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Hungarian Military Defence Systems in the Northeastern Carpathians

Author's Summary of the Doctoral (PhD) Dissertation

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Relevance and Justification of the Research Topic

Around the turn of the millennium, I regularly guided groups through Transcarpathia. During one such trip, we stayed in a nicely constructed tourist lodge in Ökörmező (today: Mizhhiria). The operator of the lodge, Igor, told us that the log cabin standing by the gate had served as the duty station of the Hungarian border guard unit, stationed there from 1939 onwards. This information immediately caught my attention because, according to family history, my maternal grandfather had served there as a soldier.

Later, on the bank of the Nagy-Ág River, Igor showed me an information board he had prepared beside a damaged reinforced-concrete structure. He asked me to read the text and provide my opinion. The title was: *"Bunker of the Árpád Line"*. The first part contained a correct description of Grand Prince Árpád. The second section discussed the Árpád Line. As a tourism professional and tour guide, I had to admit that I could not evaluate the text, as I had never learned anything about the Árpád Line, nor had I encountered it in the tourism literature available at the time.

After returning home, I contacted my friend Ferenc Rusz, Lieutenant Colonel of the Border Guard, concerning the Árpád Line. *"During my military studies I have never heard a single word about this fortification system. I searched my memory in vain. At the military college and later at the Miklós Zrínyi Military Academy (1984–1988), to my knowledge not a single lecture on fortifications was delivered within military history courses. My former classmates knew nothing about it either..."*[1]

At that point we have decided to explore and survey the entire Árpád Line system. Beyond the excitement of discovery, I was also motivated by the fact that my ancestors had fought in this region.

Research in Transcarpathia began in 2004. At that time only limited literature was available, mainly A. A. Grechko's *Through the Carpathians* and the military historical work on the Árpád Line published by József János Szabó in 2002. These sources made it clear that the reinforced-concrete defence system had been constructed to block those valleys of the Carpathians that were passable by military vehicles.

As a result of field research, by 2019 we had identified more than 300 reinforced-concrete structures, transportation trenches, open firing positions, remains of earth-and-timber bunkers,

[1] Rakaczky–Rusz (2009) p. 7.

and anti-tank obstacle systems. I walked through the approximately 360-kilometre-long Carpathian ridge from the Romanian border to the Polish border and further to Mount Czerenin, following the principal watershed and documenting the remains of the Saint Ladislaus Line (*Szent László-állás*).

Field investigations began at the very last moment. We were still able to meet and interview individuals who, as older children or young adults, possessed personal memories of the events of 1944 and the Hungarian defensive lines. The five years I have spent studying at university in the Soviet Union proved particularly useful, as they provided firsthand experience of local society and mentality.

An additional motivation was the fact that the military history of the Northeastern Carpathians had not yet been comprehensively researched. Thus, our work filled up a significant gap. The mostly forgotten Hungarian principles of mountain fortification and their divergence from the dominant interwar European fortification concepts increasingly became the focus of my attention.

Completing doctoral studies and writing this dissertation represented an intellectual challenge. I am pleased to have undertaken this work and to have contributed to uncovering and reintroducing a neglected chapter of Hungarian military history into professional and public awareness.

Formulation of the Scientific Problem

Following the military experiences gained during the First World War in the Carpathians and the collapse of defence systems constructed according to the Maginot principle, the defence of Hungary's northeastern and eastern mountain frontiers required a fundamentally new military approach.

The Hungarian military documentation related to the triple defence system constructed in the Northeastern Carpathians and their foreland was either destroyed or disappeared. After 1945 the area became part of the Soviet Union, making research virtually impossible.

The detailed exploration and publication of the defence system and reinforced-concrete structures established in the Transylvanian section of the Eastern Carpathians were carried out under the leadership of military historian József János Szabó[2] during the early 2000s.

However, the military-historical investigation of the Árpád Line within the approximately 300 kilometre long arc of the Northeastern Carpathians remained only partially completed. A significant portion of the triple defence system was constructed within this section of the mountain range, while the Hunyadi Line (*Hunyadi-állás*) and the Saint Ladislaus Line (*Szent László-állás*) had never previously been the subject of comprehensive research.

Key research questions include:

- Where was the national defence system established?
- What was the scale of the development?
- What strategic principles determined its layout?
- What technical solutions were used?

The public release of a large amount of Soviet archival material through the *Pamyat Naroda* database, together with captured German documents published online, has significantly expanded the range of available sources.

During the war, Soviet commanders did not fully understand the operational principles of the Hungarian defence system. Consequently, after the front had passed, Soviet military engineers were tasked with surveying the Árpád Line and preparing technical drawings of its structures. As reported in the 1945 issues of the *Military Engineering Journal* (*Voenno-Inzhenernyi*

[2] Szabó (2002)

Zhurnal), the resulting documentation is currently preserved in the Central Archive of the Ministry of Defence of the Russian Federation (TsAMO RF), where it is still classified.

