Premonstratensian Grammar School

Kováčska 28, 040 01 Košice

The Overshadowed Genius Béla Gerster

AMAVET Science and Technology Festival

Social Sciences

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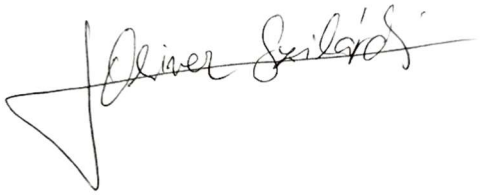
Supervisor: **Mgr. Mária Badaničová**

Consultant: **Assoc. Prof. PhDr. Martin Javor, PhD.**

Declaration of Honour

I hereby declare that I have prepared this paper independently and that all sources used are duly cited and listed in the bibliography. All sources are duly cited in the text and listed in the References section in accordance with the Slovak standard ISO:690:2010STN 01 0197. Apart from submission to the 47th Secondary-School Professional Activity Competition (SOČ), this work has not been submitted to or presented in any other competitions. I am aware of the consequences should any of the above statements prove to be untrue.



Author Oliver Szilárdi

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Abstract

Our project is about the life and works of Košice native Ing. Béla Gerster. His worldwide contribution remains not enough popularized in Slovak historiography and public awareness. The aim of the project was to evaluate his main projects and to find out among the people of Košice what they know about their native. For our methodology, we used a heuristic analysis of primary and secondary literary sources. The theoretical part was supplemented by our quantitative research, made with a structured questionnaire. We did this on a sample of 175 respondents. Its goal was to check the awareness of our native and to confirm the hypothesis about low public awareness. The results we processed were consulted with experts from this field. The results of our project confirm Gerster's big part in projects of worldwide importance, like the geological survey of the Panama Canal route and the realization of the Corinth Canal. The project also shows his less known engineering activity in Austria-Hungary, renovating buildings and planning the construction of railways. The analyzed answers from questionnaires confirmed that more than 72% of respondents do not know Gerster's personality and works, which was the goal of the project. In conclusion, we recommend to support the systematic popularization of Gerster. In our project, we suggested solutions like creating educational materials and organizing lectures. We believe our project will help contribute to the reintegration of this important person into the awareness of people in Košice and Slovakia.

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0 Introduction

Historical research provides essential knowledge about the past. The modern era of digitalization and quick technological progress makes it easy to find basic historical information.

Some historical periods remain neglected by scholars. Unprofessional research and inaccurate findings sometimes distort the true historical facts. This research arose from our analysis of these factors alongside numerous unexplored historical events in Košice.

We strive to research and evaluate the accomplishments and effects of Béla Gerster who originated from Košice but achieved international recognition through his work. Through his position as chief engineer of the Corinth Canal in Greece and his work on the Panama Canal survey expedition, Gerster made essential technical contributions to significant 19th-century canal projects. The paper investigates Gerster's main obstacles alongside his available technological resources and their relationship to modern construction practices.

We analyze the difficulties he faced which included harsh geological obstacles and insufficient funding. We analyze Gerster's personality through his educational background and his determination to succeed globally and his driving ambition for his major projects. Gerster’s work remains important today, especially in the context of global warming. Rising ocean levels threatening coastal areas now require new waterways, canal constructions, and protective hydraulic structures - areas to which Gerster dedicated his professional life.

The primary achievement of this research involves collecting and unifying existing data about Ing. Béla Gerster. The project's secondary achievement involves teaching the public about the studied matters. This professional work demonstrates how past experiences can be used to address present-day challenges. The Košice historian Juraj Halász previously studied this topic by writing multiple publications about it.

1 Research Problem and Literature Review

1.1 Definition of the Research Problem

During the nineteenth century, the Industrial Revolution completely transformed both trade operations and engineering practices. Factories produced goods at unprecedented speeds, yet these goods moved through transportation routes that were both time-consuming and circuitous. The expansion of railways and shipping traffic motivated engineers to develop bold canal solutions, which would create faster and cheaper connections between seas. *(Slovák, ktorý projektoval…, 2014)*. The Corinth Canal embodies the essence of this period. The planners envisioned a direct cut through the thin isthmus instead of forcing ships to take an expensive seven-day journey around the Peloponnese. The channel required several years of planning, including sketching, soil testing, and geological surveys, before its opening brought immediate time **s**avings and operational efficiency. *(Životný príbeh významného…, 2020)*.

1.1.1 Engineering Structures in the 19th century

The introduction of industrialization brought new construction methods, yet executing massive plans remained a challenging task. Canal engineers encountered rock so hard during their excavation that it destroyed their tools while landslides repeatedly destroyed their work and drove both expenses and project deadlines into the stratosphere *(Panamský prieplav, 2019)*. The project experienced significant delays because workers performed most digging operations by hand, while using available explosives for blasting. *(Gerster, 1894)*.

Financial constraints created more sleepless nights than geological challenges. The initial supporters of the Corinth Canal project faced financial difficulties which forced them to stop construction until they secured new investors *(A Korinthoszi-csatorna tervezője…, 2018)*. Major infrastructure projects that receive widespread media attention experience delays when their budgets become insufficient or when unexpected technical issues cause cost increases.

1.1.2 The Role of Canals in Global Transport

Béla Gerster's canal projects — and every other grand waterway for that matter — make it clear that significant infrastructure is never just about engineering; geopolitics plays a huge part too. The Corinth Canal is a perfect example: carving a shortcut between

the Aegean and Ionian Seas slashed sailing time. It freed ships from the weather roulette around the Peloponnese *(Sen starovekých Grékov..., 2021)*.

1.2 Overview of Available Literature and Historical Sources

The first step in studying Béla Gerster's projects requires examination of primary sources, which include archival plans, letters, and technical reports, together with scholarly papers that establish his work within its historical framework. The documents reveal the practical challenges Gerster faced during his work on the Corinth Canal and his Panama Canal route survey. The secondary sources continue the narrative by adding personal information about Gerster and explaining his working approach, and comparing his techniques to contemporary engineering standards.

1.2.1 Primary Sources

Our investigation begins in the archives. The archives contain original plans together with survey notes and progress reports that document the initial canal construction phase. The Corinth bundle contains valuable documents including hand-drawn maps and detailed calculations and straightforward reports about every construction technique the crews implemented. Gerster's book *(A korinthusi földszoros és átmetszése)* stands out as the most significant item because it shows the Isthmus of Corinth and its cutting process. The experience of reading his book provides the same sensation as exploring the site with him. Through his detailed explanation he describes the excavation process and design selection and his solutions for dealing with the challenging terrain. Through this book we achieve the most realistic experience of observing his work as the canal construction progressed.

1.2.2 Secondary Sources

Our second-hand material comes primarily from journal pieces that trace Gerster’s career and break down the engineering behind the Corinth and Panama canals. Today’s researchers like to set their solutions alongside those used on other waterways and ask: Did their fixes stand the test of time, and how would later builders tackle the same problems? As you read, you watch crews battling slipping slopes, hidden fault lines, and budgets that never seemed big enough. These articles also sketch the man himself — his schooling, tireless work ethic, and traits that turned a young Košice native into one of the most respected engineers of his era.

1.3 The Gerster Family

The Gerster family story demonstrates how historical context matters while we should preserve memories of significant individuals from the past. We encounter their names in our everyday routines but these names remain unfamiliar until we first hear them. The story of these personalities reveals how they influenced the world we live in today.

1.3.1 Introduction of the Gerster Family

The Gerster family consisted of craftsmen who originally resided in the Swiss canton of Basel. The family members arrived in Košice through Vienna and Győr. József Gerster, a carpenter, was the first family member to settle in Košice before participating in the Napoleonic Wars. *(Gerster Béla élete..., 2013)*

József Gerster married Terézia Brandtová in January 1805. The couple had three children together: Anna, Zsófia, and József. He remarried in February 1816. His second wife was Magda Vandratseková. The second marriage produced six children including Miklós, Károlyi, Teréz, Ferenc, Antal and György. *(Halász, 2014b)*

1.3.2 Károlyi Gerster and His Work

Károlyi Gerster performed restoration work at St. Elizabeth's Cathedral in Košice, together with his assistant Lajos Frey, who later became a well-known architect. *(Gerster Béla élete..., 2013)* The artistic sculptor from Spiš János Marschalko together with the Košice painter Ferenc Klimkovics and the renowned archaeologist Imre Henszlmann worked with them on these projects. *(Halász, 2014a)* Károlyi Gerster worked with Imrich Henszlmann on castle house excavations in Eger during 1862. The two greats maintained an excellent friendly relationship according to this information. *(Halász, 2014b)*

1.3.3 Béla Gerster's Parents

The fourth child of József Gerster was Miklós-Ignác, a soap maker, who took over his father's house in 1841, thereby obtaining the privilege of domicile, and on August 24, 1841, he married Karolína Schmidtová. *(Gerster Béla élete..., 2013)* After the death of their father, they sold the house so that they could fairly divide the property among all the descendants. In 1845, they managed to acquire a new house, which was large and consisted of two parts. The first, smaller part was part of an administrative building from

a demolished citadel. The second, more modern part, was built by József Gerster on the newly extended part of Hlavná Street. It was in this house that Béla Gerster *(Fig. B1)* was born with eight other siblings. Béla's father Miklós took part in the battle of Budimír on December 11, 1848, as a lieutenant. In the summer of 1849, the persecution of supporters of the Hungarian Revolution began in Košice. Miklós Gerster, along with 22 other citizens of Košice, was taken as a hostage to Krakow. *(Gerster Béla élete..., 2013)* Miklós returned to Košice after two months. Miklós was a member of the city council, a member of the chamber of commerce and industry, and also a member of the Upper Hungarian Museum Association. *(Halász, 2014b)*

1.4 Béla Gerster's Career

Béla Gerster's influence remains unknown to us today but his completed projects continue to exist in the present. The actual projects of his work have established connections between continents while simultaneously strengthening the worldwide economic system. The construction of canals has reduced sea route distances which leads to lower ship fuel expenses and substantial environmental protection.

