug convoys carrying out trial passage behind. The 3rd Tug convoy struck a mine. Investigation is proceeding. 1 vessel sank over the stern and 2 others were beached at km 1124,"* was reported. The Serbian area was closed for shipping. The Estuary to Moldova was opened. On the territory of Hungary several stretches (rkms 1301 to 1336, rkms 1425 to 1416 and rkms 1532 to 1647) were closed through the lack of sweeping-gear. The degaussing of Hungarian river forces was planned at Vienna harbour Albern as soon as possible.[51]

Slovak Dunajplavba River Shipping Company reported that DP7210 barge was damaged by a mine nearby Smederevo and helmsman was heavily wounded and the crew lost all of their private property. The barge was loaded with 400 tons of coal. D.D.S.G. 67240 barge was damaged by striking mine during the same occasion. This barge was used by Slovak Dunajplavba River Shipping Company.[52]

To plan the minesweeping operations better, the Danube River was divided into several operational areas. Banat Group would operate in the area Theiss Estaury including Save from the Drina Estuary as far as Bazias – Ram and Iron Gate Group in the area Bazias – Ram as far as Turnu Severin in the Serbia and Rumanbia.[53]

Minesweeping aircraft did not conduct any mission on 22 April 1944 due to the lack of fuel. Only at the evening one plane took off. No mine was swept by planes and/or ships. It was reported that „*one ship with sweeping gear was used without result between km 610 and 553. Then gear broke down* ".[54]

Croatian Navy reported that they put the strength of the Save River Flotilla (2 river gunboat, 1 tug, 3 motor-boats, Berths in Semlin and Brod) a tour disposal for minesweeping. It was written that Croatian Navy announced that there were 29 small tugs belonging to private firms registered: Semlin 11, Save 8, Peter Vardein 4, Vukovar 3, Esseg 3 and 950 boats in the Save Area, 403 of them belonging to Vukovar, 234 to Peter Vardein, 180 to Esseg and 130 to Save. All of them were available for transport duties on the Danube River.[55]

Another successful day for minesweeping crafts happened on 23 April 1944. Two mines were swept by ships with remote clearance gear, one nearby rkm 1122 (Udovice) and the second by rkm 1126 (Brestovik) in the Serbian Area. Minesweeping aircraft were successful in the Danube Estuary and all in all swept four mines.[56] At the same

[51] TNA, DEFE3/702, ZIP/ZTPGR/11604 and ZIP/ZTPGR/11597
[52] ŠAB, f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o XIX. zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL, ktorá sa konala v pondělok 8. mája 1944 o 17.40 hod. v spoločenskej miestnosti hotelu na Železnej Stúdničke v Bratislave.
[53] TNA, DEFE3/702, ZIP/ZTPGR/11598.
[54] TNA, DEFE3/702, ZIP/ZTPGR/11566 and ZIP/ZTPGR/11556.
[55] TNA, DEFE3/702, ZIP/ZTPGR/11492.
[56] TNA, DEFE3/702, ZIP/ZTPGR/11687 and ZIP/ZTPGR/11653.

time, it was reported that „new dropping“ occurred at rkm 1869 in the Area of Austrian town Hainburg and Slovak capital Bratislava. Details were lacking which is understandable because no mining operation was flown during the night of 22 to 23 April 1944.[57] In fact it caused difficulties because based on this information the Danube river was closed for traffic from Hainburg downstream on 24 April 1944. The Bechelaren warship which should proceed to the Lower Danube was able to return to Linz.[58]

On 23 April 1944 the Germans reported that *„agreement reached with the Royal Hungarian War Ministry (Lt. Gen. Trunkwalter) on 20/4 regarding operation of Hungarian minesweeping formations and their equipment. The Hungarians have made available various vessels for Sperrbrecher etc. Their suitability requires examination“*. One mine dropped on land near Vidin on unknown date was rendered safe by the Bulgarian Navy. An examination by German special detachment showed them to be British parachute mines with induction firing.[59]

The Command of German Naval Group South (Gruppe Süd) was sure on 24 April 1944 that *„appointment of a mining and barrage Offgicer experienced in mine-sweeping service is urgently requested for Danube Flotilla. Naval Liason Staff Rumania is putting forward application for increase in war emergency complement through service channels.“*[60]

The Danube vessels were successful in minesweeping on 24 April 1944. It was reported that two mines were swept at 1 p.m. nearby rkm 1122 [61] and one at 4.15 p.m. near rkm 1126.[62] Another mine was successfully swept by auxiliary minesweeper Alberich around noon on 25 April 1944 near rkm 1147,5.[63] One minesweeping aircraft flown on a mission over Pančevo (rkm 1154) to Novi Sad (rkm 1257) in the Serbian territory ten times with no result. The Danube stretch Kovin – Smederevo was opened for traffic as a result of the minesweeping.[64] Naval Liaison Staff Romania reported in the afternoon of 25 April 1944 that three minesweeping aircraft were ready to operate from Rosiorii-de-Vede Airfield. [65]

Another two mines were swept on 26 April 1944 near Kovin (rkm 1110) and one near Dubravica (rkm 1102), on the stretch which was opened day before.[66] The first two were swept at 5.50 a.m. and the third one at 6.15 a.m. by auxiliary minesweeper Alberich as it was reported by Commander of the ship.[67] One boat of the remote clearance group became lost near km 1110 as the result of a mine explosion.[68] However, no minesweeping operation was done on Hungarian part of the Danube River because *„gear has not yet arrived and Hungarian Danube clearance flotilla still in process of formation “*.[69]

[57] TNA, DEFE3/702, ZIP/ZTPGR/11770.
[58] TNA, DEFE3/702, ZIP/ZTPGR/11630.
[59] TNA, DEFE3/702, ZIP/ZTPGR/11770.
[60] TNA, DEFE3/704, ZIP/ZTPGR/13679.
[61] TNA, DEFE3/702, ZIP/ZTPGR/11619
[62] TNA, DEFE3/702, ZIP/ZTPGR/11621.
[63] TNA, DEFE3/702, ZIP/ZTPGR/11804 and ZIP/ZTPGR/11868.
[64] TNA, DEFE3/702, ZIP/ZTPGR/11868.
[65] TNA, DEFE3/702, ZIP/ZTPGR/11883.
[66] TNA, DEFE3/702, ZIP/ZTPGR/11861.
[67] TNA, DEFE3/702, ZIP/ZTPGR/11887 and ZIP/ZTPGR/11888
[68] TNA, DEFE3/702, ZIP/ZTPGR/11861 and 11902.
[69] TNA, DEFE3/702, ZIP/ZTPGR/11861.

The Danube stretch from Belgrade (rkm 1170) to Moldova (rkm 1049) and back was opened on 26 April 1944 for shipping. Although it was limited as follows: *„On opened stretches of the Danube tug convoys routed downstream may only proceed in the following formation: Coal and timber 3 tows, Grain 2 tows, Iron gear and ammunition 1 tow. Tug convoys routed upstream as previously. Towing lines not above 60 metres and not below 40 metres. Passenger ships are not permitted to proceed".*[70]

Auxiliary minesweeper Weichsel recovered *„a globular English petrol container of about 600 litres capacity"* near rkm 710 on the Bulgarian territory on 26 April 1944. The container was sent to Ruse to be investigated. No mines were swept by this particular ship.[71]

German Air Force Command South-east (Luftwaffenkommando Südost) reported that the Bulgarian Danube stretch Lom (rkm 744) – Nikopol (rkm 597) was mined by ten to twenty planes during the night of 25 to 26 April 1944. But no operation of Royal Air Force was conducted during previous night and/or current day.[72] Next day it was not confirmed by German Naval Liaison Staff Romania.[73]

On 27 April 1944 minesweeping aircraft were ordered to fly on a long-range mission. They should take off from Pančevo Airfield (rkm 1154) via Bucharest (rkm 1647) to Vienna (rkm 1929).[74] Most probably such mission would not be flown. Captain at sea (Kapitän zur See) Anselm Lautenschläger took over the duties of the Inspector of Danube Minesweeping Service (Inspekteur Minenräumdienst Donau, IMRD) with immediate effect on 27 April 1944. His headquarters were based at Belgrade.[75]

Alberich was once again successful in minesweeping. As reported by her Commanding Officer „*one mine cleared near mooring-pontoon Dubravica [rkm 1102] at 7 p. m. on 27 April 1944*."[76] The other casualty during minesweeping was reported little bit later by the same Commander at 7.25 p. m. on 27 April 1944. The ship had been attempting to salvage a FRG-boat.[77]

Five minesweeping aircraft were serviceable at Craiova Airfield on 28 April 1944. No mines were swept between rkms 812 and 839 on the Romanian territory. As it was written in the daily summary for 28 April 1944: *„Further operations depend on delivery of fuel. Tank wagons on the way from Ploiești since 16/4. Tank Wagons for land transport not available."*[78] Captain at sea Lautenschläger reported on the same day that no mine was swept either by vessels and/or planes. The Danube stretch Vienna (rkm 1929) to Brăila (rkm 171) was declared to be open for shipping. [79]

[70] TNA, DEFE3/702, ZIP/ZTPGR/11861.
[71] TNA, DEFE3/702, ZIP/ZTPGR/11878.
[72] TNA, DEFE3/702, ZIP/ZTPGR/11861 and ZIP/ZTPGR/11875.
[73] TNA, DEFE3/702, ZIP/ZTPGR/11951.
[74] TNA, DEFE3/702, ZIP/ZTPGR/11861.
[75] TNA, DEFE3/702, ZIP/ZTPGR/11952.
[76] TNA, DEFE3/703, ZIP/ZTPGR/12147.
[77] TNA, DEFE3/702, ZIP/ZTPGR/11961.
[78] TNA, DEFE3/702, ZIP/ZTPGR/11956.
[79] TNA, DEFE3/702, ZIP/ZTPGR/11956.