Despite repeated official requests submitted in 2021 and 2025, I was not granted access to these records. Nevertheless, valuable information could be obtained from published Soviet operational reports and Russian doctoral dissertations containing archival data relating to the Árpád Line.

Another main question concerns the role of the triple defence system during the 1944 Carpathian Operation. To what extent did it slow or halt the advance of the Red Army?

Prior to the operation, Soviet forces took lessons from previous combat experiences in the Carpathian foreland. Units suffering heavy losses were replenished and equipped with the latest Soviet military technology. In the Northeastern Carpathians, the principal attacking force was the 4th Ukrainian Front. Against the Hungarian First Army and, on its western flank, formations of the German First Panzer Army, Soviet forces deployed the 1st Guards Army, the 18th Army and the 17th Guards Rifle Corps.

The operational doctrines developed by the Soviet Union during the 1930s proved difficult to apply in the Carpathian environment. The field fortifications in the foreland, followed by the valley blocking positions of the Árpád Line, significantly disrupted Soviet momentum and inflicted considerable casualties on the attackers. The Árpád Line only fell into Soviet hands after the withdrawal of the Hungarian First Army.

A further research problem concerns the post-war fate of the reinforced-concrete structures of the Árpád Line.

Retreating Hungarian forces demolished some of the fortifications and removed or destroyed stored supplies. Soviet military engineering units subsequently destroyed additional structures. Many fortifications were later used by the Ukrainian Insurgent Army (UPA) during its struggle against NKVD forces. According to local accounts, NKVD units continued demolishing certain fortified structures as late as 1953. The extensive fortification complex at Felsőgereben remained in use by the Red Army until the 1960s.

Today, several sections of the former defensive system, including the Utcás Valley, Ung Valley and Talabor Valley, are incorporated into ecotourism programmes. Some well-preserved structures on private property are used as storage facilities, while others have been adapted for tourism purposes.

Research Objectives

The primary objective of this research is to identify, survey and document the triple defensive system of the Northeastern Carpathians, to examine its operation from a military-strategic perspective, and to present its role in the autumn campaign of 1944.

A further objective is to explore and present the current condition, utilisation and potential future uses of the Árpád Line.

In addition, the dissertation seeks to contribute to existing knowledge by integrating the approximately 600-kilometre-long Árpád Line into a unified military-geographical and operational framework, building upon the earlier Transylvanian research conducted by József János Szabó.

My specific research objectives are as follows:

1. To identify the internal and external political and military factors that fundamentally shaped the doctrine and construction of the Hungarian defensive system in the Carpathians.

2. To determine the nature, scale and structure of the defence system established by Hungary between 1939 and 1944 in the Northeastern Carpathians and their foreland, including the location of defensive elements and their tactical interconnections.

3. To analyse the principles and practical implementation of military defence during combat operations, examining both Hungarian defensive actions and Soviet offensive operations during the Carpathian Operation, while also considering the consequences of Romania's change of sides and the political events of 15 October 1944.

4. To investigate the post-war history of the Árpád Line, including its role in the UPA–NKVD conflict, its current condition, its research potential, and its twenty-first-century utilisation.

Research Hypotheses

Based on a review of Hungarian and international scholarly literature, several issues and methodological approaches can be identified that have received limited attention from researchers or have only been examined indirectly.

In accordance with the research objectives, the dissertation examines the following hypotheses: Throughout history, defensive structures such as ditches, walls, castles and fortification systems have evolved alongside developments in military tactics and firepower. Following the World

War I, new fortification principles emerged across Europe. Reinforced concrete defence systems based on the Maginot concept required enormous financial resources.

Hungary began constructing its Carpathian defensive system in 1939.

H1

Hungarian fortification approach between the world wars was based on independent principles distinct from the static fortification systems of Western Europe. It aimed to establish an active, terrain-adapted and defence-in-depth system.

H2

The Hunyadi Line, the Saint Ladislaus Line and the Árpád Line did not constitute separate defensive objects but formed an integrated defence-in-depth system built upon the military-geographical characteristics of the Carpathians.

H3

During the autumn of 1944, the defensive system inclding the Hunyadi Line, the Saint Ladislaus Line and the Árpád Line was capable of slowing Soviet offensive operations and tying down attacking forces. However, changing strategic conditions on the Eastern Front, Romania's defection, and decisions taken by Hungarian political and military leadership fundamentally influenced the system's continued viability and ultimate fate.