1.4.1 Béla Gerster's Youth

The birth of He took place on October 20, 1850 in Košice where he finished his primary and secondary education at the Premonstratensian Main Grammar School. During the 1866/67 academic year he was taught by several of the period's foremost scholars, including József Szakkay and Béla Klimkovics *(A Korinthoszi-csatorna tervezője…, 2018)*. He graduated with an engineering degree from Vienna University of Technology in 1873 *(Gerster Béla élete…, 2013)*.

1.4.2 Béla Gerster's Projects

Béla Gerster stands among engineers who surpassed the technical boundaries of his generation. Through his work methods he demonstrated both his endless commitment and his complete mastery of technological systems. The ongoing use of his works in modern times demonstrates his visionary approach which he demonstrated during his lifetime.

1.4.2.1 Francis's Canal

Béla Gerster spent his youth in Pest working for his brother-in-law, István Kauser, an architect and contractor. Kauser was married to Adelina (Adalberta) Gerster, a famous soprano and Béla Gerster's sister. General István Türr ordered Kauser to lead the major development of the Bačka water system through the Franz Canal expansion, which began operation in 1802 *(Halász, 2014b)*.

The programme required the construction of a new waterway to the south, which Gerster supervised as chief engineer of the Franz Joseph Canal. He designed the navigation paths for the Vukovar–Šabac and Upper Kupa canal systems *(Gerster Béla élete…, 2013).*

The Austrian Association of Engineers and Architects in Vienna granted him full membership on July 31, 1878, after confirming his position as principal engineer of the Franz Canal *(Halász, 2014a)*.

Gerster proposed a plan to restore the Franz Canal *(Fig. B2)* by constructing bank-side feeder channels that would have created an agricultural region in northern Bačka similar to Italy's Po Valley *(Gerster Béla, 2016)*.

1.4.2.2 Panama Canal

General István Türr recognized the young, talented engineer and introduced him to his brother-in-law, Lucien Bonaparte Wyse, a French naval officer. Gerster joined an international survey expedition under Wyse's leadership in 1876 *(Slovák, ktorý projektoval…, 2014)*. The team focused on identifying the optimal path for building an inter-oceanic canal through Central America *(Halász, 2014b)*.

The idea of connecting the Atlantic Ocean with the Pacific Ocean dates back over 300 years, when Christopher Columbus visited the region in 1501. During the governorship of Don Andrés de Ariza between 1774 and 1781, the first map of the Darién Isthmus was created, which later confirmed Gerster's fieldwork *(Gerster Béla élete…, 2013)*.

Under harsh working conditions and fierce competition, Gerster expressed his thoughts and frustrations through letters addressed to his brother Árpád *(Halász, 2014a)*.

Árpád, who served as a physician and surgeon in New York, published *New York Surgeon*, which included fond memories of their hometown, Košice *(kosiceonline.sk, 2020)*.

Gerster took charge of one part of the expedition while gathering all scientific information. The investors evaluated 31 distinct proposals for building the Panama Canal. After extensive discussions, they adopted Gerster's proposal to build an open-cut canal that would utilize controlled tributary water flows *(Gerster Béla élete…, 2013)*.

The approved plans proved technically impossible to execute because of corruption scandals and disease outbreaks that affected the workers. Türr followed Gerster's advice to withdraw from the project; he sold his shares to Ferdinand de Lesseps, who made a 3,000-fold profit before the project failed *(A korinthoszi csatorna…, 2013)*.

1.4.2.3 Corinth Canal

The construction of the Corinth Canal remained unsuccessful until the late nineteenth century. A group of Greek patriots attempted to establish a society for canal construction in 1867. The patriots reached out to István Türr, who was in exile at the time, to lead their project *(Halász, 2014a)*.

Türr received official authorization from the Greek king and government through negotiations, which allowed him to start the project. He instructed Béla Gerster to create the final design for the canal *(Fig. B3)*.

During his site survey and preliminary excavations, Gerster observed that the Romans had already carried out remarkably professional work there in antiquity, and he resolved to build on their achievements *(Gerster Béla élete…, 2013)*. During summer fieldwork, four engineers from Pest worked under his supervision: Štefan Kauser, Ladislav Nyári, Garibaldi Pulszky, and Štefan Stéghmüller *(Magyar emlékek nyomában…, 2018)*.

Türr visited the project site in August before delivering a presentation on the project at the International Geographical Society meeting in Venice in September. He successfully convinced potential investors to subscribe 30 million francs at that meeting. The Corinth Canal Company was established shortly afterward, with Türr as its chairman

(Halász, 2014b). Gerster also designed a railway line connecting Athens, Larissa, and Tempe during this period *(A Korinthoszi-csatorna tervezője…, 2018)*.

1.4.2.3.1 Problems Associated with the Construction of the Corinth Canal

Construction of the Corinth Canal began on May 4, 1882, when King George I of Greece performed the ceremonial groundbreaking. Gerster constructed an industrial railway system to meet project requirements by transporting construction materials, food supplies, and medical aid to workers *(Gerster, 1894)*.

The project timeline projected six years for completion, but unexpected challenges caused costs to rise as the deadline approached. The banking consortium that financed both the Corinth and Panama Canals collapsed, which proved to be the fatal blow *(Halász, 2014a)*.

The Panama project showed little progress, but its expenses exceeded the initial estimate of 600 million francs by more than three times, which led to the financial collapse of both ventures. The financial disaster at the Corinth project gave rise to the modern term *"panama-ing,"* which describes any major construction project scandal that causes its collapse *(Gerster Béla élete…, 2013)*.

1.4.2.3.2 Project Construction and Technical Details

The Corinth Canal construction required deep cuttings that followed the English appendix method. The individual shafts evolved into V-shaped trenches through a gradual process. The waterway connecting the Aegean Sea to the Ionian Sea extends 6,343 meters in length and reaches depths of 8.5 meters while maintaining a bottom width of 25 meters *(Korinthoszi-csatorna…, 2022)*. The massive scale of the project indicates that 4,000 workers were present at the site while removing 11 million cubic meters of rock and using 120 tonnes of gunpowder and 450 tonnes of dynamite *(Gerster, 1894)*.

1.4.2.3.3 Completion of Work on the Corinth Canal

Türr became the leader of a Greek company that finished the Corinth Canal after the Hungarian engineers left. The remaining work, under Antonis Matsas's supervision, required ten more years to complete according to Gerster's design *(Halász, 2014a)*. The formal opening of the canal took place on August 6, 1893, when King George I and Queen

Olga of Greece and Emperor Franz Joseph I of Austria-Hungary attended the ceremony *(A Korinthoszi-csatorna…, 2021)*.

1.4.2.3.4 The Corinth Canal in the 20th and 21st Centuries

The Corinth Canal received its finishing touches, but it did not fulfill the expectations set for it. The canal was too narrow for easy transit and the expected traffic volume did not occur *(Korinthoszi-csatorna…, 2022)*. The problem was further complicated by the fact that there was a constant risk that large masses of overburden would shear off the walls *(Gerster, 1894)*.

In 1944, as they retreated, German forces packed the canal with explosives and debris. From 1947, the U.S. Army Corps of Engineers undertook a thorough clearance programme *(Korinthoszi-csatorna: A görögök…, 2023)*. The waterway reopened on 7 July 1948, and ships have sailed through it without interruption ever since *(Fig. B4)*. On 27 May 2009, a memorial to the Hungarian engineers and builders was unveiled on the Loutraki side of the canal *(Fig. B5) (Gerster Béla élete…, 2013)*.