The creating of Hungarian river minesweeping flotilla was postponed so Captain at sea Lautenschläger sent message to Special Commander (Sonderführer) V. Gutenberg on 29 April 1944 to *„arrange for immediate passage upstream to Vienna of the tugs Maros, Zoltán, Banff-Utihany [?] and Komárom. Confiscated for minesweeping purposes by the Commander of the Royal Hungarian River Forces, so that degaussing may be put in hand forthwith. Do not wait for them to take the minesweeping gear at Ganz Danubius Dockyard Budapest with them"*.[80]

No mine was swept on 29 April 1944. There were all in all 5 minesweeping aircraft available, three of them at Craiova Airfield and two of them at Pančevo Airfield. As it was reported *„routine sweep from Vienna to Pančevo by minesweeping aircraft"*. The Danube stretch Regensburg – Brăila was declared to be open, although *„two dumb barges from tug convoy* [were] *damaged through detonation near Ritopek (km 1140)"* on 29 April 1944.[81] Slovak Dunajplavba River Shipping Company reported on 29 April 1944 that T-X river tankers were again damaged by striking a mine nearby Ivanovo.[82] The damaged barge standing in shallow waters was later robbed by Serbian guerrillas, inventory was loaded on a fishing-vessel and moved off. The crew was left naked and robbed of everything. The barge was loaded with crude. Later, the barge was remorked to Banat bank of the Danube River and unloaded.[83]

At the end of 29 April 1944, it was reported that *„clearance vessels at present available. In the Romanian area 4 tugs with towed coil gear and GBT, in the Serbian area 1 tug with remote clearance gear and GBT, in the Hungarian area none and in the German area none"*.[84] GBT means special device for minesweeping = die Geräuschboje Turbine.

It was necessary to raise the amount of minesweeping aircraft at the disposal of Inspector of Danube Minesweeping Service. German Air Force Command South-east (Luftwaffenkommando Südost) held five minesweeping planes at Galați Airfield, but they were there deployed to operate over the Danube Estaury and Black Sea. All of the planes of 3rd Squadron Minensuchgruppe 1 (3./MSGr. 1) were to be subordinated to Inspector of the Danube Minesweeping Service to sweep the entire Danube River. It was expected that further two or three aircraft would be disposed for these duties.[85]

Inspector of Danube Minesweeping Service reported that in the Serbian area nine tug convoys sailed, totalling 35 vessels. There was observed *„a mine detonation 350 metres ahead of tug proceeding downstream"* on 30 April 1944. One minesweeping aircraft carried out sortie from Pančevo to Budapest. There was one mine swept by this plane at rkm 1551. The mine detonated *„near five tug convoys proceeding*

[80] TNA, DEFE3/702, ZIP/ZTPGR/11974.
[81] TNA, DEFE3/702, ZIP/ZTPGR/11988.
[82] ŠAB, f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o XIX. zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL, ktorá sa konala v pondělok 8. mája 1944 o 17.40 hod. v spoločenskej miestnosti hotelu na Železnej Stúdničke v Bratislave.
[83] ŠAB, f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o XX. zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL, ktorá sa konala v útorok dňa 6. júna 1944 o 17.20 hod. v zasedacej miestnosti spoločnosti v Bratislave.
[84] TNA, DEFE3/702, ZIP/ZTPGR/11988.
[85] TNA, DEFE3/703, ZIP/ZTPGR/12028.

downstream".[86] The mine that exploded was reported also by the Commanding Officer of Iron Gate Group who wrote that a mine exploded nearby Kostolac, north of Pořarevac.[87]

Auxiliary minesweeper Alexandra was reported at war readiness on 27 April 1944 and she left Linz to operate.[88] The ship sailed to Budapest at 4.20 p.m. on 29 April 1944 and stood there anchored through the night. She was ordered to sail from Budapest at 5 a.m. on 30 April 1944.[89] Alexandra reported to Command at 11.51 a.m. on 30 April 1944: *„Continue passage in spite of mining. Slow speed at scene of mine."*[90]

Commander of the ship reported that she would begin onward passage at 3 p.m. Till this time she was anchored at rkm 1551 and conducted rescue action for ship Augsburg which sank immediately ahead of Alexandra. Commander as well mentioned that all in all five vessels were sank in this area during the whole day.[91]

Alexandra struck a mine again this day near rkm 1555 at 9 a.m. on 30 April 1944. That is why she was to be hold up at Dunaföldvár to be repaired for a short period. She was ordered to proceed back. She passed Vác (rkm 1779) at 3.10 p.m.[92]

Slovak Dunajplavba River Shipping Company reported that one mine sunk D.D.S.G. 65100 barge which was in tow of Ressel motor vessel nearby Budapest. Ressel continued in sailing to Galați Port.[93]

There was not only the threat of mines on the Danube River in Hungary. Senior Officer of German Naval Iron Gate Group reported that *„one mine detonated near km 1077 at 1350. Convoy undamaged"* on 30 April 1944.[94] The Commander of Alexandra reported in the evening of 1 May 1944: *„Convoy continue passage downstream at 1530/1/5. Am lying above mine position where 5 vessels have sunk."*[95] The situation was unchanged around 10 p.m. It was reported: *„Alexandra is lying above the mined area where 5 vessels sank and asks whether passage can nevertheless be continued. The sunken vessels were also said to have been degaussed."*[96] Alexandra finally reached Pančevo on 5 May 1944 and was ordered to continue passage to Orsova.[97]

The Germans in reaction to the Allies wanted to increase number of vessels suitable for minesweeping on the Danube River. German Naval Liaison Staff Romania reported on 30 April 1944: *„Triglav, Bopnar and Baclea goping through the degaussing loop in Belgrade. Then taking sweeping gear on board in Turnu Severin. Adrianopolis, Eugenia, Vuccino, Jean Milot and Pasteur are being brought to Ruschuk [Ruse]. From 2/5 a tug*

[86] TNA, DEFE3/703, ZIP/ZTPGR/12000.
[87] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[88] TNA, DEFE3/703, ZIP/ZTPGR/12024.
[89] TNA, DEFE3/703, ZIP/ZTPGR/12051.
[90] TNA, DEFE3/703, ZIP/ZTPGR/12021.
[91] TNA, DEFE3/703, ZIP/ZTPGR/12002.
[92] TNA, DEFE3/702, ZIP/ZTPGR/11995.
[93] ŠAB, f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o XX. zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL, ktorá sa konala v útorok dňa 6. júna 1944 o 17.20 hod. v zasedacej miestnosti spoločnosti v Bratislave.
[94] TNA, DEFE3/703, ZIP/ZTPGR/12004.
[95] TNA, DEFE3/703, ZIP/ZTPGR/12159.
[96] TNA, DEFE3/703, ZIP/ZTPGR/12318.
[97] TNA, DEFE3/703, ZIP/ZTPGR/12520.

will go through the degaussing loop every second day and necessary constructional alterations for each vessels, 5 days"[98] On the same day the Danube stretch Brăila – Turnu Severin was declared to be open.[99]

Auxiliary minesweeper Alberich continued in successful clearance of the Danube River on 1 May 1944. She was ordered to sweep the entire stretch of the Danube River from Theiss Estuary to Vukovar and back.[100] One mine was swept at rkm 1272,5 at 11.25 a.m.[101] The Commander of Alberich reported: *„Km 1272,5 at 0720. Tow 26548 from 3rd group of ships in tow of Banffy convoy struck a mine. The place had been covered by Alberich four times."*[102] It was reported at 5.25 p.m. on 1 May 1944: *„FR*-[boot] *1 and Alberich with 2 Sea Cows (Seekühe) sweeping place of mining again. FR*-[boot] *3 endeavouring to tow third Sea Cow to German Armed Forces Offic at Novi Sad. Repair unsuccessful as damage is too great."*[103] Later it was reported that Sea Cow was only slightly damaged and was being repaired.[104]

Other losses were reported on 1 May 1944. The following struck a mine and sank: Bulgarian passenger steamship Knjaz Simeon at rkm 683,5 and Romanian tug Cuzavoda [Crnavoda] at rkm 831. All in all, 9 towing vessels with a total of 46 vessels in tow were reported in the Serbian area. One mine was swept by ships at rkm 1172,5. The sample sweep by minesweeping aircraft from Pančevo to Budapest with main point at rkm 1550 was not carried out as ordered as the aircraft was withdrawn.[105] Tug Cusavoda [Crnavoda] of Donaudampfschifffahrtgesselschaft struck a mine near rkm 830 and sank at 2.15 p.m. on 2 May 1944.[106]

It was also planned that Bechelaren monitor (ex Czechoslovak river monitor President Masaryk) would leave Linz from Pančevo on 1 May 1944 at 7 a.m. which was really done.[107] She crossed the German/Hungarian border at 8 a.m. on 2 May 1944 at rkm 1861.[108] The movement of the ship was not so slow. This river monitor reportedly passed rkm 1806 at 10 a.m.[109] and Poske (rkm 1739) at 2 p.m. on 2 May 1944.[110] The ship passed Vác (rkm 1680) at 4. p.m.[111] So, in eight hours she sailed some 189 kilometres. Command was not sure if Bechelaren could sail further as reported in the message: *„Inquire of minesweeping Inspector whether a very valuable gunboat can pass through the Hungarian minefields without noise box."*[112] The ship was stopped until further orders in the early morning hours on 3 May 1944.[113] Commander of the ship was instructed in the morning hours of 3 May 1944 that *„no diesel oil to be*

[98] TNA, DEFE3/703, ZIP/ZTPGR/12034.
[99] TNA, DEFE3/703, ZIP/ZTPGR/12034.
[100] TNA, DEFE3/703, ZIP/ZTPGR/12140.
[101] TNA, DEFE3/703, ZIP/ZTPGR/12020.
[102] TNA, DEFE3/703, ZIP/ZTPGR/12136 and TNA, DEFE3/703, ZIP/ZTPGR/12334.
[103] TNA, DEFE3/703, ZIP/ZTPGR/12135.
[104] TNA, DEFE3/703, ZIP/ZTPGR/12257.
[105] TNA, DEFE3/703, ZIP/ZTPGR/12315.
[106] TNA, DEFE3/703, ZIP/ZTPGR/12231.
[107] TNA, DEFE3/703, ZIP/ZTPGR/12066 and ZIP/ZTPGR/12240.
[108] TNA, DEFE3/703, ZIP/ZTPGR/12459.
[109] TNA, DEFE3/703, ZIP/ZTPGR/12402.
[110] TNA, DEFE3/703, ZIP/ZTPGR/12235.
[111] TNA, DEFE3/703, ZIP/ZTPGR/12446.
[112] TNA, DEFE3/703, ZIP/ZTPGR/12248.
[113] TNA, DEFE3/703, ZIP/ZTPGR/12255.

had in the Budapest area. The nearest fuel station is Apatin. Bechelaren has anchored near km 1638 right bank."[114] In the morning at 7 a.m. the ship in reality returned from rkm 1630 to rkm 1641 to take on diesel oil and continued to sail further downstream.[115] During the night of 4 to 5 April 1944 the ship was anchored in Budapest. Her Commander reported that during slight air attack between 0.30 and 1.45 a.m. on 5 May 1944 the Bechelaren sustained no damage.[116]