H4

The surviving structures of the Saint Ladislaus Line and the Árpád Line, together with the available historical sources, make it possible to partially reconstruct the structure and operation of the Hungarian Carpathian defensive system. Following the Second World War, these fortifications did not completely lose their military significance. Their post-war history continues to offer valuable lessons for military history, military geography, heritage preservation and territorial defence studies.

RESEARCH STRATEGIES AND METHODS

Due to the nature of the topic, the research follows the principles of **applied research**, aiming to generate new knowledge with practical relevance. Owing to the complexity of the research field, both **deductive** and **inductive research strategies** are employed.

Among the available research methods, the study primarily relies on **exploratory research**.

1. Archival Research and Document Analysis

During the existence of the Soviet Union, the records of the World War Two preserved in Soviet archives were classified, making them inaccessible to civilian and foreign researchers. Over the past one to two decades, an increasing number of documents and operational reports have become available for research. This applies both to Soviet records and to captured German materials.

The analysis of these sources provides opportunities for obtaining new information. Unfortunately, direct research access to the Russian archival documentation concerning the valley blocking positions and structures of the Árpád Line remains impossible. In particular, the engineering drawings are preserved within the holdings of the Central Archive of the Ministry of Defence of the Russian Federation (TsAMO RF), where access continues to be restricted.

2. Field Observation and Terrain Survey

The second major research method is direct observation. This includes on-site surveys of the defensive systems, identification of surviving reinforced-concrete fortifications, earth-and-timber structures, and other remnants, as well as the preparation of topographical documentation.

Field investigations covered both the Árpád Line and the Saint Ladislaus Line and their surviving structures.

As a result of research conducted since 2005, I have surveyed every valley between the Ciróka Valley and the Tisza Valley within the Carpathian sector under examination. This work resulted in the identification of hundreds of reinforced-concrete structures, earth-and-timber bunkers, many kilometres of communication trenches, and remnants of engineering obstacles.

Following the initial exploratory phase and the identification of several defensive sectors, the principal military-geographical factors determining the placement of defensive systems were

reconstructed. Based on these findings, numerous previously undocumented sites were identified, including the Utcás Valley blocking position, the Viharos Valley defensive sector, and the defensive system along the Brusztura Valley.

Considerable assistance was provided by local inhabitants, whose detailed knowledge of their surroundings greatly contributed to the identification of structures. My knowledge of Russian and local conditions facilitated communication and enabled the collection of valuable information. It was still possible to interview individuals who remembered the presence of Hungarian troops and the events of 1944.

Many reinforced-concrete structures were personally shown to us in remote locations or on private property. The research was further supported by my experience as a mountain guide and by several decades of mountaineering activity.

In the foreland of the Carpathians, traces of the Hunyadi Line were also investigated. Surveys were conducted, among other locations, in the area of Tatariv, where hundreds of metres of communication trenches, open firing positions, and the graves of Hungarian soldiers killed during the fighting of 1944 were identified. Research was also undertaken at the sites of the battles around Deliatyn and Yaremche, where eyewitness accounts were collected.

In several stages, the former border of the Kingdom of Hungary along the Carpathian watershed was traversed. This area contains the remains of the Saint Ladislaus Line. Long sections of continuous Hungarian communication and firing trenches were surveyed on foot, together with open firing positions established at key locations. Numerous remains of earth-and-timber bunkers were documented, as were observation posts constructed from locally available stone on dominant terrain features.

3. Oral History Interviews

A third method consisted of oral interviews. During field research, it was still possible to meet individuals who had personally witnessed the construction of the fortifications, the presence of Hungarian troops, and the military events of 1944 as older children or young adults.

These interviews provided valuable supplementary information regarding both the operation of the defensive system and local historical memory.

4. Empirical Research

The fourth methodological pillar consists of empirical research. Professional experience gained through extensive field surveys is systematically utilised and organised according to the objectives of the dissertation.

The combination of archival research, field investigation, oral history, and empirical analysis enables a comprehensive examination of the Hungarian defensive system in the Northeastern Carpathians.

STRUCTURE OF THE DISSERTATION AND CHAPTER-BY-CHAPTER SUMMARY OF THE RESEARCH

The first two chapters provide a historical overview of the development of defence systems and fortifications from antiquity to the twentieth century. They examine the linear and point-defence systems constructed in ancient times and analyse their operating principles. Many of these principles reappeared in the fortification concepts of the interwar period.

Medieval castles served defensive, administrative, and residential purposes simultaneously. By contrast, defensive systems constructed during the nineteenth and twentieth centuries were designed exclusively for military functions. Their design and defensive capabilities evolved in parallel with developments in firearms technology.

Interwar fortification concepts and their practical implementation reflected the requirements of mechanised warfare. Extensive fortification programmes were undertaken across Europe, most of them following the French Maginot principle developed during the 1920s, which was based on a static defensive concept.