1.5 Béla Gerster's Domestic Work

Béla Gerster *(Fig. B6)* is most often associated with high-profile international ventures such as the Corinth Canal and the route survey for the Panama Canal. Yet his meticulous work also had a decisive impact on the development and expansion of his homeland. Despite the fame and opportunities his global achievements brought him, Gerster chose to channel his expertise into projects that served his native country as well.

1.5.1 Construction of Railway Networks

In Hungary, Béla Gerster collaborated on István Türr's far-reaching water-management schemes. During the country's great railway boom, he designed and built no fewer than thirteen lines. The most notable of these are the Košice–Turňa route (1889) and the Moldava nad Bodvou *(Szepsi)* line (1893) *(Gerster Béla, 2016)*. Thanks to the Košice–Turňa project, an imposing station designed by József Hubert was erected in 1896—sadly demolished in the early 1970s *(Gerster Béla élete…, 2013)*. By way of recognition, Gerster was appointed to the board of directors of the Košice–Turňa Local Railway Company *(Halász, 2014a)*.

1.5.2 Renovation of the Košice County Hall

The assembly of Abaúj-Torna County made a decision on May 24, 1886, to renovate the existing hall instead of constructing a new county building in Košice. The lord-lieutenant (ispán), László Komáromi, declared a closed competition on January 4, 1888 *(Halász, 2014b)*. Béla Gerster submitted the most cost-effective proposal, providing a 19.5 percent reduction from the estimated price, which likely demonstrated his dedication to his hometown *(Gerster Béla élete…, 2013)*.

1.5.3 Architect of Public and Private Dwellings

During the 1880s, there was a significant increase in house construction while new streets were simultaneously developed. The local press monitored architects' work through their coverage of the Ružová Street 6 house in Košice (Rooseveltova 22), which Gerster constructed *(Halász, 2014a)*. The State Building Office questioned his design approach because of thin walls, but Gerster supported his design through mathematical calculations, and the building remains standing *(Gerster Béla élete…, 2013)*.

The three-storey villa that survives today was designed by Béla Gerster together with his cousin Kálmán. Béla managed the construction process while regularly using the house as his residence. The professional journal *Épitö Ipar* (*Building Industry*) published an illustration of the villa in 1909 *(György, 2007)* through an article likely written by Kálmán. Through this piece, we discover that the building included Béla's office and library, multiple entrances and living areas, and a painting studio for his sister Mária *(György, 2007)*.

1.5.4 Domestic Infrastructure Innovations

In 1919, Gerster headed the Building Office responsible for the proposed Danube–Tisza Canal *(A korinthoszi csatorna…, 2013)*. His plans included a Danube–Adriatic waterway to link Budapest directly with the port of Rijeka *(Fiume)*, and a fallback scheme for a similar link between Timișoara and Rijeka. Both projects faltered for lack of interest and capital: the Hungarian government of the day preferred to invest in railways over hydraulic works *(Gerster Béla, 2016)*.

1.6 Commemoration of Béla Gerster

Béla Gerster passed away in Budapest on August 3, 1923. His grave lies in Fiumei *(Kerepesi)* Cemetery, together with those of his father and his daughter, Jolán *(Fig. B7)*. The tombstone was created by Károly Lotz and Alajos Stróbl, and the National Memorial and Commemoration Committee placed it under protection in 2004 *(Gerster Béla élete…, 2013).*

During his time in Corinth, Gerster gathered an important collection of classical pottery, which his heirs later donated to the Museum of Fine Arts in Budapest. The Slovak Technical Museum in Košice organised a commemorative exhibition marking the 160th anniversary of his birth in November 2010 *(Gerster Béla, 2016)*. The Imre Henszlmann Historical Society, under the leadership of Juraj Halász (deceased), mounted an exhibition about his life and work at the Rovas Gallery on Alžbetina Street in Košice *(Životný príbeh významného…, 2020).*

Gerster's birthplace stands at 9 Hlavná Street in Košice *(Fig. B8)*. A memorial plaque *(Fig. B9)* was unveiled there on 21 April 1999; it reads: "Béla Gerster (1850 – 1923), who designed the Corinth Canal project and co-authored the Panama Canal, was born in this house." *(Pamätná tabuľa Bélovi…, 2008)*

2 Objectives of the Thesis

The main goal of this thesis is to conduct extensive research on the life of Béla Gerster of Košice, who carried out advanced water- and transport-construction projects during the transition from the 19th to the 20th century. The study analyses the most important works of Gerster's career, in particular his prospecting of the Panama Canal route and the construction of the Corinth Canal. It also examines his domestic activities and smaller undertakings, including railway construction, public and private buildings, and hydraulic infrastructure on the Danube and Tisza rivers.

Drawing on Gerster's own papers, the thesis develops new perspectives on his international and national achievements and proposes methods for preserving and promoting his legacy. The main objective is thus articulated through several significant sub-goals.

- **Analysis of family and social background**

The research explores the conditions that drove Gerster toward engineering and assesses the effects of social environments in Košice, Vienna, and Pest on his professional development, together with the key figures and institutions that led to his success.

- **Examination of education and early professional practice**

This research traces how Gerster's hometown background and University of Vienna education shaped his professional expertise before leading him to his engineering specialization.

- **Involvement in the Panama Canal project**

This section describes Gerster's specific contributions to Pacific-Atlantic waterway data collection and processing and evaluates his innovative techniques while examining the political and economic obstacles that affected the project.

- **Leadership of the Corinth Canal construction**

This objective requires an exhaustive investigation of the technical methods he used to connect the Aegean and Ionian Seas and a comparative analysis with earlier and later similar projects.

- **Impact on construction within his home region**

The thesis explores Gerster's lesser-known projects, which included railway construction, county hall construction, and other structures to understand their role in transportation modernization and infrastructure development throughout contemporary Hungary, including Košice and its region.

- **Application of findings about Gerster's life**

A further aim is to cooperate with experts in order to process the topic thoroughly. The verification process will help us achieve better precision in addressing the topic so we can develop educational materials for students and the general public.

- **Popularisation and lecture activity**

The project aims to present Gerster's achievements to non-academic audiences by conducting educational programs for students at all educational levels, along with broader community outreach. The research team aims to convince existing secondary-school history textbook writers to include Béla Gerster's story within their science and technology milestones section. The project aims to motivate students through our activities to develop the same engineering skills and analytical abilities Gerster demonstrated during both international and domestic projects. The thesis fulfills its goals by researching Béla Gerster's professional accomplishments while working to restore his reputation as both a Hungarian and Slovak engineer. Béla Gerster should be recognized as a Slovak engineer in addition to being recognized as a Hungarian engineer through our educational activities.

3 Materials and Methodology of the Thesis

The initial direction of the project was suggested by Prof. ThDr. PaedDr. Martin Štrbák, PhD, who recommended a comprehensive study.

Our initial project phase included creating an elaborate action plan which defined both fundamental targets and expected outcomes consisting of source analysis alongside field research and public education lectures for young people and general audiences. Our research team encountered their first challenges when they found that Béla Gerster remained a topic of limited research materials written in Slovak.

During the second phase of our research we conducted an on-site investigation at the State Scientific Library and public library of Košice to review again the historical articles about Corinth Canal construction and Gerster's Panama Canal route work. The available texts existed exclusively in Hungarian language. Our project required expert translation services, which extended the timeline.

We conducted additional research through direct contact with the State Archive and the Archdiocesan Archive and the Košice City Archive. The three archives responded promptly to our emails to provide directions toward Mária Hajduchová and Martin Bartoš's *Košice in the Coordinates of European History* lexicon.

Ing. Alžbeta Očkajaková provided thorough assistance with both Hungarian text translation and article retrieval for our research topic specifically through Hungarian language resources.

To confirm our findings we consulted specialist issues with Assoc. Prof. PhDr. Martin Javor, PhD., who teaches Béla Gerster as an academic subject. Our supervisor Mgr. Mária Badaničová reviewed both our formal questions and the thesis's overall stylistic elements.

The most important resources turned out to be Hungarian scholarly articles about Béla Gerster which delivered fresh historical details and included historical pictures that we used within our thesis.

The next phase required us to organize an extensive collection of notes with excerpts that followed the 2019 research project methodology designed by Ing. Vlasta Púchovská, Eva Bugajová and PaedDr. Anna Sandanúsová, PhD., for secondary-school research

projects under the title *Modern Approaches to Solving Secondary-School Research Projects*. The authors followed the methodology precisely during the writing process to fulfill both the required formal standards and the specified content requirements. We followed the necessary citation guidelines to produce an exact bibliographic record.

We conducted surveys through questionnaires about the public knowledge of Béla Gerster throughout our research period. The questionnaire (Appendix C) targeted secondary school students and older adults to determine their familiarity with Béla Gerster. We wanted to determine if our survey participants could position his engineering accomplishments within the wider historical framework. The collected data underwent processing to create histogram charts.