It was written in the daily summary for 2 May 1944 that *„ship movements: Lower Hungarian area 11 towing vessels plus 19 tows. Serbian area: 9 towing vessels plus 40 tows. Total 79 vessels. MFTR Barge 802 sunk from tug convoy by 2 mines at km 1122. Towing vessel Spassoje* [?]*, belonging to Wasserstrassenverwaltung Belgrade was sunk by mine at km 1102. Tug Pudnik sunk from tug convoy by mine at km 1105"*. Concerning the closing of the Danube stretches it was reported: *„Danube at Regensburg, Braila and Theiss continues open. Only transfer ships* [Umsiedlungsschiffe, ships with refugees] *on the Lower Danube bound upstream are forbidden to proceed*."[117] We can only estimate that shipping of cargo vessels was so important that Command decided to risk it. Romanian General Staff of the Royal Navy also announced on 2 May 1944 that two magnetic mines of a new unknown type had been found in the Letea Forest.[118]

The ship movements increased on 3 May 1944: *„Hungarian area total of 146 vessels in both directions."* No mine was swept. Traffic on Serbian and Romanian part of the Danube River was most probably closed for shipping.[119]

Because of estimated mining of the river, the Danube stretch from Tulcea to Sulina on the Romanian territory was closed as ordered at 11.59 on 3 May 1944.[120] There was a strong suspicion that the entrance to Sulina Channel was mined during the night 2 to 3 May 1944.[121]

Daily summary of 4 May 1944 stated that in the *„Hungarian, Serbian and Upper Romanian Area a total of 345 vessels in both directions. The following were heavily damaged through striking mines on 4/5: at km 1151 (below Pancevo) 3 barges* [and] *at km 1109 1 barge from a tug convoy"*. Bulgarian R-boats were successful to explode three mines below the mouth of the Skit (rkm 685).[122] Slovak Dunajplavba River Shipping Company reported that DP6506 was heavily damaged by striking the mine nearby Pančevo on 4 May 1944.[123]

The next day, on 5 May 1944, it was reported: *„A total of 276 vessels in the Hungarian, Serbian and Upper Romanian areas in both directions. Towing vessel Erlau sank below*

[114] TNA, DEFE3/703, ZIP/ZTPGR/12236.
[115] TNA, DEFE3/703, ZIP/ZTPGR/12249.
[116] TNA, DEFE3/703, ZIP/ZTPGR/12491.
[117] TNA, DEFE3/703, ZIP/ZTPGR/12261.
[118] TNA, DEFE3/703, ZIP/ZTPGR/12321.
[119] TNA, DEFE3/703, ZIP/ZTPGR/12310.
[120] TNA, DEFE3/703, ZIP/ZTPGR/12320
[121] TNA, DEFE3/703, ZIP/ZTPGR/12331.
[122] TNA, DEFE3/703, ZIP/ZTPGR/12319.
[123] ŠAB, f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o XIX. zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL, ktorá sa konala v pondělok 8. mája 1944 o 17.40 hod. v spoločenskej miestnosti hotelu na Železnej Stúdničke v Bratislave and Zápisnica o XX. zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL, ktorá sa konala v útorok dňa 6. júna 1944 o 17.20 hod. v zasedacej miestnosti spoločnosti v Bratislave.

Kovin (km 1105).” No mine was swept.[124] Minesweeping aircraft deployed over the Danube Estuary were successful to sweep mines. Five of them were swept, one near mile 16 and mile 17 each and three mines in the Sulina roads on 5 May 1944.[125]

Guard ship Köln was being at war readiness on 5 May 1944 as it was reported by Danube Flotilla Headquarters at Linz. The ship was commissioned with colours. Command would like to send the vessel for minesweeping duties in the territory of Hungaryand/or Romania.[126] Early morning at 5.35 a.m. on 5 May 1944 Commanding Officer of Alberich Guardship reported: *„Report from River Police. 1) 2 Ships ran on mines at Bačka-Palanka yesterday afternoon. 2) Low flying A/C 7 to 12 kilometres downstream from Novi Sad last night. Danube presumably mined. Alberich requests orders, has commenced passage to Pančevo as there is no bread left and only 2 „Sea Cows” are serviceable.”*[127]

Royal Air Force renewed mining missions during the night of 5 to 6 May 1944 because they were aware of the increase of the Danube transport. Germans reported: *„Hungaria area: enemy incursions with dropping of numerous mines between Dunapentele (km 1580) nad Borovo (km 1342). Four of the mines exploding when dropped. Serbian area: incursion of enemy aircraft between Pancevo (km 1174) and Kovin (km 1110. Dropping of several mines established beyond doubt. One enemy aircraft shot down. Two mines dropped ashore near km 1146.”*[128] Commanding Officer of Iron Gate Group as well reported that by rkm 1170 nearby Bazias two enemy aircraft dropped mines.[129] Other three enemy aircraft dropped mines at 0.30 a.m. on 6 May 1944.[130] Another enemy bomber presumably dropped mines into the Danube river nearby Veliko Gradište. It happened between 11.45 p.m. and 0.30 a.m. on 6 May 1944. Air Gunners of this aircraft staffed Tatra steamer.[131]

And it was not the last drop. Three enemy planes dropped mines between rkms 1140 and 1146. Drop of 4 mines round rkm 1147 was clearly seen. Most probably in both cases at 0.30 a.m. on 6 May 1944.[132] At 1.15 a.m. on 6 May 1944 another mine was dropped nearby rkm 1062 not far from Kisiljevo (Serbia) and two more between rkms 1062 (Kisiljevo, Serbia) and 1075 (Ram, Serbia). Shipping on the Danube River was forbidden from Moldova (rkm 1049) to rkm 1595.[133]

The Royal Air Force in fact deployed 20 Vickers Wellington bombers of No 142 and No 150 Squadrons of No 330 Wing and 11 Liberator bombers of No 178 Squadron of No 240 Wing. No plane was lost. One of these missions was flown by Liberator B. Mk. VI bomber, serial number BZ930, captained by F/Lt. J. H. C. Lewis. The order was to

[124] TNA, DEFE3/703, ZIP/ZTPGR/12507.
[125] TNA, DEFE3/703, ZIP/ZTPGR/12522.
[126] TNA, DEFE3/703, ZIP/ZTPGR/12516.
[127] TNA, DEFE3/704, ZIP/ZTPGR/13313.
[128] TNA, DEFE3/703, ZIP/ZTPGR/12512 and ZIP/ZTPGR/11521.
[129] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[130] Ibidem.
[131] Ibidem.
[132] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[133] Ibidem.

mine the Danube River between Dunaföldvár and Fajsz in Hungary, some 50 kilometres stretch of the river. Plane took off at 7.57 p.m. from Celone Airfield in Italy. *„2111 hrs — road convoy seen heading South — position 43°30´N 17°00´ E (about 2-3 miles long). Lights seen flashing on and off along river. 2242 hrs, 175 ft — mined on heading 020°, IAS* [Indicated Airspeed] *170 mph. All splashes seen. First mine fell in area 360584, three seconds interval between rest. L.A.A.* Light-Anti-Aircraft] *battery, very accurate, from, opposite side of river slightly further North of DUPAVERE* [incorrect, most probably DUNAVECSE]*. L.A.A. also from DUPAVERE. Three direct hits on aircraft — two on part aileron and one on port rudder fin. Shrapnel through rear turret and fuselage. After mining rear gunner reported A.A. from DUPAVERE so continued North and turned left. Battery opened fire and aircraft went out of control. After control regained beam gunner called rear gunner. There was no reply and beam gunner examined rear turret and found rear gunner badly wounded. W/Op.* [Wireless Operator] *went to rear to help. Had to cut rear gunner´s shoe off to get him out. Second pilot* [P/O H. A. Melton, *went to help out as aircraft difficult to control he returned to own position. W/Op. and beam gunner removed rear gunner from turret and discovered severe wound in head. Administered oxygen, bandaged head and put all clothes over him from members of crew. He was breathing slightly for about half an hour but finally died about 2320 hrs. Mines carried 6 x 1000 lbs type A, Mark V,"* according to War Diary of No 178 Squadron. Aircraft landed with dead rear gunner at 01.25 a.m. at their base in Italy. The name of the rear gunner was F/O William Jck Allingham and he was a Californian served voluntarily with Royal Canadian Air Force. He was buried at Bari War Cemetery.[134]

Vessels of the Danube Flotilla were successful in minesweeping on 7 May 1944. Four kilometres above Veliko Gradište one mine exploded at 1.45 p.m.[135] At 10 a.m. another mine exploded nearby Ostrovo River Island, not far from Belobreșca on the other river bank. But most interesting for German specialists was that one dropped mine ended up on land. She was found with parachute some 200 meters from the Danube River bank nearby Zatonje in Serbia, rkm 1069. The mine did not explode. It was two meter long, cylinder form, diameter 50 centimetres and with an estimated weight of 350 kilogrammes. The mine was disarmed and FR-15 (das Flußräumboote, river minesweeper) embarked the mine and sailed her to Pančevo to study her.[136]

Next day's minesweeping continued. Another mine exploded during minesweeping at 6.30 a.m. between rkms 1062 (Kisiljevo) and 1069 (Zatonje) at 6.30 a.m. on 8 May 1944. Another was fished above Bazias in rkm 1070 at 8.30 a.m. on the same day. On 9 May 1944 one mine was annihilated during minesweeping at 11 a.m. and one west of Belobreșca.[137]

Commanding Officer of Bechelaren River Monitor (exCzechoslovak River Minitor President Masaryk) sent a message that a ship passed Komárno (Komorn) Harbour at

[134] TNA, AIR27/1120, Detail of Work carried out By No 178 Squadron R.A.F. For the Month of May 1944.
[135] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[136] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[137] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.