Chapter 4: Hungarian Fortification Concepts Between the World Wars

The fourth chapter presents Hungarian military analyses, evaluations, professional studies, and debates concerning fortifications during the interwar period.

The chapter demonstrates that Hungarian military theorists rejected purely defensive and static fortification concepts and instead emphasised active defence. Their theories took into account the military-geographical characteristics of the territory to be defended, the challenges of mountainous terrain, and the economic capabilities of the country.

Chapter 5: The Hunyadi Line

The fifth chapter examines the Hunyadi Line and its role within the defensive system of the Northeastern Carpathians.

The research demonstrates that the Hunyadi Line constituted the outermost operational defensive belt of the Hungarian triple defensive system. Extending for approximately 300 kilometres, it functioned not as a continuous fortified line but as a network of defensive strongpoints, valley blocking positions, and engineering obstacles arranged in depth to close the principal avenues of attack.

The system was well adapted to the military geography of the Carpathians, exploiting mountain passes, river valleys, and dominant terrain features.

Through the analysis of German, Hungarian, and Soviet archival sources, it was possible to clarify the organisational structure, construction sectors, level of engineering development, and armament of the Hunyadi Line.

The documents demonstrate that the defence consisted of hundreds of firing positions, earth-and-timber shelters, trenches, and extensive minefields, wire obstacles, and anti-tank barriers constructed according to contemporary German field-fortification principles.

Analysis of the battles fought between July and September 1944 shows that the combat effectiveness of the Hunyadi Line depended not on permanent fortifications but on its defence-in-depth concept, resistance centres established on dominant terrain, and a well-organised fire system.

Despite their numbers advantage, Soviet forces achieved only slow progress while suffering considerable casualties.

The research confirms that the Hunyadi Line successfully fulfilled its operational mission by delaying the advance of the Red Army, inflicting attrition on attacking forces, and providing time for the occupation and preparation of the Saint Ladislaus Line and the Árpád Line.

Chapter 6: The Saint Ladislaus Line

The sixth chapter examines the Saint Ladislaus Line, constructed along the Carpathian watershed and the state border, and analyses its role within the defensive system of the Northeastern Carpathians.

The research demonstrates that the Saint Ladislaus Line was not merely an intermediate defensive position but the second major defensive belt of the Hungarian triple defensive system. Extending for approximately 400 kilometres along the principal watershed of the Carpathians, it secured all major mountain passes and communication routes while maintaining close operational links with both the Hunyadi Line and the Árpád Line.

Archival evidence and field investigations reveal that the Saint Ladislaus Line was constructed as a defence-in-depth field-fortification system. Its defensive centres were organised around key mountain passes, dominant terrain features, and transportation corridors.

The system consisted of trenches, shelters, machine-gun and anti-tank positions, and extensive engineering obstacles. Documents and field surveys conducted in the regions of the Uzsok, Orosz, and Tatár Passes confirm that the fortifications were built in accordance with contemporary German-Hungarian field engineering principles.

During the Carpathian Operation, the Saint Ladislaus Line significantly slowed the advance of the 4th Ukrainian Front. In many sectors, Soviet forces were able to capture the passes only after prolonged fighting and heavy losses.

The research demonstrates that Soviet successes were achieved primarily through outflanking maneuvers rather than direct frontal assaults.

Available Hungarian, German, and Soviet sources confirm that the Saint Ladislaus Line fulfilled its operational mission by delaying the Red Army, contributing to the attrition of attacking forces, and providing the time necessary for the orderly occupation and defence of the Árpád Line.

The Soviet capture of the entire Carpathian watershed was only completed on 18 October 1944, after nearly forty days of continuous offensive operations.

Chapter 7: The Árpád Line

The seventh chapter examines the construction, reinforced-concrete structures, and military role of the Árpád Line.

The research demonstrates that the Árpád Line represented one of the most successful practical applications of Hungarian military approach and fortification theory.

Rather than functioning as a continuous fortified line, the system consisted of operationally independent valley blocking positions controlling the principal communication routes through the Carpathians.

The fortifications combined natural terrain obstacles with modern engineering solutions to provide an effective mountain defence.

The investigated defensive sectors—including the Ung, Latorca, Talabor, Nagy-Ág, Tisza, and Tarac valley systems—illustrate both the coherence of Hungarian fortification concepts and their adaptation to military-geographical conditions.

Archival sources, contemporary engineering documents, and field investigations demonstrate that the Árpád Line was a defence-in-depth fortification system designed for combined-arms defence.

Reinforced-concrete combat positions, shelters, artillery positions, and observation posts were complemented by extensive field fortifications, obstacle systems, and a fire plan carefully integrated with the terrain.