The research methodology incorporates two elements: extensive historical investigation using primary sources, and presenting complex subject matter to the general public. The approach requires both extensive historical investigation using primary sources and the presentation of complex subject matter to the general audience.

The team plans to deliver educational discussions along with presentations about Béla Gerster's professional and personal life. Our first set of lectures targets students since we want to deliver more than fundamental life details about Gerster. Our main objective is to spark young people's interest in construction subjects which will lead them to pursue university-level studies in these fields. Our team plans to deliver lectures for both specialized and general audiences who are interested in learning about this topic.

The sequence of steps which started with library source collection and proceeded to translation services and expert consultations and ended with public lectures and discussions proved essential for our objective success. The methodology demonstrates in detail the methods of systematic academic research which serve both to evaluate existing knowledge and to present these findings in usable formats for public understanding.

4 Results and Discussion

Our investigation of Béla Gerster required public survey results for interpretation. We deployed Google Forms as an online survey platform to receive 175 participant responses. The survey consisted of questions to determine public knowledge about Béla Gerster and his accomplishments along with opinions regarding better ways to promote him as a historical figure in Slovakia.

4.1 Age and Education of Respondents

The initial section of our survey included questions about participants' age group and educational background, which we present in *Chart A1*. The age range between 41–60 years made up the largest segment of participants who totalled 34.9% of survey participants. The survey showed that university-educated *(Chart A2)* individuals made up 45.7% of participants while the remaining participants completed secondary or elementary education. The majority of participants belonged to middle-aged adults who had achieved higher education.

4.2 Awareness of Béla Gerster

The survey asked participants if they knew who Béla Gerster was *(Chart A3)*. The study findings supported our research purpose since 72.6% of participants admitted they had never heard of him.

4.3 Popularity and Importance of Gerster's Legacy

The survey inquired whether participants believed Béla Gerster receives sufficient recognition as a significant figure in Slovak historical records *(Chart A4)*. Most survey participants lacked knowledge about him, although 54.3% believed he needed more recognition throughout the country. The survey results showed that 49.1% of participants supported the idea that Gerster should receive increased historical recognition in Slovakia *(Chart A6)*. Most participants agreed with the statement that young people need to learn more about Gerster according to *(Chart A8)* since 64.6% of them supported this idea. The participants showed interest in motivating and developing engineering skills among secondary-school and gymnasium students who have yet to decide on their future careers.

4.4 Commemorative Plaque in Košice

The house where Béla Gerster was born at Hlavná 9 in Košice displays an official memorial marker. The results indicate that 79.4% of participants never encountered the plaque *(Chart A7)* which suggests there are problems with its visibility and promotional efforts.

4.5 Ways to Raise Awareness

The survey presented multiple choices to enhance Béla Gerster's public recognition through documentary film production as the top preference *(Chart A5)*. A documentary film production received the most support from survey participants at 62.9%. Most participants selected this option as their preferred method for this topic.

4.6 Summary of Survey Results

The survey results demonstrate that Béla Gerster remains unknown to the majority of the general population. The survey data demonstrates that people want to learn more about him. The survey findings show that Gerster's name is not linked to either the Panama or Corinth Canals by most people. The better placement and promotion of his commemorative plaque in Košice along with outreach programs will lead to significant improvement.

The questionnaire analysis shows the following conclusions:

- Béla Gerster’s name is insufficiently presented.

- The majority of respondents choose to learn about his life through films and online platforms along with interactive experiences.

- The awareness of his birth house in Košice remains low even though his plaque exists there.

4.7 Discussion

The available information about Béla Gerster shows that his technical-engineering achievements led to international success, but he remains unknown as a significant Slovak figure. The publications briefly note that Béla Gerster who was born in Košice designed the Corinth Canal. The public view of Gerster remains incomplete because his work included railway projects in the area where he lived. The public loses interest in stories when facts are presented with imprecision because the narrative no longer connects to their experiences. The multilingual environment of Košice during that time period has led some members of today's population to view Gerster as a Hungarian canal builder instead of a Slovak engineer.

The international recognition of Gerster's work on the Corinth Canal and Panama Canal route surveying has not prevented people in Košice from forgetting his authorship of these projects. The commemorative plaque dedicated to Gerster on Hlavná Street in the city center remains unknown to most residents of Košice. The plaque serves as a rare educational opportunity to introduce the world-famous engineer to younger generations. Gerster maintained his love for his birthplace while frequently returning to Košice.

Our future popular-science lectures and school panel discussions will serve as essential tools to increase public knowledge about this subject. Our mission is to distribute acquired knowledge about these figures through educational programs and publications to ensure Béla Gerster's name remains in public memory for future generations.

5 Conclusion

Our project focused on revealing the accomplishments and life history of engineer Béla Gerster, who originated from Košice, before other prominent figures from the area gained recognition. Our first target was to outline both his professional career and his key achievements especially his work on the Corinth Canal. Our secondary target consisted of understanding public recognition of this engineer and creating specific recommendations for his enhanced visibility in society.

Béla Gerster received his highest international recognition through his work on the Corinth Canal as well as his other international ventures. His work on the Košice–Turňa railway together with administrative building reconstruction in Košice demonstrates his local impact on the region. This research contributes to the exposure of his domestic work despite previous publications which neglected these activities. The survey results show that residents of Košice remain unaware of his name despite two prominent landmarks dedicated to him on Hlavná Street.

The available documentation provides us with an extensive understanding of Béla Gerster's professional growth as well as his personal life. The project expenses increased because of insufficient funding and construction challenges and unexpected landslides and Hungarian political issues from that time period. Our analysis of sources aims to prevent wrong interpretations while demonstrating Gerster's direct involvement in each project.

This work serves an educational purpose by expanding historical educational materials. The research reveals engineering projects of the era together with their designers while providing detailed insights about the historical context. Béla Gerster provides an additional historical perspective for understanding events that occurred during the transition between 19th and 20th centuries. The findings present opportunities for regions and cities to build stronger tourism by promoting local figures who brought international recognition to their hometowns. The solution to this problem involves investing money to create improved visitor educational materials that lead guided tours which explain both Gerster's accomplishments and his biography.

We strongly support increased promotion efforts for the historical heritage of unsung figures who worked behind the scenes. The first of two potential solutions involves educational programs for students through history or geography classes, which demonstrate regional importance using Béla Gerster as an example. According to Assoc. Prof. Martin Javor, PhD., teaches Gerster to students at the university level in historical-technical classes. We want to expand this topic beyond academic circles to reach grammar schools and primary schools. The second solution involves conducting popular-science discussions about his work for both students and the general public.

A rising public awareness of Gerster's work could transform Košice into an engineering city while motivating residents to participate. The unification of all Béla Gerster-related materials into a single comprehensive text represents the main advantage of our project.

We consider the complete achievement of our objectives as our final assessment. His technical solutions and personal approaches demonstrate analytical thinking that can benefit both engineering projects and everyday life situations.

The successful execution of our proposed awareness-raising and popularization strategies depends on multiple institution-wide cooperation. Our plans to revive Gerster's achievements through public discussions and lectures will likely receive positive feedback from students as well as from experts and ordinary people.

We strongly believe that we must adopt this approach to protect and develop the cultural and historical heritage left by Béla Gerster and other notable figures whom we should feel proud of.

Summary

Béla Gerster was an engineer from Košice, whose works have significantly influenced international infrastructure. This study deals with his most important projects, primarily the routing of the Panama Canal and the realization of the Corinth Canal constructions. It also describes his personal life and his involvement in Austria-Hungary as well as examining the challenges Gerster encountered during the realization of his projects, such as unsuitable geological conditions or a lack of financial capital. A separate section is also devoted to his work on railway lines and urban projects in Košice and its surroundings. This work also includes a survey, the findings of which reveal that Gerster and his are relatively unknown among the general public. One possible solution to this would be to organise a series of lectures and discussion intended to educate the public on Gerster and his contributions to architecture. The results of this work can serve as a reference for further research into the history of technology and regional history.