6 p.m. and sailed with approximate speed of 17 kilometres per hour (some 9 knots).[138] Ship would be used as a minesweeper and a guard ship on the Danube River. Two hours before ship passed rkm 1740.[139]

The Danube Flotilla reported at the evening 10 May 1944: *„A) 1) Reports of droppings in the Hangarian Area 9-10/5/44: Several droppings observed and presumed. Main Point of Effort between the Theiss Mouth (Km 1216) and Vukovar (Km 1336). Report of droppings in the Serbian Area: 2 droppings observed and 2 presumed. Main Point of Effort between Harsova (Km 245) and Km 252. Reports of droppings in the Upper Rumanina Area: observed between Km 901 and 895. 2) Traffic Reports outside the closed Stretch (Adony — Semlin) in the Hungarian, Serbian and Upper Rumanian Areas: 390 Vessels in both directions. On 10/5 a minelayer (M-Schiff) struck a mine near Berzina-Mare (Km 573) and sank* [...] *Mines swept: Danube Flotilla swept 2 mines near Sementira Island (Lower End — Km 1114) on 10/5. M/S aircraft in the area from Veliko Gradište (Km 1059) to Bazias (Km 1072) swept 3 mines on 9/5."*[140]

Slovak Dunajplavba River Shipping Company reported one of the worst days in company history. M-III motor vessel struck a mine near Turnu Măgurele in Romania. The cook was killed. Captain Alexander Starinský, one of the most skilled young officers of Dunajplavba, ordered to abandon vessel. At this moment, the vessel struck another mine and was again heavily damaged, causing 10 casualties and 2 wounded sailors. Captain Starinský was heavily wounded and died on the deck of M-III motor vessel half an hour after striking the mine. His body was later transported by a German ship to Svistovo Port in Bulgaria where he was buried in a cemetery.[141]

Danube Situation Report was issued at 10 p.m. on 12 May 1944: *„A) 1) In the Hungarian area, night of 10-11/5/44: Mines dropped near km 1408 and near km 1503-1507. In the Rumanian Area Night of 10-11/5/44: Mines presumed dropped near km 744 (Lom). 2) Traffic Situation: in the Hungarian, Serbian and Rumanian Areas as far as Braila, 488 Vessels in both directions. 3) 2 Tugs from tows damaged through striking mines near km 1080 on 12/5. Hospital Ship Jupiter heavily damaged and aground after striking a mine 5 km above Gradište at 1630/12/5. B) 1) Serbian Area: none. Rumanian Area: minesweepers Oder and Weichsel ground mine check sweep from Km 800 to 820. Further minesweepers Lavoisier and Descartes from Km 565 to 580. 2) 2 M/S A/C (Franzfeld) sample sweep from Moldova to Novisad and back on 12/5. No reports of operations from M/S A/C Craiova. C) No mines swept. D) Prohibition of shipping between Adony (Km 1598) and Vukovar (Km 1336) withdrawn at 0001/13/5. E) Ground mine Control: No reports of operation in the Lower Hungarina and Serbian Areas. No reports of the subject for the A/C flying low between Esseg (Drava) and Novi Sad (Km 1257) between 2140 and 2230 on 12/5* [...]*"*[142] Franzfeld A/F was situated East of

[138] TNA, DEFE3/704, ZIP/ZTPGR/13314.
[139] TNA, DEFE3/704, ZIP/ZTPGR/13289.
[140] TNA, DEFE3/704, ZIP/ZTPGR/13022.
[141] ŠAB, f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o XX. zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL, ktorá sa konala v útorok dňa 6. júna 1944 o 17.20 hod. v zasedacej miestnosti spoločnosti v Bratislave.
[142] TNA, DEFE3/704, ZIP/ZTPGR/13037.

village Kačarevo, Northeast of Pančevo, in Serbia. Craiova A/F was situated in Romania, on the place of contemporary Aeroportul International Craiova.

„Jupiter" Hospital Ship struck a mine between rkms 1060 and 1061 at 4.30 p.m. on 12 May 1944. „Alexandra" Guard Ship was sent to rescue survivors. But her departure was postponed and the ship started to sail only at 7.15 p.m. on 12 May 1944. Her Captain in Chief had a question, was passage to be continued during the hours of Darkness also?[143] He reported in the morning of 13 May 1944: *„Urgent rescue of wounded completed. The rest of Jupiter´s Crew will be transferred at 0700/13/5."*[144]

According to another report, a Hospital ship was sunk nearby rkms 1063 and 1064, five kilometres above Veliko Gradište. Of approximately 45 crew members and passengers, one non-commissioned officer drowned, four were badly wounded and three slightly wounded. The injured were taken to Veliko Gradište and then to a Field Hospital in Požarevac. The heavily damaged ship was not sunk but was grounded in the shallow water.[145]

Staff of the Danube Flotilla was not aware only of the enemy. German Naval Liaison Staff Rumania reported on 13 May 1944: *„1) Danube Flotilla Fuel Stocks will last for about 3 more weeks. Oil Supply from Turnu Severin as hitherto is no longer possible. 2) The Allocation of UTA with 230 cbm Capacity would ensure Oil Supply for minesweeping operations for a long Period. Naval Liaison Staff urgently requests that UTA be handed over. So that Freedom of Movement of the Danube Flotilla may be ensured. 3) Repair ship UTA would at the same time be a substitute for Belgrade Dockyard, which is out of action. Again, urgently request support, on account of importance for the War."*[146]

Other mines should have been dropped during the next night as reported: *„Hungarian Area: mines dropped by 1 or 2 A/C near Novi Sad (Km 1257) on the Night of 12-13/5. Croatian Area: mines dropped by 3-5 machines on the same night near Esseg (Drava). Bulgarian Area: mines dropped near Rahova (Km 678)."* Five minesweeping aircrafts based at Craiova A/F successfully swept 5 mines between Mohács (Km 1458) and above Baja (Km 1480). The Danube Stretch between Vukovar (Km 1336) — Semlin (Km 1174) was opened from 00.01 a.m. on 14 May 1944.[147]

Another message reported on 14 May 1944 that 1 tow proceeding upstream with provisions was sunk by a mine explosion near rkm 1474.[148] Another message reported that *„near Km 1550 2 tows, 1 empty, 1 with ammunition, struck a mine. In a sinking condition. Tug not damaged. 2 men dead, 1 wounded."*[149]

Staff Officer of the Danube Flotilla wrote in the Summary for 15 May 1944: *„A) 1) Hunga-*

[143] TNA, DEFE3/704, ZIP/ZTPGR/13058 and 13070.
[144] TNA, DEFE3/704, ZIP/ZTPGR/13057.
[145] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[146] TNA, DEFE3/704, ZIP/ZTPGR/13028.
[147] TNA, DEFE3/704, ZIP/ZTPGR/13036.
[148] TNA, DEFE3/704, ZIP/ZTPGR/13403.
[149] TNA, DEFE3/704, ZIP/ZTPGR/13453-

rian Area: dropping of mines observed several times on the night of 14-15/5 between Bačka — Palanka (Km 1301-1298). 2) Traffic situation: Ship Movement on 14/5 in the Rumanian Area between Moldova and Galatz: a total of 395 Vessels in both directions. Ship Movements in the Hungarian, Serbian and Upper Rumanian Areas on 15/5: a total of 154 Vessels in both directions. 3) 2 Vessels snak through striking mines near Km 1202. Vessel snak through striking a mine near Km 1474. 1 Vessel sank through striking a mine near Km 1548. 2 Vessels damaged through striking a mine near Km 1548. 1 Vessel damaged through striking a mine near Km 1550. 1 Vessel sank through striking a mine near Km 1550 [...]*"*[150]

German Liaison Officer by Hungarian River Forces reported on 15 May 1944: *„2 tanker tugs damaged by mine detonation near Km 1548 at 1300. 3 men wounded."*[151]

Inspector of Danube Minesweeping Service reported on 15 May 1944: *„Belgrade Degaussing Station will be ready for service on 20/5. The complete personnel which have so far been asked for without result (Officer Ic, Machine and Measuring Personnel for 2 shifts) has not yet arrived at Belgrade. The increasingly acute mine situation on the Danube and the supply traffic to be maintained in both directions require that the degaussing installation at Belgrade be put into operation at once. You are requested to arrange for the personnel asked for to despatched by air. Notification of departure is requested."*[152]

War Diary of Officer in Command of Iron Gate Group mentioned that two barges in tow were sunk on the Danube River on 16 May 1944. D.D.S.G. 65159 barge at 13 p.m. nearby rkm 1080/1081. This barge was loaded with peas and barge J.R.P. (Jugoslovenska rečna polvidba) 26565 which sailed nearby was loaded with chrome ore. Two sailors drowned, one was badly wounded and three were slightly wounded.[153]

A total of 309 Vessels sailed in the Upper Rumanian Area on the Danube River on 16 May 1944.[154] It was presumed that during the night of 15/16 May 1944 some mines were dropped because of incursion of four to six aircraft into the Vukovar (rkm 1336) and Esseg (Osijek) (rkm 670) Area. Several vessels struck mines: D.D.S.G. 65159 barge near rkm 1082 (total loss), Creszenz-Wallner near rkm 1547 (total loss), Slovak SPD150 barge carrying ammunition near rkm 1569 (total loss), M.F.T.R 720 barge carrying coal near rkm 1549 (total loss), KT33 near rkm 1153 (damaged), JRP 26565 barge near rkm 1082 (damaged), Romanian Comos XVI river tanker near rkm 1569 (damaged) and D.D.S.G. 09714 barge near rkm 1569 (damaged). Mine sweeping aircraft during a sample sweep between Pančevo — Moldova Veche swept four mines.[155] Creszenz-Wallner motor towing vessel had in tow D.D.S.G. 10023 barge and Comos XXXVIII river tank barge. SPD 150, M.F.T.R. 725, D.D.S.G.9714 were all in tow of Szigliget Hungarian steamship.[156]

[150] TNA, DEFE3/704, ZIP/ZTPGR/13396.
[151] TNA, DEFE3/704, ZIP/ZTPGR/13413.
[152] TNA, DEFE3/704, ZIP/ZTPGR/13492.
[153] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[154] TNA, DEFE3/704, ZIP/ZTPGR/13345.
[155] TNA, DEFE3/704, ZIP/ZTPGR/13341.
[156] TNA, DEFE3/704, ZIP/ZTPGR/13335.