The system incorporated contemporary European fortification principles while simultaneously adapting them to Hungarian military-geographical and economic realities.

During the Carpathian Operation, several sectors of the Árpád Line demonstrated considerable combat effectiveness. Soviet forces frequently advanced only after sustaining heavy casualties, conducting prolonged operations, or bypassing defensive centres.

Research findings indicate that several key defensive sectors—such as the valley blocking positions at Körösmező, Volóc, and several locations in the Ung Valley—could not be penetrated through direct assault and fell only after the organised withdrawal of Hungarian forces.

A comparison of Hungarian, German, and Soviet sources confirms that the Árpád Line fulfilled both its strategic and operational missions. It significantly delayed the Red Army, contributed to the defence of the Carpathian passes, and enabled the orderly withdrawal of Hungarian and German forces into the Carpathian Basin.

The research further confirms that the Árpád Line may be regarded as one of the most effective mountain defensive systems of the Second World War.

Chapter 8: The Post-War Legacy of the Árpád Line

The eighth chapter examines the history of the Árpád Line from 1944 to the present day.

The research demonstrates that the history of the Árpád Line did not end with the withdrawal of Hungarian forces in 1944. The Red Army conducted detailed surveys of the valley blocking positions and analysed their engineering solutions, incorporating the lessons learned into its own fortification doctrine.

As a result of Soviet military-topographical surveys, many elements of the system subsequently appeared on military maps.

The research further reveals that several structures of the Árpád Line continued to play a role during the period of armed resistance in Transcarpathia after 1944. Local memory and available sources indicate that certain fortifications remained in military use until the early 1950s.

Following the political transformations of the post-Cold War era, the Árpád Line gradually became part of historical memory and military heritage tourism. Educational trails, information boards, and exhibition sites have been established in several valley sectors of Transcarpathia, contributing to the preservation and presentation of Hungarian military heritage.

The results of this research have directly contributed to the development of several tourism projects and interpretive routes. Consequently, the Árpád Line today represents not only a military-historical monument but also one of the most significant cultural and tourism assets of the region.

SUMMARY OF THE DISSERTATION

General Conclusions

The triple Hungarian defensive system established in the Northeastern Carpathians—the **Hunyadi Line**, the **Saint Ladislaus Line**, and the **Árpád Line**—formed a unified, defence-in-depth structure, which was created according to a coherent operational concept. Adapted to the specific requirements of mountain warfare, the system relied upon the deliberate exploitation of natural terrain obstacles and communication corridors.

The fundamental principle of the system was not the rigid closure of mountain passes but rather the channeling of attacking forces into predetermined directions, followed by their delay and attrition within the inner valleys.

The Hunyadi Line functioned as a front defensive belt, playing its primary role during the initial phase of the Soviet offensive. Although certain sectors were penetrated, it successfully gained time and enabled the orderly withdrawal of defending forces and the redistribution of defensive efforts.

The Saint Ladislaus Line served a different function. By controlling ridgelines and mountain passes and exploiting the advantages of the terrain, it restricted enemy outflanking movements and constituted the second major defensive belt.

The Árpád Line, with its system of inner valley barriers, formed the actual main line of defence.

The valley-blocking system—particularly in the Latorca, Ung, and Fekete-Tisza valleys, which were subjected to major Soviet attacks—effectively exploited terrain-imposed movement corridors. It enabled the defenders, despite relatively limited manpower, to exert a significant delaying effect through organised resistance and local counterattacks.

The outcome of the fighting demonstrated that the limited number of communication routes, the difficult terrain, and adverse weather conditions significantly slowed Soviet operations and forced the attackers into a gradual, direction-bound advance.

At the same time, the long-term defence capability of the system was determined less by engineering limitations rather than by the deterioration of the overall operational situation and the increasingly unfavourable balance of forces.

Following the failure of frontal breakthrough attempts, Soviet forces shifted their operational focus and increasingly relied on secondary routes and mountain crossings. The worsening

operational situation and the danger of encirclement ultimately forced the gradual abandonment of the defence system and the withdrawal of Hungarian forces.

Overall, it can be concluded that the Árpád Line represented a modern mountain defence system that adapted exceptionally well to the terrain despite limited resources. Its fundamental principles corresponded to the operational requirements of the period. On both tactical and operational levels, it proved particularly suitable for delaying and attritional defence and, under more favourable strategic circumstances, could likely have sustained resistance for a considerably longer period.

Verification of the Hypotheses

1. Characteristics of the Hungarian Fortification Concept

The examination of Hungarian military literature from the interwar period clearly demonstrated that Hungarian fortification approach—particularly through the theoretical works of Teofil Hárosy—was not a simple adaptation of the static reinforced-concrete systems of Western Europe.