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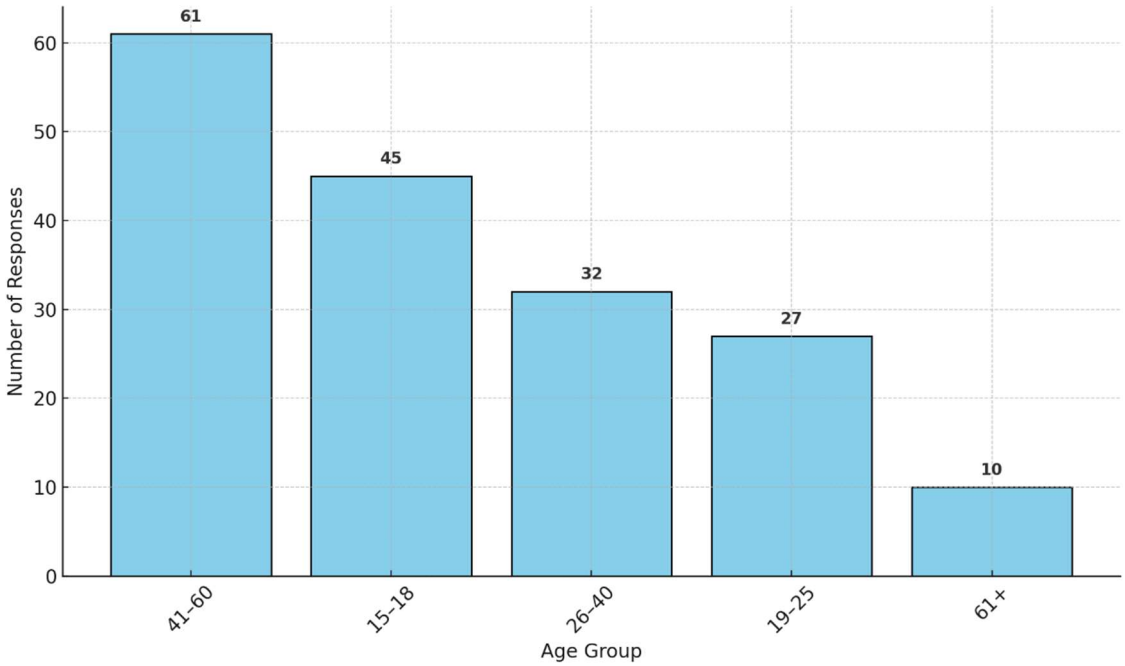
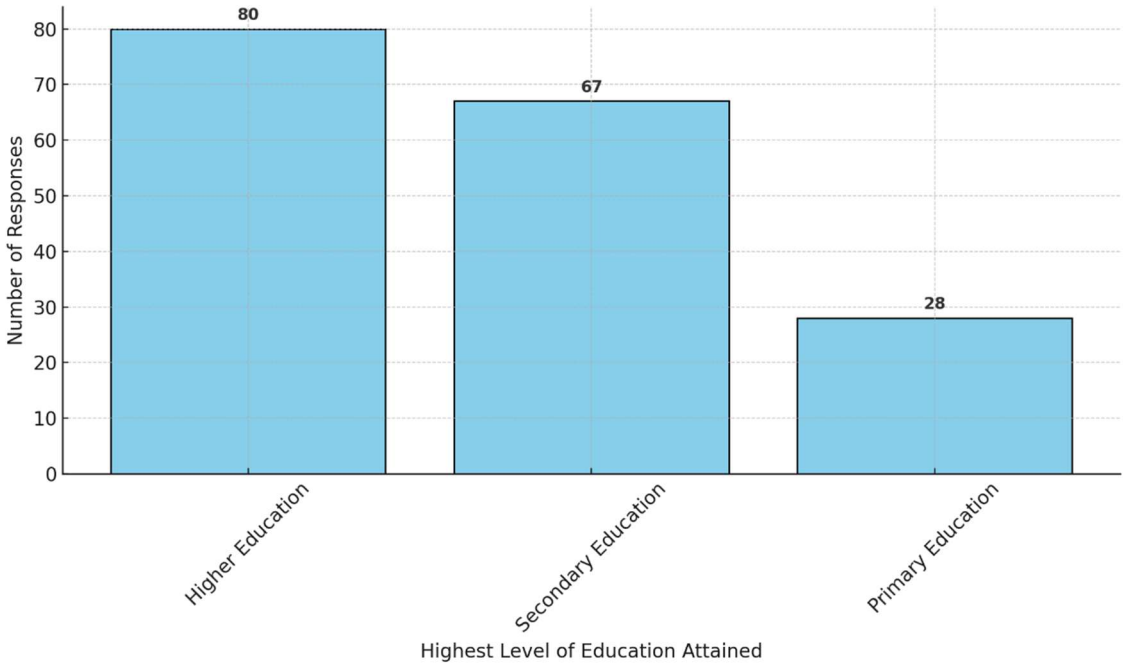
List of Appendices

Appendix A – Survey Graphs



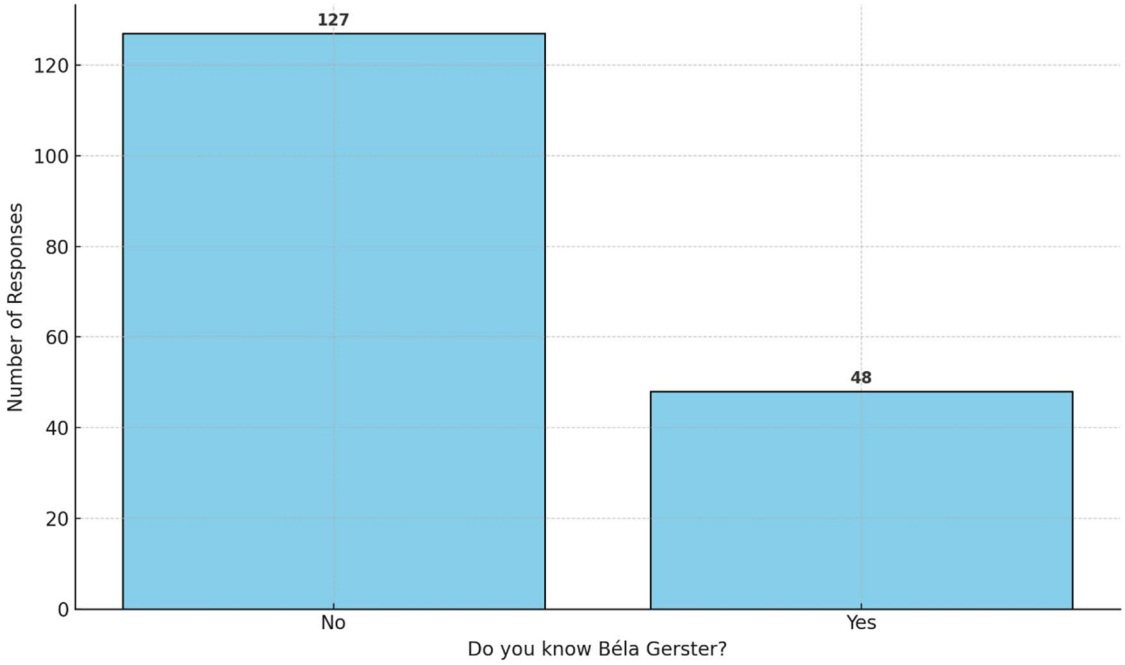
Graph A1 Research Sample by Age Group

(source: author's own elaboration)



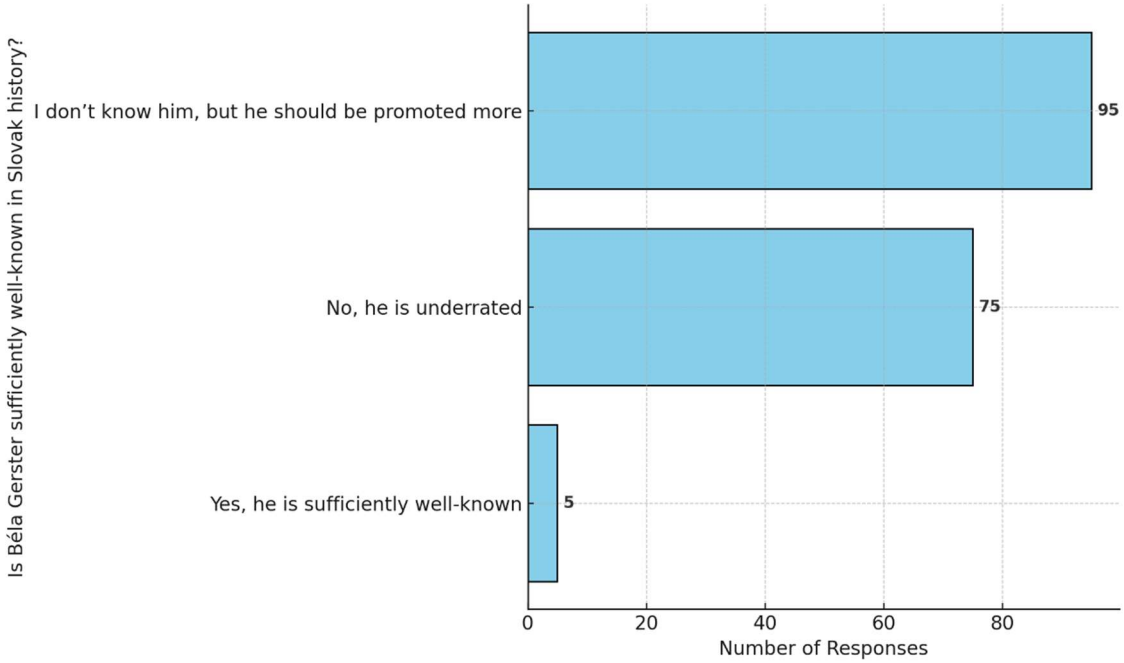
Graph A2 Highest Level of Education Attained by Respondents