Next day, 445 vessels sailed in the Hungarian, Serbian and Upper Romanian Area. All in all, one Vessel Slovenac was total lost and barges WT130, Comos L7 and IRT 11002 were damaged on 17 May 1944, all near rkm 1134. One mine was swept by Hungarian assault boats.[157] Grein Passanger ship operating as towing vessel was sunk by mine near Apatin, rkm 1398, at 11.30 a.m. on 17 May 1944. Bow was torn away and ship sank. Three empty barges were in tow and left undamaged.[158] D.D.S.G.9722 river tank barge struck a mine at 0.15 p. m. on 18 May 1944. She was damaged at the stern and grounded by rkm 1551 where the accident happened.[159]

The traffic on the Danube River started to decrease at the end of May 1944. A total of 241 vessels was reported in the Upper Romanian Area, 30 vessels in the Hungarian Area and 11 vessels in the Serbian Area on 20 May 1944 and 293 vessels in the Upper Romanian Area, and 1 vessel in the Hungarian Area on 21 May 1944.[160] BP Baja and D.D.S.G. 65167 barge were lost near rkm 1276 (Cerevis) on 19 May 1944 and D.D.S.G.09767 barge and NT87 vessel were damaged by mines nearby rkm 1084 (Dubovac) on 20 May 1944. One mine was swept in the Hungarian Area by river forces.[161] Another report claimed that BP Baja barge and D.D.S.G.65767 barge, each loaded with 500 tons of peas, were in tow of Hungarian Tatra steamship when they stroke a mine. Steamship sailed upstream. Both barges were sunk at rkm 1276.[162]

The situation of fuel for vessels of the Danube Flotilla was critical as well. German Naval Liaison Staff in Romania was asked in the afternoon on 20 May 1945 that *„Danube Flotilla urgently requires 100 cbm. Diesel fuel. Request you arrange despatch of such quantity by lorry from Rumania to Pančevo* [...] *As a result of the mining situation, taking on from Turnu Severin by vessels is impossible."*[163]

Slovak M-IV cargo motor vessel sailed upstream on 21 May 1944. It struck a mine between Kalocsa and Paks, nearby Foktő village and was heavily damaged. The Cook and her helper were killed. Crew could outmanoeuvre the vessel and grounded her in the shallow water by stern of the boat.[164]

Another dropping of mines was observed during the night of 21/22 May 1944. Six to eight enemy aircraft operated according to German Inspector of Danube Minesweeping Service in Croatian and Serbian Area between Vukovar (rkm 1336) — Pančevo (rkm 1154) — Semlin (rkm 1257). Three minesweeping aircraft flew on missions along Danube. One mission was a sample sweep between Pančevo (rkm 1154) and Budapest in the morning, second was a sample sweep between Budapest and Pančevo in the afternoon and the third mission had the same character between Pančevo as far as 5 km above Semlin (rkm 1174) in the evening. One plane was successful to sweep two mines nearby rkm 1231.[165]

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[157] TNA, DEFE3/704, ZIP/ZTPGR/13345.
[158] TNA, DEFE3/704, ZIP/ZTPGR/13344.
[159] TNA, DEFE3/704, ZIP/ZTPGR/13469.
[160] TNA, DEFE3/704, ZIP/ZTPGR/13533 and 13532.
[161] TNA, DEFE3/704, ZIP/ZTPGR/13532.
[162] TNA, DEFE3/704, ZIP/ZTPGR/13468.
[163] TNA, DEFE3/704, ZIP/ZTPGR/13582.
[164] ŠAB, f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o XX. zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL, ktorá sa konala v útorok dňa 6. júna 1944 o 17.20 hod. v zasedacej miestnosti spoločnosti v Bratislave.
[165] TNA, DEFE3/704, ZIP/ZTPGR/13600.

The Chairman of Reichswerke AG für Binnenschiffahrt „Hermann Göring“ Shipping company Rudolf Diels reported on 22 May 1944 that this company lost total cargo of 80 thousand tons because of the mining of the Danube river ships. Other companies also had heavy losses, such as German Donaudampfschifffahrt Gesselschaft (acronym D.D.S.G.), Südost-Reederei Belgrad (acronym S.O.R., part of D.D.S.G.) and Bayerischer Lloyd Schiffahrtsgesselschaft (acronym B.L.), Slovak Slovenská Dunajplavba (acronym D.P.) and Hungarian Magyar Királyi Folyam- és Tengerhajózási Részvénytársaság (acronyms MEFTER and/or M.F.T.R). All in all, 69 people had died. It was reported that during 22 May 1944 other seventeen ships were sunk and/or damaged, causing 8 dead and 5 wounded. Further shipping companies were employed on the Danube river as well: Romanian Societatea Anonimă Română de Navigațiune pe Dunăre (acronym S.R.D.), former Yugoslavian Jugoslovenska rečna polvidba (acronym J.R.P.), former Austrian Braun & Piry Binnenschiffahrtsgesselschaft (acronym B.P.) and former Dutch-Austrian Die Continentale Motorschiffahrts A.G. (acronym C.O.M.O.S., part of D.D.S.G.).

German Chief Transport Officer Hungary reported on 22 May 1944 that two ships struck the mines, both near rkm 1516. They were SPD 4 tanker motor vessel and JRP PN-2 tanker. Both were proceeding upstream and carried oil. A Slovak ship was beached on sand bank and left burning and a former Yugoslavian one exploded and immediately sunk.[166] According to the supplement of Daily Summary for 22 May 1944, one towing vessel was sunk by a mine near rkm 1509 (Fadd-Tolna in Hungary), one tanker motor vessel was beached in flames near rkm 1516 (Gerjen in Hungary), and another tanker was sunk. 287 vessels sailed in the Upper Rumanian Area of the Danube River on 22 May 1944.[167]

The same Officer added that other vessels were sunk and/or damaged by mines on 22 May 1944. They were DDSG 67112, J.R.P. 26614, J.R.P. 27322, J.R.P. 26622 cargo barges which were in tow by Werdenstein steamship and proceeding upstream and S.O.R. 19801, DDSG 67256 and BL 53 tanker barges in tow of Haustein motor towing vessel proceeding downstream. First tow struck mines nearby river 1458 with following results: DDSG 37112 severely damaged and beached, J.R.P. 26614 could not be steered and left afloat and another two barges were slightly damaged in the bow and stern. All the boats of second convoy in tow of Haustein motor vessel struck mines near rkm 1540. S.O.R. 19801 was severely damaged and beached, other two vessels had a steering position damaged. It is interesting what cargo was in the barges: all of the vessels in the first convoy were loaded with Industrial goods (Wi-Güttern, Wirtschaft-Güttern). Concerning the second convoy, S.O.R. 19801 it was loaded with state monopoly coal, DDSG 67256 with ammunition and BL 53 had on the deck loaded cargo of gun barrels.[168] Another motor towing vessel was sunk by a mine near rkm 1509. This vessel was proceeding upstream and none of the barges in tow were sunk or damaged.[169] The Danube River was closed for traffic between Novi Sad (rkm 1257) and Semlin (rkm 1174) to shipping from 00.01 a.m. on 23 May 1944.[170]

[166] TNA, DEFE3/704, ZIP/ZTPGR/13649.
[167] TNA, DEFE3/704, ZIP/ZTPGR/13591.
[168] TNA, DEFE3/704, ZIP/ZTPGR/13599.
[169] TNA, DEFE3/704, ZIP/ZTPGR/13595.
[170] TNA, DEFE3/704, ZIP/ZTPGR/13596.

Some other reports on sinking and damaged vessels came from Daily Summary for 23 May 1944. This message was not deciphered exactly so some parts of this message are missing. Nevertheless, one towing vessel was sunk by rkm 1465 (Báta in Hungary) and one patrol boat with *„KMK"* was most probably damaged, both by mines. Three minesweeping aircraft were engaged in three missions, one of them from Pančevo to Budapest. Two mines were swept, one nearby rkm 1272 and second one near rkm 1558.[171]

According to the daily summary for 24 May 1944 no mines were dropped. Traffic was closed between Novi Sad and Semlin. All in all, 301 ships moved in Upper Rumanian Area, 37 ships in Hungarian Area and none in Serbian Area. Supplement to 23 May 1944 added that *„Serbian area 4, Hungarian area 2"* ships sailed.

Three mine-sweeping aircraft carried out a mission between Pančevo in Serbia and Budapest and back. One mine was swept by an aircraft near rkm 1586.[172]

Only on the stretch of the Danube River between Moldova (rkm 105) and Galați (1049) 381 vessels sailed on 24 May 1944 and the next day 301 vessels.[173]

Situation on the Danube River became worse. It was confirmed by one message sent by Lieutenant-Commander Lautenschläger in the afternoon on 24 May 1945: *„The Danube situation has become more acute through the non-arrival of minesweeping gear ordered 3 weeks ago. Some converted vessels are lying idle. According to conversation with Mining and Barrage Inspector the minesweeping gear applied for is in the store at Mining and Barrage Arsenals and ready for transport, but has not yet been sent owing to lack of transport facilities. Request that the question of A/C transport may be examined again."*[174]

It was estimated that during the night of 24/25 May 1944 mines were dropped nearby Apatin in Serbia (rkm 1406). Shipping was decreasing as was reported: 9 vessels in the Upper Romanian Area, 7 vessels in the Serbian Area and 44 vessels in the Hungarian Area in both directions. One mine was swept by aircraft nearby rkm 1453.[175]

Hungarian River Forces reported during the evening of 25 May 1944 that two mines were dropped above Apatin, nearby rkm 1486, at 0.30 a.m. This mission was carried out by two enemy planes which flew in altitude about 100 metres. Two mines fell into the river, approximately 300 metres from the right bank.[176]

The German Command assumed that other mine-dropping happened during Night 25/26 May 1944. Observation was from the stretch between Vrf (rkm 840) and Novo Selo (most probably Bačko Novo Selo) (rkm 843) and Vidin (rkm 791) and Calafat (rkm 795). Shipping weas closed so in the comparison with last days no vessels sailed

[171] TNA, DEFE3/704, ZIP/ZTPGR/13591.
[172] TNA, DEFE3/704, ZIP/ZTPGR/13673.
[173] TNA, DEFE3/704, ZIP/ZTPGR/13735.
[174] TNA, DEFE3/704, ZIP/ZTPGR/13590.
[175] TNA, DEFE3/704, ZIP/ZTPGR/13674.
[176] TNA, DEFE3/704, ZIP/ZTPGR/13671.

in Hungarian and Serbian areas and only 5 ships on the Upper Rumanian stretch of the river.[177] According to the supplement, 22 vessels in both directions sailed in the Hungarian area.[178] In fact, the Danube River weas closed to shipping between Semlin (rkm 1174) and Novi Sad (rkm 1257) and between Mohács (rkm 1448) and Harta (rkm 1547).[179]

Conversion of the river minesweepers continued. According to the report of 26 May 1944: *„The preparation of FR-boats* [das Flußräumboote, river minesweepers] *is being delayed by agreement with Engineer overseer Linz* [...] *Firms are endeavouring to produce a suitable starter by conversion. Continues are being used for delivery. Completion of boats is dependent on delivery of starter and electrical instruments. Engineer overseer Linz is making every endeavour to obtain both. In view of the electrical work still to be carried out. Basin trials etc., completion of FR-boats can be expected 2 weeks after receipt of starter."*[180]

Traffic was not significantly changed on 27 May 1944. In the Hungarian area, 6 vessels in tow traffic and in the Upper Rumanian area 315 ships and boats sailed in both directions. Minesweeping aircraft from Franzfeld A/F and Craiova A/F were active. One mine was swept at rkm 1455 and one nearby rkm 1345 (Dunaszekcső).[181]

The report of 27 May 1944 on Royal Hungarian River Forces is interesting: *„So far Hungarian assault boats with M. St. G.* [das Magnetstabgerät — German Sweeping Gear] *have been used. There is still acoustic gear ready for use. 8 tugs still being used. 3 sets of S.S.G.* [das Schleppspulgerät — German Sweeping Gear] *arrived from Constanza today. They are being installed during the holidays. Operation of the tugs equipped is being discussed here with the Inspector personally."*[182]

All in all, 323 vessels were present in the Upper Rumanian area on 28 May 1944, while no ship was reported from Hungarian and Serbian area. Minesweeping on Hungarian part of the Danube River was postponed because of installation of gear on the vessels. Nevertheless, minesweeping aircraft were successful to swept two mines nearby rkms 1551 and 1393.[183]

Another drop of mines was reported *„during Night of 28-29/5 2-3 A/C between Esseg and Vukovar. Mines presumably dropped. Similarly neat km 1386 mouth of the Drava and near Esseg in the Drava 18 km from mouth. Further dropped near Dalja (km 1355) and mines were seen to drop below the bridge of Bogojevo (km 1367)"*[184] It was the first time to report mining the Drava River but the Royal Air Force aircraft had no order to bomb this river. So, in fact it was a mistake from Royal Air Force side.