Instead, it represented a concept specifically tailored to Hungarian circumstances.

The research established that the core of the Hungarian defence concept was a defence-in-depth system designed to provide progressively increasing resistance. Its purpose was to wear down attacking forces, restrict their freedom of movement, and create opportunities for counterattacks.

Rather than investing in extensive and costly permanent fortifications, the concept relied on terrain exploitation, well-concealed obstacle systems, and flexible troop employment.

The study further demonstrated that limited economic resources, geopolitical realities, and the distinctive military-geographical characteristics of the Carpathians all played a decisive role in shaping this doctrine.

The hypothesis is therefore fully confirmed: Hungarian fortification theory constituted an independent defence concept that developed alongside, yet distinctly from, contemporary Western European fortification trends.

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2. The Military-Geographical Foundations of the Triple Defence System

The research confirmed that the Hunyadi Line, the Saint Ladislaus Line, and the Árpád Line formed a deliberately constructed defence-in-depth system whose organising principle was the maximum utilisation of military-geographical conditions.

Detailed analysis demonstrated that the defence system was not linear but consisted of functionally differentiated defensive zones:

- the **Hunyadi Line** served as a forward delaying belt along the northern foothills of the Carpathians;
- the **Saint Ladislaus Line** controlled mountain passes and restricted outflanking movements along the main watershed;
- the **Árpád Line** formed the principal line of resistance through its reinforced-concrete valley blocking positions.

Field surveys and topographical analysis proved that the valley blocking positions were not isolated structures but components of an integrated defence network incorporating secondary valleys, ridge crossings, transverse routes, and forestry infrastructure.

The hypothesis is fully confirmed, as both the design and operation of the defence system were based upon the conscious and comprehensive exploitation of military-geographical space.

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3. Operation of the Defence System During Combat

Analysis of operational events demonstrated that the Hungarian defence system was capable of fulfilling its intended role of delaying, disrupting, and wearing down attacking forces.

The advance of the Red Army in the Carpathian region slowed significantly along the principal attack routes, while Soviet troop movements became constrained by both terrain and the defence system itself.

The research also demonstrated that the effectiveness of the system cannot be evaluated solely at the tactical level but must be understood within its broader operational and strategic context.

Changes on the Eastern Front—particularly Romania’s defection, Soviet breakthroughs in neighbouring sectors, and, to a lesser extent, the political events of 15 October 1944—substantially reduced the possibilities available to Hungarian defenders.

Consequently, the abandonment of the defence system resulted not primarily from tactical shortcomings but from the deterioration of the operational situation and the overwhelming superiority of Soviet forces.

The hypothesis is therefore largely confirmed, although it requires the addendum that the effectiveness of the defence system can only be properly evaluated in its full operational context.

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4. The Post-War Legacy and Contemporary Significance of the Árpád Line

The research confirmed that the fortifications of the Árpád Line did not immediately lose their military relevance following the Second World War.

During the armed conflict between the Ukrainian Insurgent Army (UPA) and the NKVD, many structures continued to serve military purposes.

Field investigations and documentary evidence indicate that the fortifications functioned as hiding places, supply depots, and temporary bases, demonstrating their continued military utility.

The study further established that surviving structures, terrain remains, historical maps, and archival records collectively enable the identification and partial reconstruction of numerous elements of the defence system.

Research has shown that the structure, location, and interrelationships of the valley blocking positions can only be fully understood in conjunction with the military-geographical characteristics of the region.

This provides valuable opportunities for the modern analysis and reassessment of Hungarian mountain defence doctrine.

The research also demonstrated that the defence system has become an important element of military-historical heritage. Its preservation, study, and tourism-related utilisation have gained increasing significance.

The surviving structures provide valuable information for military history, military geography, heritage conservation, and territorial defence studies, although practical utilisation continues to be influenced by territorial, legal, and geopolitical considerations.

The hypothesis is considered confirmed, as the post-war legacy of the defence system can be demonstrated across military, historical, social, and cultural dimensions.

Overall Assessment

The examination of the hypotheses confirms that the Hungarian defence system established in the Carpathians should not be interpreted as a static fortification system but rather as a terrain-adapted, defence-in-depth, and operationally flexible system.

The results of the research contribute to a broader understanding of the Árpád Line, presenting it not merely as a fortification system but as a complex defensive model closely adapted to both military geography and the operational environment.

New Scientific Results

The new scientific results achieved during the research may be summarised as follows:

1. Identification of the Characteristics of Hungarian Defence Doctrine

(Research Objective 1; Hypothesis 1)

Archival research demonstrated that Hungarian fortification theory between the two world wars—particularly based on the work of Teofil Hárosy—differed substantially from the static Maginot-type systems of Western Europe.