(source: author's own elaboration)



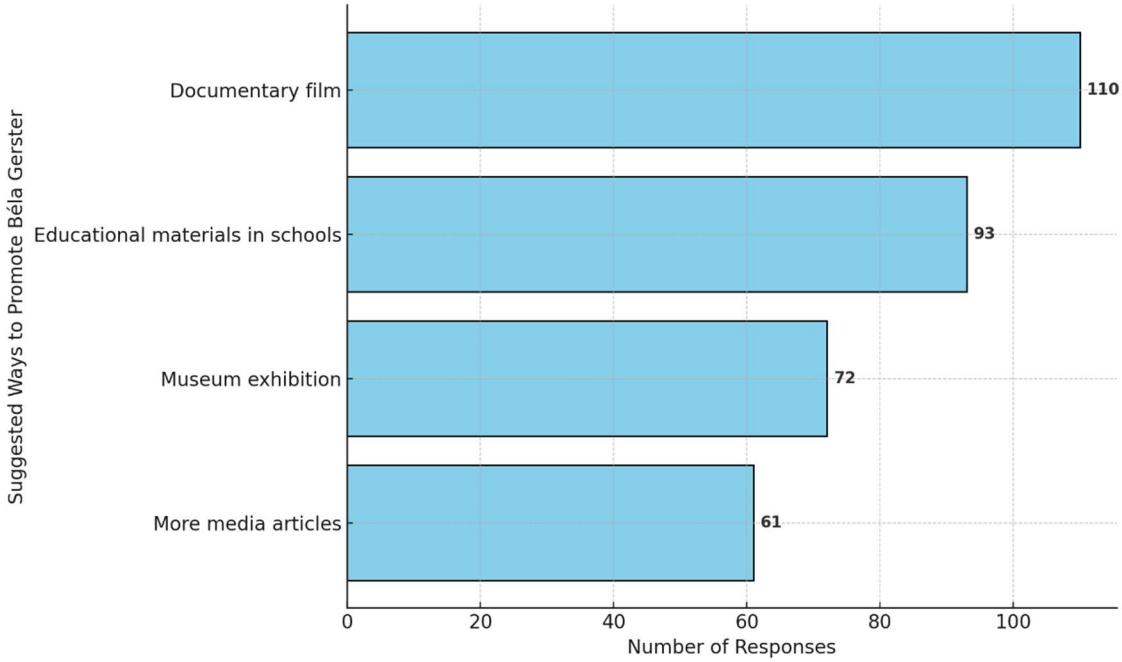
Graph A3 Awareness of Béla Gerster

(source: author's own elaboration)



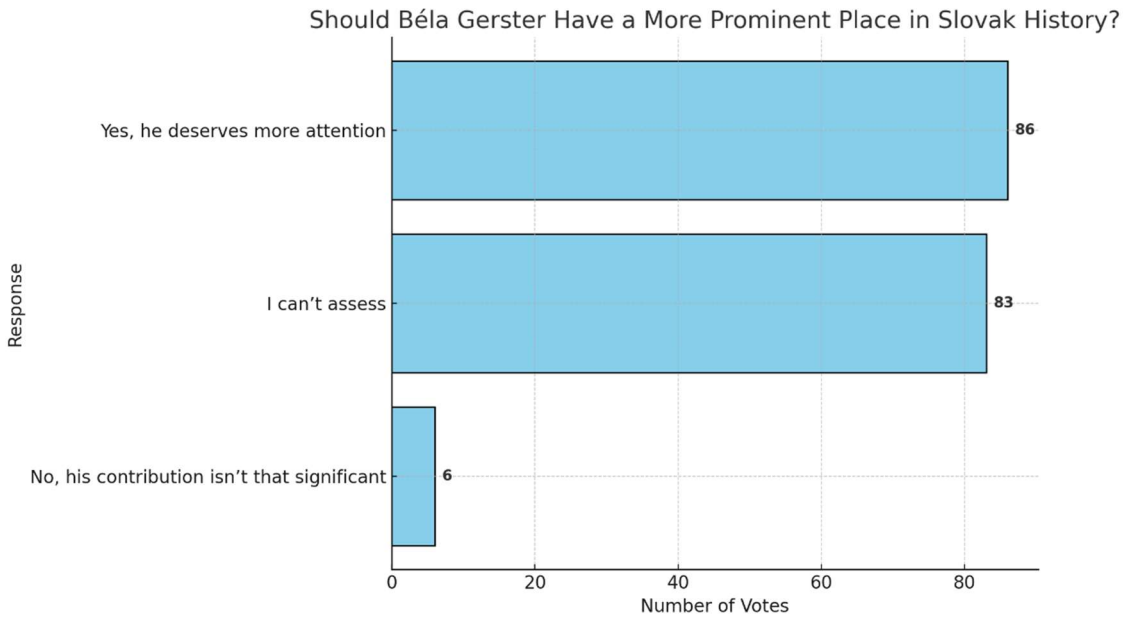
Graph A4 Béla Gerster’s Popularity in Slovak History

(source: author’s own elaboration)



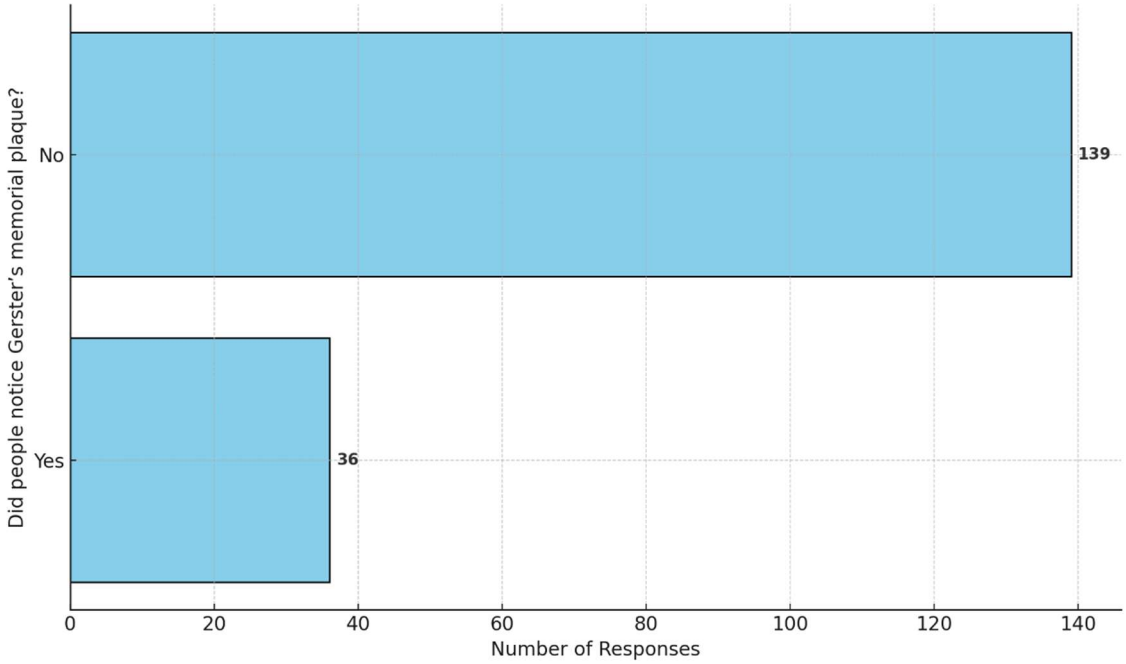
Graph A5 Proposed Methods for Promoting Béla Gerster

(source: author's own elaboration)