[177] TNA, DEFE3/704, ZIP/ZTPGR/13735.
[178] TNA, DEFE3/704, ZIP/ZTPGR/13374.
[179] TNA, DEFE3/704, ZIP/ZTPGR/13735.
[180] TNA, DEFE3/704, ZIP/ZTPGR/13757.
[181] TNA, DEFE3/704, ZIP/ZTPGR/13734.
[182] TNA, DEFE3/704, ZIP/ZTPGR/13763.
[183] TNA, DEFE3/704, ZIP/ZTPGR/13767.
[184] TNA, DEFE3/704, ZIP/ZTPGR/13768.

The prohibition of shipping from Semlin (rkm 1174) to Harta (rkm 1547) had been cancelled from 0.01 a.m. on 30 May 1944.[185] The state of the minesweeping forces as was reported on the same day: *„A) tanker tugs Condition of Clearance Vessels ready for operation (and addition):*

1) Own:

A) Central Danube from Pressburg (Km 1865) to Moldova Veche (Km 1049): 3 Vessels with magnetic sweeping gear.

B) Lower Danube from Moldova Veche to the Estaury: 6 Vessels

2) Foreign:

A) Hungarian River Forces on the Hungarian Danube: 20 Assault Craft with „M. St. G."

B) Rumanian Danube Division on the Rumanian Danube: 4 Clearance Vessels.

Planned:

1) Own: 8 more in the Central Danube. General plan for own Clearance Vessels: 48 on the Danube from the Estuary to Regensburg.

2) Foreign: Hungarian: 8 more. Rumanian: 5 more.

All the Clearance Vessels planned will arrive during the 8 Weeks beginning at the end of this week. As necessary conversion and, where required, equipping with Clearance Gear, is completed. The Clearance Gear under consideration for all Vessels is „HFG", „FRG" and „SSG". Procuring of further Clearance Vessels is in Progress.

M/S [minesweeping] *A/C* [aircraft]

A) Central Danube: 7

B) Lower Danube: 8

Planned:

Further addition of 5 M/S A/C on the Central Danube"[186]

At the beginning of June 1944, the Supreme Command of German Air Force decided to deploy other Night Fighter Squadrons to Hungarian Area. Finally, it was decided to use Steinamanger (Szombathely) A/F in West Hungary. But first of all, these planes operated mostly against the Royal Air Force Bombers from Italy against targets in Styria, Lower Austria (Ostmark) and Hungary and Soviet Bombers from East attacking targets in Hungary.

The first transfer of seven Messerschmitt Bf 110 Night Fighters of III. Gruppe Na-

[185] TNA, DEFE3/704, ZIP/ZTPGR/13788.
[186] TNA, DEFE3/656, ZIP/ZTPGM/73665.

chtjagdgeschwader 6 (III./NJG 6) from Hagenau A/F in Alsace to Steinamanger A/F begun on 1 June 1944. It was continued in the next days. Other four aircraft were transferred on 2 June 1944. It was decided on 17 June 1944 to transfer the rest of III./NJG 6 to Steinamanger A/F and to make Hagenau A/F free to be used by Stab and II. Gruppe Nachtjagdgeschwader 5. First victories of III./NJG 6 operating from Steinamanger A/F came during the night of 26 to 27 June 1944. But there is no evidence that some of the victories of this unit belonged to the Royal Air Force bomber deployed on mining of the Danube River until End of August 1944.[187]

Operations by minesweeping aircraft during the day, mostly in morning and late afternoon, were not so safe as expected. Superiority of the Allied Air Forces became clear. One Junkers Ju 52 MS minesweeping aircraft was shot down at 8.15 a.m. on 6 June 1944. One airman was killed, one was badly wounded, and two airmen were slightly wounded. Aircraft crashed between Veliko Gradište and Požeženo. The wounded were taken through Veliko Gradište to Požarevac Field Hospital.[188]

The victor was surely an American fighter 1st Lt. James W. Stegman of 96th Fighter Squadron 82nd Fighter Group of 15th Air Force of the United States Army Air Force. He piloted Lockheed P-38 Lightning twin-fuselage fighter and claimed *„Ju 52, anti-mine, NW of Turnul Severin"*, which was in fact the wrong location. Presumed location lies some 90 kilometres East of Veliko Gradište. Any other plane of this special type was not shot down on this particular day. Stegman was on a mission between 6.15 and 11.09 a.m. on 6 June 1944. It was Stegman´s second and last victory during World War 2. He claimed first kill couple of days ago when he shot down Fieseler F 156 liaison aircraft *„5 m NE of Kostajnica"* in Croatia on 29 May 1944.[189]

A Danzig motor vessel was sunk by a mine near rkm 1026 at 7.30 a.m. on 16 June 1944, the barge in tow was undamaged. Five sailors were injured, three of them badly wounded.[190] Another goods barge was damaged near rkm 1723 on 19 June 1944.[191]

The Danube Situation Report of 20 June 1944 claimed that 121 vessels on the Central Danube and 7 vessels on the Lower Danube sailed. Minesweeping vessels were deployed between Bratislava (Preßburg), Budapest and Belgrade (11 ships) on the Central Danube and 4 vessels between Turnu Severin and Ruščuk on the Lower Danube. Minesweeping aircraft conducted sweeps of Budapest to rkm 1800 (7 planes), Budapest — Pančevo (1 plane), Pančevo — Budapest (3 planes), Pančevo — Moldova (2 planes), Orehova — Linova (rkm 735) (1 plane), Turnu — Magurelle — Orehova (2 planes) and Orehova — Girugiu (1 plane). Operation off Turnu-Severin was broken off owing to bad weather. The state of the minesweeping aircraft was as follows: Franzfeld 5 Junkers Ju 52 MS, 3 in operation and Craiova 3 Junkers Ju 52 MS ready. Only river minesweepers

[187] BA/MA. RL10/542.
[188] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[189] OLYNYK, Frank J., Victory List No. 6. USAAF (Mediterranean Theatre) Credits for Destruction of Enemy Aircraft in Air-to-Air Combat World War 2. Published by Author June 1987, p. 86.
[190] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[191] TNA, DEFE3/704, ZIP/ZTPGR/13808.

were successful and destroyed 1 mine near rkm 1789, two mines near rkm 1202, one mine at rkm 1208 and two mines near rkm 1192.[192] One tug was sunk by a mine nearby rkm 1488 on 20 June 1944.[193]

Next day the traffic on the Danube River increased. It was reported there were 180 vessels on the Middle Danube and 55 vessels on the Lower Danube. The German Command deployed both river minesweepers and mine-sweeping aircraft, but only ships were successful. They deployed 6 vessels and 7 Hungarian assault crafts between Bratislava and Budapest on the Middle Danube, 3 Hungarian assault crafts south of Budapest, one vessel from Belgrade to rkm 1217, one vessel from Belgrade to rkm 115, two vessels on the Lower Danube and 3 vessels in the Cataract stretch for these duties. Two mines were swept nearby rkms 1723 and 1730.[194]

81 vessels sailed on the Lower Danube on 24 June 1944. Next day there were 188 vessels on the Middle Danube reported. Three dumb barges were damaged by rkm 1540 on 25 June 1944. Although 19 river minesweepers and 13 minesweeping aircraft were deployed, no mines were swept.[195]

A Summary report on dropped mines and the possibilities of how they could be swept was issued on 26 June 1944: *„It is clear that enemy has used so far ELM/I (275 kg charge) on the Danube* [German Acronym for British Mark V Anti-Shipping Mine]*. Fittings: „DK, „VK", „ZKVW". ELM/I (325 kg charge), ELM with Acoustic or Combined firing not observed. Sweeps used:*

HFG 24 M [das Hohlstab-Fernräumgerät — German Sweeping Gear]

HFG 12 M [das Hohlstab-Fernräumgerät — German Sweeping Gear]

SSG [das Schleppspulgerät — German Sweeping Gear]

FRG [das Fernräumgerät — German Sweeping Gear]

M. St. G. [das Magnetstabgerät — German Sweeping Gear]

GBT [die Geräuschboje Turbine — German Sweeping Gear]

KKG [das Knallkörpergerät — German Sweeping Gear]

and M/S aircraft.

Use of the only „HFG 24 M" so far has shown particularly good results. 28 Successes between 4/6 and 23/6 with it. No Opinion on „HFG 12 M" as the only outfit was seriously damaged after 3 Successes. Use of „SSG" difficult in view of shallow water. Cables often broke due to fouling the bottom despite shortest pendant and use of cutting floats instead of cutting kites. Inferior breadth swept and resistance to detona-

[192] TNA, DEFE3/704, ZIP/ZTPGR/13803 and 13808.
[193] TNA, DEFE3/704, ZIP/ZTPGR/13808.
[194] TNA, DEFE3/704, ZIP/ZTPGR/13808.
[195] TNA, DEFE3/704, ZIP/ZTPGR/13814.

tion accepted in view of shallower depth keeping. Where „SSG" still has to be used in default of more suitable gear, attempts to ensure shallower depth-keeping are made by inserting additional floats. „FRG" suitable here by reason of shallower draught. Successfully used so far. A disadvantage is its slight resistance to detonations. Boats often lost. „M.ST.G." used in Hungarian Assault Boats downstream only. Between 10/5 and 24/6 20 Successes. M/S aircraft have been successfully used. All sweeps except „M.ST.G." used up and downstream [...]