The study established that Hungarian doctrine was based upon active defence, flexibility, and defence in depth. It further demonstrated that this doctrine emerged through the interaction of military considerations, economic constraints, geopolitical pressures, and military-geographical realities, resulting in a distinctive and cost-effective defence concept.

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2. Identification of the Complex Military-Geographical Structure of the Triple Defence System

(Research Objective 2; Hypothesis 2)

Field research demonstrated that the Hunyadi Line, the Saint Ladislaus Line, and the Árpád Line did not constitute isolated defence positions but rather an unified, mutually supporting operational system organised in depth.

The research further established that the valley blocking positions of the Árpád Line functioned not as linear fortifications but as nodal resistance centres associated with key terrain sectors and designed according to defence-in-depth principles.

Their effectiveness depended upon terrain characteristics and opportunities for tactical maneuver.

3. Reassessment of the Combat Employment of the Defence System

(Research Objective 3; Hypothesis 3)

The research demonstrated that the slowing and, in some sectors, temporary halting of Soviet offensives resulted not merely from difficult terrain but from the deliberate depth, flexibility, and operational design of the Hungarian defence system.

The system proved capable of disrupting offensive momentum and channeling enemy movements into predictable directions.

At the strategic level, however, the abandonment of the system was determined by changes in the broader military situation—particularly Romania's defection, Soviet breakthroughs, and the political events of 15 October 1944—rather than by deficiencies in the defence concept itself.

3a. Demonstration of the Interaction Between the Defence System and the Operational Environment

A new interpretative approach developed during the research demonstrating that the effectiveness of the Árpád Line can only be understood within the broader dynamics of the Eastern European theatre of war.

The defence system cannot be evaluated independently of the changing operational environment.

This approach moves beyond traditional static evaluations of fortifications and places the system within a comprehensive operational framework.

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4. The First Comprehensive Interpretation of the Post-War Legacy of the Árpád Line

(Research Objective 4; Hypothesis 4)

The research established that the fortifications of the Árpád Line did not entirely lose their military relevance after the Second World War.

During the conflict between the UPA and the NKVD, several structures continued to function as elements of local military infrastructure.

The study also examined the present condition and utilisation possibilities of the defence system and demonstrated how the Árpád Line has acquired new functions in the twenty-first century as a component of military heritage and cultural memory.

The results of the dissertation contribute to a reassessment of Hungarian fortification theory and confirm that the Árpád Line should be viewed not as an outdated system but as an innovative defence concept adapted to the military-geographical and economic realities of its time.

Practical Applicability of the Results

The findings of the dissertation can be directly utilised in several scientific and practical fields, as the examination of the Carpathian defence system provides not only a historical reconstruction but also broader military-geographical and operational conclusions of general relevance.

One of the most important findings of the research is the demonstration that, in mountain warfare, the effectiveness of defence depends not primarily on continuous linear fortifications but on the channeling of movement routes and the control of key terrain features, particularly valleys and mountain passes. This approach may be applied in higher military education, the teaching of operational theory, and the interpretation of historical and contemporary mountain warfare operations.

The analytical framework developed during the dissertation offers the possibility of formulating a generalised model of mountain defence that can be applied to the study of other regions. The network-oriented interpretation of valley blocking positions may be particularly valuable in military-geographical analyses and operational reconstructions.

The methodological results of the research—especially the integrated use of field surveys, archival sources, and military cartography—may serve as a model for other military-historical investigations, particularly in regions where documentary sources are incomplete and terrain remains play a crucial role.

The identification, documentation, and classification of the structures of the Árpád Line contribute to the preservation and utilisation of military heritage. The results can be employed in the development of military-historical educational trails, thematic routes, and interpretation centres, enabling the presentation of the defence system as a coherent whole rather than as a collection of isolated objects.

The research findings are also significant from the perspective of regional historical memory and identity, since the Árpád Line can be interpreted not only as a military phenomenon but also as a component of social, cultural, and environmental heritage.

Overall, the results of the dissertation contribute not only to the study of Hungarian military history, but also provide generalisable conclusions that may prove useful for both the theoretical and practical interpretation of mountain warfare.

Within the framework of the **Adaptive Hussars 2025 (ADHU 25)** national defence exercise, I was invited by Brigadier General János Somogyi, Commander of the Operations Directorate of the Hungarian Defence Forces Headquarters, to provide a professional briefing and consultation in October 2025. The presentation addressed the general characteristics of the Northeastern Carpathians, their transportation infrastructure, and the current condition of the valley blocking positions and fortifications of the Árpád Line.