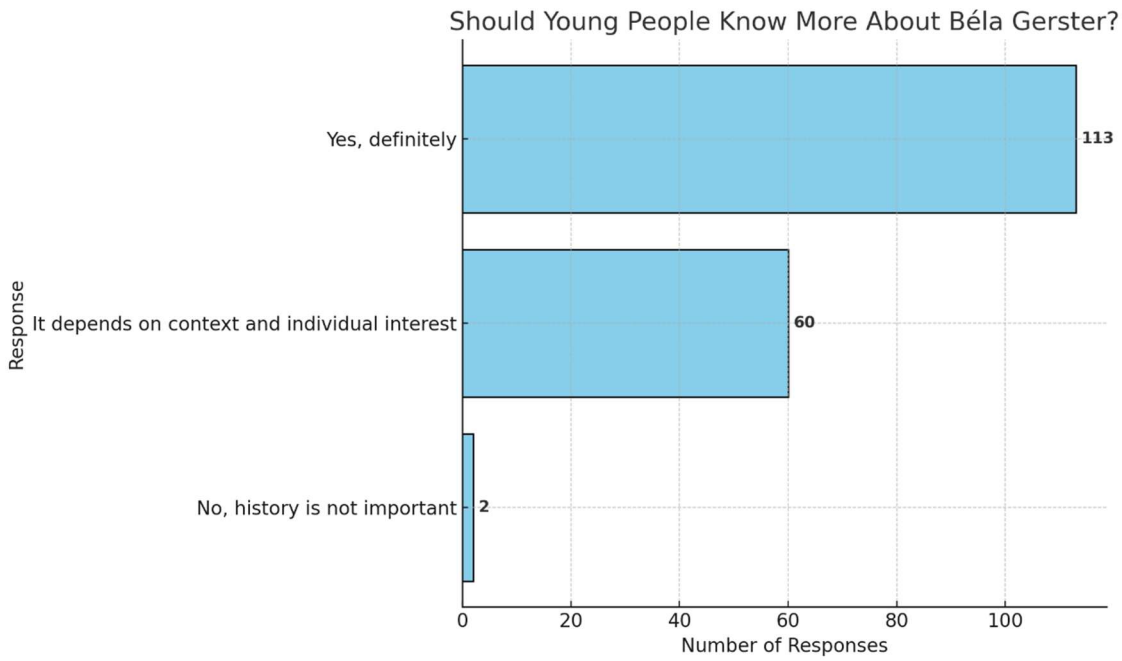
Graph A6 Respondents' Views on Béla Gerster's Importance in Slovak History

(source: author's own elaboration)



Graph A7 Perception of Béla Gerster's Commemorative Plaque

(source: author's own elaboration)



Graph A8 Knowledge of Béla Gerster among Young People

(source: author's own elaboration)

Appendix A – Photographic Documentation and Visual Materials

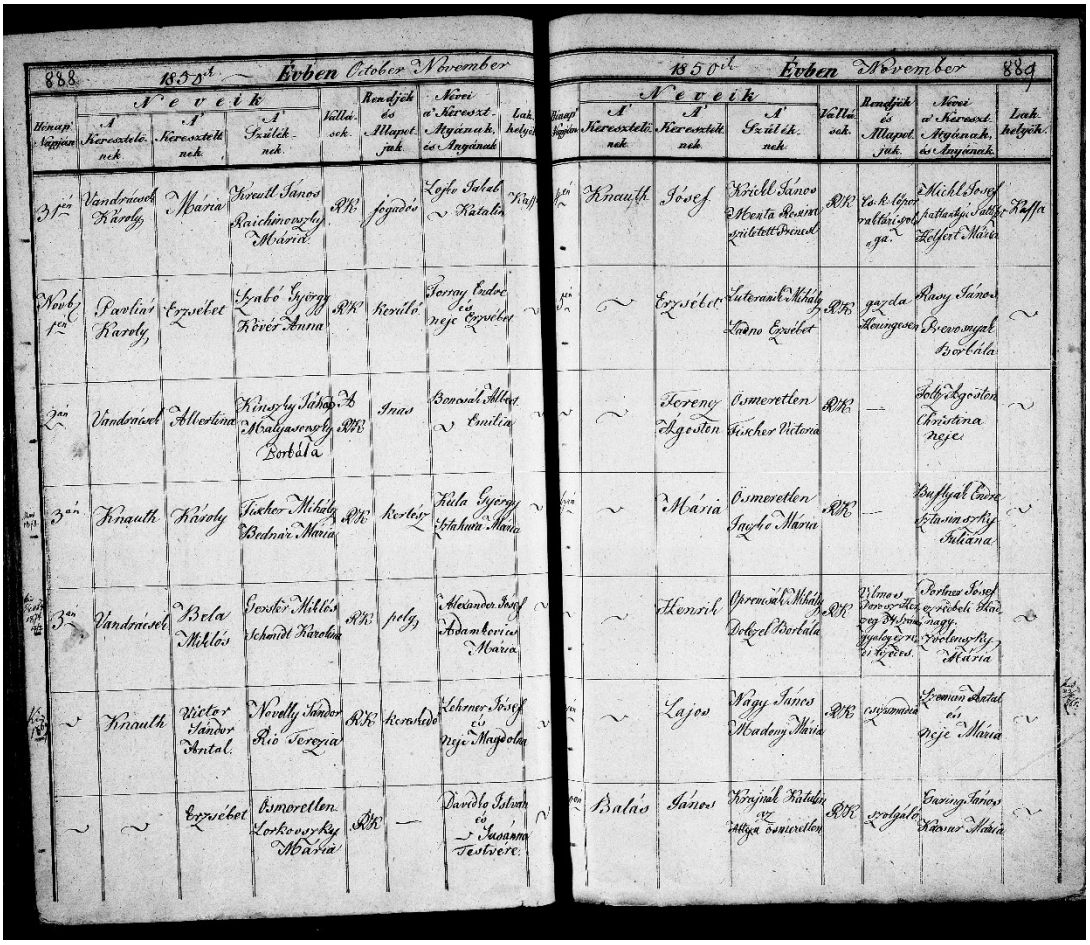


Figure B1 Béla Gerster's Baptismal Record in the Parish Register

(source: https://www.familysearch.org/ark:/61903/3:1:33S7-9RQ1-17J?cc=1554443&wc=9P3P-VZQ%3A107654301%2C109211501%2C109432901%2C135170501&lang=sk&i=395)

Figure B2 Historical View of the František Canal

(source: http://www.klauzal.hu/cikk/656.html?PHPSESSID=4b3d2324332a96af2b519441380d1a44)

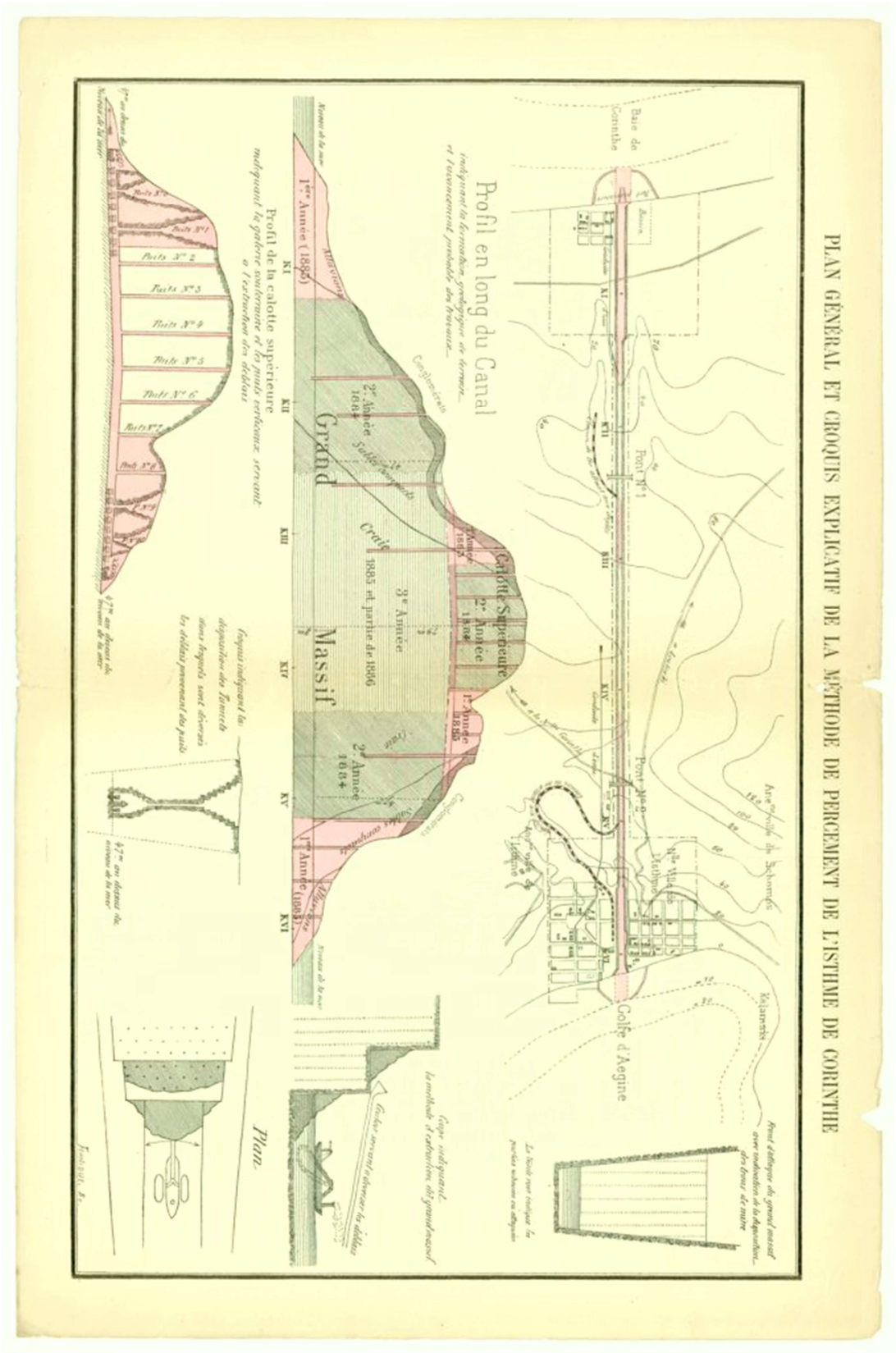


Figure B3 Implementation Plan for the Construction of the Corinth Canal

(source: https://histoire.bnpparibas/wp-content/upload/2021/07/PlanPercementCanaldeCorinthe-1024x676.jpg)