Sweeping Vessels: Tugs from Danube Shipping. Risk to sweepers at a depth of water of 3,6 metres very high. Have therefore requested 30 „VES" Sperrbrecher [MFP = Marinefährprahm, Navy Ferry Barge]*."*[196]

The same day it was reported that Danube Flotille, Iron Gate Group, consisted of two „great" warships Tronje and Alexandra and two „small" warships Fafner und Fasolt. From this date, the group was enlarged by a warship Uta (21 June 1944) and Nothung (24 June 1944) and two river minesweepers FR-4 and FR-8. But Uta deposit ship stood in Iron Gate Group only until 26 June 1944 when she was deployed to other part of the Danube River.[197]

German Gunther River minesweeper stroke mine at rkm 1086 on 27 June 1944. She became totally lost.[198] She *„sank today when minesweeping"* as was reported.[199] Guardship Gunther lay sideways in the midstream above Moldova Vecche. Depth of the water in this place was 8 metres. 14 men were killed, 5 wounded and 3 rescued.[200] Next day, on 28 June 1944, another vessel was sunk at rkm 1736.[201]

All in all, there were 60 vessels on 28 June 1944 and 50 vessels on 29 June 1944 on the Lower Danube.[202] The German Command assumed mine-dropping took place nearby Oltenita (rkm 430), Svistov (rkm 555), Orehova (rkm 578) and Calafat (rkm 795) on 29 June 1944. Two tugs and one barge were sunk by mines at rkms 1742, 1778 and 1781. Only two mines were swept by ships at rkm 1276.[203] According to an additional report, two more mines were swept by river minesweepers at rkm 173 and on the Theiss river at rkm 228.[204]

Mines were dropped presumably during Night 29/30 June 1944 nearby rkm 1052 (Moldova Veche).[205] The German Command presumed that mining happened during Night 29/30 June 1944 between Novi Sad and Belgrade and between Lom Calafat and on the Sava River between rkms 55 and 200. Two tank barges sunk after striking mines near rkm 1224. Only one mine was swept by ships at rkm 1277 on 30 June 1944.[206]

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196 TNA, DEFE3/661, ZIP/ZTPGM/78314.
197 BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
198 TNA, DEFE3/704, ZIP/ZTPGR/13815.
199 TNA, DEFE3/704, ZIP/ZTPGR/13817.
200 TNA, DEFE3/704, ZIP/ZTPGR/13816.
201 TNA, DEFE3/704, ZIP/ZTPGR/13819.
202 TNA, DEFE3/704, ZIP/ZTPGR/13820.
203 TNA, DEFE3/704, ZIP/ZTPGR/13819.
204 TNA, DEFE3/704, ZIP/ZTPGR/
205 BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
206 TNA, DEFE3/704, ZIP/ZTPGR/13820.

The Royal Air Force had heavy losses during mining of the Danube River during the night of 1/2 July 1944. They lost four bombers and at least two planes were damaged. Bombers belonged to Nos. 40 and 104 Squadrons of the Royal Air Force.

No. 40 Squadron was deployed to mine the Danube River between Smederevo and Pancevo during the Night of 1/2 July 1944. As is written in the War Diary of the mentioned Squadron concerning Vickers Wellington B. Mk. X bomber serial number ME960, code BL-U *„heading 225°, dropped 2 mines. Intense defences from just N. of Belgrade and S/L´s* [searchlights]*. Aircraft hit near Smederevo and rear gunner (Sgt. Harwood) killed. Body brought back to base."* It was similar with Wellington B.Mk. X bomber, serial number LN652, code BL-S: *„Heading W. upstream 2 mines dropped in river in bed 15 deep. Hydraulics to rear turret shot away.*"

Two planes were missing and no news were about them in No. 40 Squadron: Vickers Wellington B. Mk. X bomber serial number LN744, code BL-N (Sgt. W. Booth, Sgt. W. Goodbrand, Sgt. M. Mason, Sgt. L. Wetherill, Sgt. A. de Shrynmakers, Belgian served with Royal Air Force) and Vickers Wellington B. Mk. X bomber serial number LP497, code BL-A (Sgt. G. Waddell, F/Sgt. H. Davidson, F/Sgt. T. Hardwick, F/O J. Campbell, Sgt. K. Whitnall). Crew of Wellington B. Mk. X bomber, serial number LN974, BL-H reported *„a/c seen to burst into flames at 200 ft. between Pancevo and Bed."*[207]

No. 104 Squadron had the same task, only in the other stretch of the Danube River. Wellington B. Ml. X, serial number LP508, code EP-J reported *„target identified, and mines laid. 6 – 10 search lights at several positions along the banks. M.E.110* [Messerschmitt Bf 110-night fighter] *seen heading for aircraft, evasive action taken and aircraft not seen again"*. Two *„aircraft did not return from operations. No further news received"*. They were: Vickers Wellington B. Mk. X bomber serial number MF137, code EP-H (F/Sgt. E. J. Holmes, F/Sgt. K. G. Kingerlee, F/Sgt. K. N. Wiggins, F/Sgt. E. W. Morgan, Sgt. G. Parker) and Vickers Wellington B. Mk. X bomber serial number LP151, code EP-L (Sgt. L. W. Hunt, Sgt. K. Lovatt, Sgt. J. R. Breeze, Sgt. T. T. Golding, Sgt. R. Furlong).

Wellington B. Mk. X, serial number LN754, EP-X, reported *„6 – 8 Searchlights and Light A. A.* [Anti-Aircraft] *Guns engaged aircraft. Bomb bays and starboard opposite Cockpit, Hydraulic shot away and tail wheel damaged on landing. Navigator seriously injured. Navigator gave course fro homeward journey to the crew who returned by map reading with assistance of QDM´s* [Magnetic heading]*. 1-mine jettisoned, 1-mine hung up."*[208]

According to German sources, two German Anti-Aircraft units claimed each one Wellington bomber. Both cases supposedly happened in Dublje area in Central Serbia, some 120 kilometres South of Smederevo and the bank of the Danube River. First victory was claimed by 4./gemischte Flak-Abteilung at 11.54 p.m. and other one by

[207] TNA, AIR27/413, Detail of work carried out by No. 40 Squadron RAF for the Month of July 1944.
[208] TNA, AIR27/822, Detail of work carried out by No. 104 Squadron RAF for the Month of July 1944.

1./schwere Flak-Abteilung 549 at midnight on 1 July 1944. Why the other two aircraft crashed is uncertain.[209]

The Inspector of Danube minesweeping service reported that 68 vessels sailed on the Lower Danube on 1 and 2 July 1944 and only 2 vessels on the Middle Danube on 3 July 1944.[210] One ship, probably with a name Gročka, became a total loss after striking two mines near rkm 1123 on 2 July 1944. Or maybe it happened near Gročka - because of an incomplete deciphered message it is not clear.[211] According to a German report, 12 to 15 aircraft dropped about 20 mines between 0.01 and 1.30 a.m. on 3 July 1944. There were observed nine mines at river mark 690, two to three mines at rkm 670, two to three mines at rkm 744 and others near rkms 525 and 535. Three mines self-detonated at rkm 690. Four mines swept Bulgarian clearing vessel Isker on 3 July 1944.[212]

Another disaster for Slovak Dunajplavba River Shipping Company came on 3 July 1944. Some 30 kilometres off Smeděrevo convoy sailing upstream struck the mines. Ressel motor towing vessel was undamaged but all the three barges in tow were hit by mines. DP7207 and DP7216 were sunk and DP7718 heavily damaged. Last reported barge was grounded in the shallow waters 23 kilometres off Smeděrevo.[213]

Two tank barges were damaged by mines at rkm 746 on 5 July 1944. Traffic situation was 144 vessels on the Middle Danube on 6 July 1944. Ships swept one mine at rkm 1572 on the same day.[214] Three empty tank lighters were sunk on a passage downstream at rkm 746,5 on 6 July 1944, approximately in the same position as the previous day.[215]

Stad I river tanker was heavily damaged by a mine on 13 July 1944 near rkm 1026, not far from village Dobra in Serbia. This vessel towed six barges which were left undamaged. The tanker was towed by Srbija tug to Drenkova. Two sailors were badly wounded. Six barges were left in the place of the accident, anchored by rkm 1025 and guarded by a warship. These barges were empty.[216]

Two dumb barges were sunk at rkm 1084 on 17 July 1944. Next day, an intensive minesweeping was carried out by ships and aircraft. Vessels were successful to sweep two mines nearby rkms 1521 and 1522.[217] 103 vessels sailed on the Lower Danube on 20 July 1944 and 29 vessels on the Middle Danube on 21 July 1944. One vessel was damaged by a mine at rkm 1571 on 21 July 1944. On the same day, intensive minesweeping was conducted both by ships and aircraft. Ships were successful in destroying one mine at rkm 1237, two mines at rkm 1261 and four mines at rkm 1693. It was thought that mines were dropped during the night of 20/21 July 1944 between rkms 1270 and 1180.[218]

[209] BA/MA, RL5/1451, 1. 7. 1944.
[210] TNA, DEFE3/704, ZIP/ZTPGR/13833.
[211] TNA, DEFE3/704, ZIP/ZTPGR/13834.
[212] TNA, DEFE3/704, ZIP/ZTPGR/13832.
[213] ŠAB, f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o mimoriadnom zasadnutí SLOVENSKEJ DUNAJPLAVBY, ÚČ. SPOL. v Bratislave, ktorá sa konala v útorok dňa 11. septembera 1944 v zasiadacej sieni spoločnosti.
[214] TNA, DEFE3/704, ZIP/ZTPGR/13831.
[215] TNA, DEFE3/704, ZIP/ZTPGR/13830.
[216] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[217] TNA, DEFE3/704, ZIP/ZTPGR/13829.
[218] TNA, DEFE3/704, ZIP/ZTPGR/13828.