PUBLICATIONS RELATED TO THE TOPIC BY THE AUTHOR

1. **Rakaczki, István:** *Erődített körzetek a Szovjetunió nyugati határai mentén*
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4. **Rakaczki, István:** *A légierő alkalmazásának főbb doktrinális kérdései a korai szovjet elméletekben és alkalmazásának egyes aspektusai a második világháború során*
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5. **Rakaczki, István:** *Orosz és szovjet hírszerzés 1939-ig*
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7. **Rakaczki, István:** *A Hunyadi-állás*
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8. **Rakaczki, István:** *Magyar védelmi rendszerek az Északkeleti-Kárpátokban. Szent László-állás*
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9. **Rakaczki, István:** *Structures of the Árpád Line*
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10. **Rakaczky, István–Rusz, Ferenc:** *Magyar katonai erődítések a Keleti-Kárpátokban* (**Hungarian Military Fortifications in the Eastern Carpathians**)
FVE, Göd, 2009.

11. **Rakaczki, István:** *Венгерская оборонительная система в Карпатах* (**The Hungarian Defence System in the Carpathians**)
Military History of Ukraine: Galicia and Transcarpathia. Scientific Collection. Kyiv, Ministry of Defence of Ukraine, National Military History Museum of Ukraine, 2014, pp. 357–363.

CURRICULUM VITAE

I was born on **22 October 1955** in **Szikszó, Hungary**, and I am a first-generation intellectual.

In 1974, I graduated from the Physics Programme of the Ferenc Földes Secondary Grammar School in Miskolc. Subsequently, I studied at the **Moscow Textile Institute**, where I obtained a degree in Chemical Engineering in 1979. In the same year, I earned an advanced-level Russian language qualification associated with my university degree and also passed an intermediate-level examination in Polish in Moscow.

I began my professional career in Budapest in 1979. Between 1980 and 1981, I completed eighteen months of compulsory military service in the 4105th Air Defence Missile Regiment.

From 1981 to 1985, I worked as an engineering instructor in Újfehértó. In 1984, I earned a degree in engineering teacher training from the **Budapest University of Technology**.

Between 1985 and 1988, I taught in Miskolc. During this period, in 1987, I participated in a one-month military retraining programme within the Hungarian Armed Forces.

Between 1990 and 1992, I served as Managing Director of **INTERKÁRPÁTIA Ltd.**, an Austrian-Ukrainian-Hungarian joint venture engaged in domestic and international trade.

In 1992–1993, I completed the management programme of **The Open University**, where I also pursued studies in marketing and economics.

Between 1992–2003 and again from 2004–2008, I worked as managing director of my own company. Our main activities included tourism services, travel guide publishing, tourism project development, consultancy, and education. I acted as an editor and co-author of a tourist guidebook series covering Borsod-Abaúj-Zemplén County and served as reviewer of several tourist maps and tourism publications.

From 1990 to 2003, I was the elected President of the Borsod-Abaúj-Zemplén County Hiking Association. Between 2000 and 2003, I served as elected Vice-President of the Hungarian Ramblers' Association, and between 2003 and 2004 as its full-time Secretary General. In 1995, I was awarded the **Miksa Esterházy Memorial Medal** in recognition of my work.

Between 2008 and 2016, I worked at the **Herman Ottó Institute** (formerly VKSZI and NAKVI), first as a Rural Development Network Coordinator and later, from 2010, as a Vocational Training Specialist in Environmental Protection and Water Management. Throughout this period, I was responsible for international professional cooperation in Russian

and Polish with partner organisations in Poland, Slovakia, and Lithuania within the framework of European Union rural development programmes.

From 2017 until my retirement, I served as Training Manager at **VIZITERV Environ Ltd.**

Between 2006 and 2014, I was a member of the Financial Supervisory, Public Procurement and Legal Committee of the Municipality of Göd.

My interest in the Árpád Line began in 2003 while working as a tour guide. Between 2004 and 2020, I conducted extensive research into the Hungarian defence system. Every year, I spent at least one or two weeks in Transcarpathia carrying out field investigations.

Between 2016 and 2019, I traversed the entire high-mountain border region of Transcarpathia along the Carpathian ridge. As a result of these investigations, a short guidebook was published in 2005, followed by a comprehensive book on the Árpád Line in 2009.

In 2014, I participated in the online conference *"Transcarpathia and Galicia"* organised by the Ukrainian Military History Museum. My Russian-language presentation was subsequently published in the conference proceedings.

In 2021, I was admitted to the **Doctoral School of Military Sciences** at the **National University of Public Service**. During my doctoral studies, I delivered presentations at several professional conferences.

I successfully completed the comprehensive doctoral examination in 2023 and obtained my doctoral absolutorium in 2025.

Göd, 2026

István Rakaczki