Figure B4 Present-Day View of the Corinth Canal

(source: https://histoire.bnpparibas/wp-content/upload/2021/07/PlanPercementCanaldeCorinthe-1024x676.jpg)

Figure B5 Monument to the Engineers of the Corinth Canal

(source: https://s3-eu-central-1.amazonaws.com/wp-csemadok/wp-content/uploads/sites/32/2016/03/22115018/gerster-bela-korinthoszi-emlektabla.jpg)

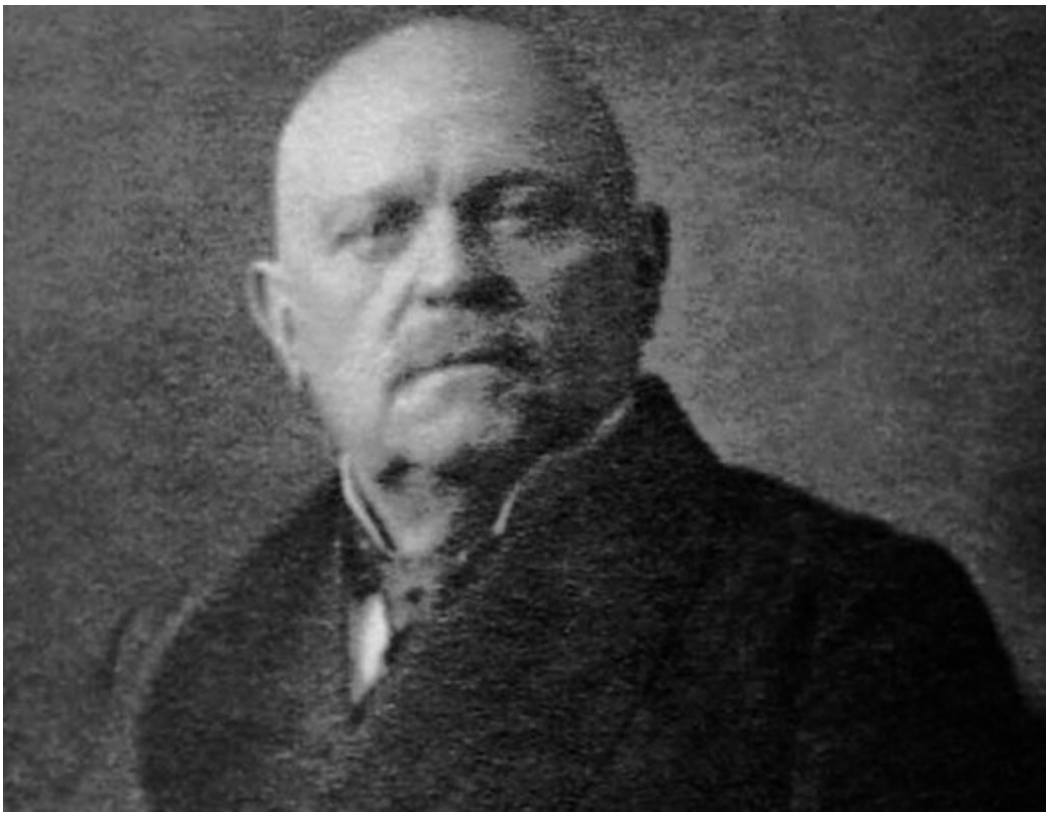


Figure B6 Photograph of Béla Gerster

(source: https://m.smedata.sk/api-media/media/image/sme/4/25/253884/253884_1200x.jpg?rev=1)

Figure B7 Grave of Béla Gerster

(at the grave: Juraj Halász and his wife, together with Consul General Éva Czimbalmosné Molnár and Tímea Havasi)

(source: http://www.klauzal.hu/cikk/656.html?PHPSESSID=4b3d2324332a96af2b519441380d1a44)

Figure B8 Gerster's House Today

(source: author's own elaboration)

Figure B9 Commemorative Plaque Honouring Béla Gerster on His Birth House

(source: author's own elaboration)

Appendix C – Sample Questionnaire

The Overshadowed Genius Béla Gerster – SOČ 2025 Questionnaire

My name is **Oliver Szilárdi** and I am a student at the Premonstratensian Grammar School in Košice. As part of the 47th annual *SOČ* (Secondary-School Professional Activity) competition I have chosen to explore the forgotten genius **Béla Gerster**, born in Košice, whose projects reached far beyond Slovakia and influenced the wider world.

This survey is aimed at the general public, specialists in history, engineering and architecture, as well as students and teachers. Please take a few minutes to complete this anonymous questionnaire.

Thank you for your time and your answers!

Tick one or more options, or supply your own answer where indicated. (A question marked with an asterisk * is compulsory and will receive special analysis in the final report **The Overshadowed Genius Béla Gerster**.)

General Information about the Respondent

1. **What is your age?***
   a) 0 – 15 b) 15 – 18 c) 19 – 25 d) 26 – 40 e) 41 – 60 f) 61+

2. **What is your highest level of education?***
   a) primary b) secondary c) tertiary

3. **Do you know Béla Gerster? Have you ever heard of him?***
   a) yes b) no

Respondents' Knowledge of Béla Gerster

4. **Which professional fields did Béla Gerster work in?** (tick all that apply)
   a) construction & engineering b) geology c) astronomy d) architecture e) other: _____

5. **Which major projects was Béla Gerster involved in?** (tick all that apply)
   a) František Canal b) Corinth Canal c) Panama Canal d) Eiffel Tower e) other: _____

6. **Did you know that Béla Gerster designed the route of the Corinth Canal and co-designed the route of the Panama Canal?***
   a) yes b) no

7. **Why, in your opinion, was Gerster's route for the Panama Canal not ultimately carried out?**
   a) political reasons b) technical issues c) financial reasons d) other: _____

8. **Which of Gerster's projects do you regard as the most significant?**
   a) Panama Canal b) Corinth Canal c) railway construction in the Kingdom of Hungary d) other: _____

Béla Gerster's Legacy

9. **Do you believe Béla Gerster is sufficiently well-known in Slovak history?***
   a) Yes, he is well known. b) No, he is underrated. c) I don't know him, but he should be promoted more.

10. **If you were to suggest ways to improve awareness of Béla Gerster, what would you propose?*** (tick all that apply)

    a) more media articles b) a museum exhibition c) a documentary film

    d) educational materials in schools e) other: _____

11. **Should Béla Gerster occupy a more prominent place in Slovakia's history?***

    a) Yes, he deserves greater attention. b) No, his contribution is not that important. c) I can't judge.

12. **Have you noticed the commemorative plaque to Béla Gerster on Hlavná Street in Košice?***

    a) yes b) no

Personal View of the Respondents on Béla Gerster

13. **Which of the following qualities best characterises Béla Gerster, in your view?**

    a) visionary b) engineering genius c) skilled designer d) determined investor

14. **Do you think young people should learn more about historical figures such as Béla Gerster?***

    a) Yes, definitely. b) No, history is not important. c) It depends on context and personal interest.

15. **How would you rate Béla Gerster's contribution to Europe's technical and economic development?**
    a) Significant – his projects shaped Europe's infrastructure.
    b) Moderate – important in his time, but not beyond.
    c) Insignificant – little impact on technological progress.
    d) I can't judge.

16. **If Béla Gerster were born today, which projects do you think he would work on?**
    a) modern waterways and canals
    b) innovation in rail transport and infrastructure
    c) environmental projects and urban planning
    d) technological advances in geodesy and engineering

17. **Do you think today's engineers could take inspiration from Gerster's approach to large-scale projects?**
    a) Yes – his meticulous planning and technical precision remain exemplary.
    b) Partly – some methods are dated, but his innovative spirit is inspiring.
    c) No – modern technology is on a different level and his methods are obsolete.

Thank you for your time and willingness to complete this questionnaire. I wish you all the best and will keep you informed of my project's progress.

— **Oliver Szilárdi** (author of *The Overshadowed Genius Béla Gerster*)