During the night of 30/31 July 1944, the drop of mines around midnight was reported. Seven mines were reported to be dropped in the Danube River between Orșova (Rumanian) and Tekija (Serbia), rkms 956/955. These two places are situated on the opposite banks of the Danube River. Other two mines were dropped mistakenly on land, near southwest entry to Orșova harbour. According to the later report there were in fact dropped three bombs which were secured and sent to Belgrade. It was as well reported that between Požežana (rkm 1055) and Moldova Veche (rkm 1048) around midnight presumably 19 mines were dropped by three aircraft. One sailor reported that he saw 16 mines in the water. Three others were found on the land, one 50 metres from riverbank near rkm 1055 and two other mines 200 metres from river bank near rkm 1051.[219] Most probably one of the mines dropped during this night exploded on 2 August 1944 near rkm 1040, below Golubac. The water column after explosion reached approximately 30 meters.[220]

The mining of the river restricted shipping. It is clear from the report of Slovakian Dunajplavba River Shipping Company. There were on average 110 thousand tons of oil shipped from Giurgiu Port in Romania monthly until April 1944. It was decreased to 35 thousand tons in May 1944, to 33,6 thousand tons in June 1944, increased to 59,5 thousand tons in July 1944 and once again decreased to 35 thousand tons in August 1944. Because of the war and political situation, the shipping of oil from Romania on the Danube River was closed at the end of August 1944.[221]

The fourth phase of the Royal Air Force mining mission continued between 1 and 3 July 1944, the fifth one between 29 July and 10 August 1944, the sixth one between 27 August and 10 September 1944 and the last one, the seventh, between 30 September to 7 October 1944. As it was planned the shipping on the Danube River was restricted and the mines caused heavy losses among the river vessels. From this study, we can get an idea how successful such raids against river shipping were. The Germans faced many troubles; they did not have sufficient amount of the vessels to clean the river of dropped mines and the use of specially equipped minesweeping planes was limited as well. Night fighters were also not successful enough against the Royal Air Force aircraft mining the river. Particularly because not enough fuel was delivered on the land and/or on the water.

[219] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[220] BA/MA, RW40/166, Donau-Sicherungs-Stab des Mil. Befh. Südost/Kampfkdt Eisernes Tor. Kriegstagebuch Nr. 2 vom 1.1.1944 bis 3.8.1944.
[221] ŠAB, f. Československá Dunajplavba, úč. spol., Bratislava (1919-1949), Zápisnica o XXIII. zasadnutí správy Slovenskej Dunajplavby úč. spol. v Bratislave, ktorá sa konala v piatok dňa 15. decembra 1945 o 16.35 hod, v zasadacej miestnosti spoločnosti na Grösslingovej ul. č. 39, Plavebná zpráva od 11. septembra do 14. decembra 1944.

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ŠTÁTNY ARCHÍV BRATISLAVA

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THE NATIONAL ARCHIVES KEW

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ENoRM letter of support for the establishment of a Museum of Water Transport in Bratislava

The European Network of River Museums – ENoRM – Is an open, non-profit group of museums and similar institutions dedicated to the preservation of the technical and cultural heritage along the waterways. The association was founded in 2014 in Gdansk, Poland, where the first and founding meeting of the organisation took place. The members of the association aim to raise public awareness of the importance of this issue and to strengthen the links between individual museums by exchanging information, experience and expertise with each other.

The Slovak Technical Museum, through its branch of the Museum of Transport in Bratislava, documents the various modes of transport in Slovakia, including water transport. In May 2024, this museum, as a member of the association, organised the 9th ENoRM partners meeting in Bratislava. As part of a rich programme, we visited the Winter Harbour with great interest, where we had the opportunity to learn directly about the STM – Museum of Transport in Bratislava to create a Museum of Water Transport. We saw the exceptional potential of historic vessels and specific technological objects (shipbuilding hall, ship elevator, harbour cranes).

The members of the association welcome every effort to provide quality documentation and presentation of the history of water transport, shipbuilding and shipbuilding traditions in the territory of Europe.

The proposed site in the Bratislava harbour – part of the Winter Harbour is unique in its connection of a "living" harbour and the concentration of national cultural monuments connected with the history of water transport. One of the national cultural monuments is a currently disused shipbuilding hall from the 1940s with a preserved bridge crane and machinery in the interior. The building, after reconstruction and conversion into a specialised exhibition – the Museum of Water Transport – has the potential to bring visitors closer to the history of the traditions of shipbuilding and shipbuilding on the territory of Slovakia, in the context of the connection with the countries along the Danube River.

Based on our many years of experience in operating museums in the field of water transport and technology, we support the idea of building a unique Museum of Water Transport using the shipbuilding hall and historic vessels in the Winter Port of Bratislava.

In this context, we would also like to ask the competent institutions, to try to financially and organizationally help the STM – Museum of Transport in Bratislava to create optimal conditions for a quality presentation of the rich history of navigation and shipbuilding, which are so characteristic for Slovakia.

In Bratislava, 15 May 2024

European Network of River Museums (ENoRM)

9th Meeting of partners in Bratislava

13. 5. 2024 – 15. 5. 2024

MEETING PROGRAM

12. 05. 2024 (Sunday)

Arrival of participants to Bratislava

18.00 / 19.00 „get together" in a restaurant (location to be specified)

13. 05. 2024 (Monday)

9.30 – 10.00 Arrival at Transport Museum in Bratislava, registration of participants

10.00 – 10.30 opening of the meeting, welcome speeches *Director of STM – Transport Museum in Bratislava, Representatives of other interested institutions*

10.30 – 13.00 1. part of lectures (contributions from participants)

10.30 – 10.45 **10 years of ENoRM**

10.45 – 11.15 *Wolfgang Stritzinger, Technisches Museum Wien*
The Wiener Neustadt Canal

11.15 – 11.30 Coffee break

11.30 – 12.00 *Markus Reich, Elbschifffahrtsarchiv, Lauenburg*
Raddampfer KAISER WILHELM – Museumsdampfschiff im Originalbetrieb

12.00 – 12.30 *Michael Sohn, Verein zur Förderung der Stiftung Museumshafen, Berlin,*
Publication about Pomeranian Sailing Barges

12.30 – 13.00 *Werner Hinsch, Elbschifffahrtsarchiv, Lauenburg*
Neues aus dem Elbschifffahrtsarchiv

13.00 – 14.00 Lunch (canteen of the Slovak Academy of Sciences)

14.00 – 16.00 guided tour through Transport Museum exhibitions, including the temporary exhibition „100 years of Danube shipping"

17.00 – 19.00 a tour of the Bratislava City Center

19.00 Dinner (location to be specified)

14. 05. 2024 (Tuesday)

9.00 – 13.00 2. part of lectures (contributions from participants)

9.00 – 9.30 *Gordana Karović, Museum of Science & Technology, Belgrade*
From the invisible to the visible: historical shipwrecks

9.30 – 10.00 *Jadwiga Klim, Narodowe Muzeum Morskie w Gdansku*
New projects on the Vistula River and in the National Maritime Museum in Gdańsk

10.00 – 10.30 *Arnulf Siebeneicker, LWL-Museum Schiffshebewerk Henrichenburg*
Current affairs in a history museum. The exhibition "Container. The global box."

10.30 – 11.00 *Lenka Vargová, Comenius University, Faculty of Arts, Department of Archive Studies and Museology, Bratislava*
The use of interactive elements in ship / water transport museums

11.00 – 11.30 Coffee break

11.30 – 11.45 *Ľuboš Kačírek, Slovak Technical Museum - Museum of Transport in Bratislava*
Efforts to establish a Museum of Water Transport in Bratislava

11.45 – 12.15 *Martin Goduš – Michal Jajcaj, Slovak Technical Museum - Museum of Transport in Bratislava*
Preparation of the Water Transport Museum Exposition on the Šturec tugboat

12.15 – 12.45 *Martin Dubiny, Slovak University of Technology, Faculty of Architecture and Design - Jiří Mandl*
Management of the conversion of a national cultural monument in the example of Shipyard hall in the port of Bratislava

12.45 – 13.00 *Dennis Beckmann, Museum der Deutschen Binnenschifffahrt, Duisburg*
Museum shops – questions, ideas, discussion

13.00 – 14.00 Lunch (canteen of the Slovak Academy of Sciences)

14.00 – 18.00 boat trip on the Danube river

19.00 Dinner (location to be specified)

15. 05. 2024 (Wednesday)

9.00	meeting of participants in the Transport Museum, transfer to the Winter Harbour by historical bus
9.00 – 12.00	a tour of the Winter Harbour and historical ships Šturec, Zvolen and Meteor
12.30	transfer by historical bus to the Transport Museum
13.00 – 14.00	Lunch (canteen of the Slovak Academy of Sciences)
14.00 – 16.00	Discussion: Activities of ENoRM
16.00	End of the meeting

List of conference participants:

Name	Country	Institution
Arnulf Siebeneicker	Germany	LWL-Museum Schiffshebewerk Henrichenburg
Beatrix Ordódy	Slovakia	Ministry of Culture of the Slovak Republic
Bojan Radovanovič	Slovakia	MKSR OMGK
Daniel Kamencay	Slovakia	OZ Lodnici
Dennis Beckmann	Germany	Museum der Deutschen Binnenschifffahrt
Erich Píš	Slovakia	(Former) VÚD Žilina
Ernest Huska	Slovakia	OZ Priatelia Bratislavy
Gordana Karović	Serbia	Museum of Science and Technology
Ivan Janitor	Slovakia	Slovak Technical Museum
Jagoda Klim	Poland	National Maritime Museum in Gdańsk
Jan Dolák	Czech Republic	Comenius University, Faculty of Arts, Department of Archive Studies and Museology
Jiří Mandl	Slovakia	Slovak Technical Museum – Museum of Transport in Bratislava (external cooperation)
Juraj Bohunský	Slovakia	(former) SPaP
Juraj Janto	Slovakia	Comenius University, Faculty of Arts, Department of Ethnology and Cultural Anthropology
Laura Ridegová	Slovakia	MK SR
Lenka Vargová	Slovakia	Comenius University, Faculty of Arts, Department of Archive Studies and Museology
Ľuboš Kačírek	Slovakia	Slovak Technical Museum – Museum of Transport in Bratislava
Ladislav Cigánek	Slovakia	(former) SPaP
Markus Reich	Germany	Elbschifffahrts Archiv

Martin Dubiny	Slovakia	Slovak University of Technology, Faculty of Architecture and Design
Martin Goduš	Slovakia	Slovak Technical Museum – Museum of Transport in Bratislava
Michal Jajcaj	Slovakia	Slovak Technical Museum – Museum of Transport in Bratislava
Michal Plavec	Czech Republic	National technical Museum in Prague
Nikola Krstović	Serbia	University of Belgrade
Peter Maráky	Slovakia	SNM – Pamiatky a múzeá
Stanislav Drdoš	Slovakia	Slovak Technical Museum – Museum of Transport in Bratislava
Werner Hinsch	Germany	Elbschifffahrts Archiv
Wolfgang Stritzinger	Austria	Technisches Museum Wien

Renewing Museums. River Museums and their Publics – New Approaches

9th meeting of the European Network of River Museums
Conference proceedings, 13. – 15. May 2024, Bratislava

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