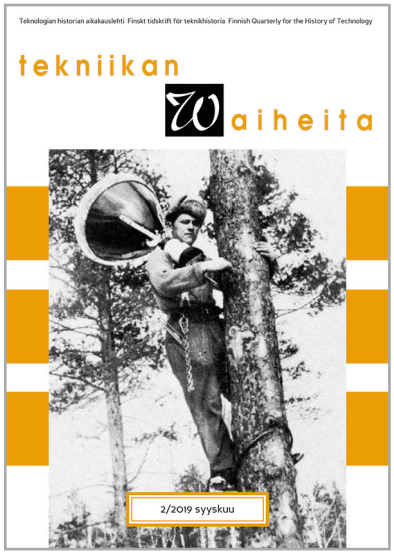

Tekniikan Waiheita
ISSN 2490-0443
Tekniikan Historian Seura ry.
37. vuosikerta:2
2019
https://journal.fi/tekniikanwaiheita

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To cite this article: Michael Halila, "The development of Finnish anti-tank weapons, 1918–1939: doctrine, procurement and national industrial policy" Tekniikan Waiheita 37, no. 2 /2019): 70–83. https://dx.doi.org/10.33355/tw.84897

To link to this article: https://dx.doi.org/10.33355/tw.84897

The development of Finnish anti-tank weapons, 1918–1939: doctrine, procurement and national industrial policy

Michael Halila[1]

Since the introduction of tanks to the modern battlefield in the First World War, anti-tank defenses have been an indispensable part of most armies' equipment. Deciding what kind of anti-tank weapons are needed, however, is by no means trivial. This article examines the Finnish army's efforts to acquire anti-tank armament in the interwar period, through factors of military doctrine, procurement and economic policy. Shortcomings in each area combined to delay acquisitions: despite evidence to the contrary, Finnish officers believed that armored warfare in Finnish terrain was impossible, the army's procurement system was chaotic, and the production of anti-tank guns was subordinated to national industrial policy.

Introduction

During the Soviet invasion of 1939–40, known in Finland as the "Winter War", Finnish improvised anti-tank methods became famous around the world. The popular name still used of a petrol bomb created by stuffing a rag into a bottle containing an incendiary liquid, the Molotov cocktail, dates from the Winter War.[2] These methods were not invented during the war, but were the result of frantic last-minute work by the Finnish Army to remedy the great deficiencies in its anti-tank armament. Other methods included preparing explosive charges by tying hand grenades into bunches, sticking logs or crowbars into tank treads, and even felling trees onto advancing tanks. These measures all required Finnish soldiers to get very close to enemy tanks, and entailed severe casualties.[3] Why did the Finnish army have to resort to such desperate measures?

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[2] According to the traditional story, the Molotov cocktail was named after Soviet minister for foreign affairs Vyacheslav Mikhailovich Molotov, who allegedly gave a speech denying Soviet air attacks on the Finnish capital Helsinki, claiming that Soviet aircraft were dropping bread. The Finns named the RRAB-3, a cluster incendiary bomb used in the attacks, "Molotov's breadbasket", and a name for the improvised petrol bomb was derived from this, as a drink to go with the bread ("How the Molotov Cocktail Got Its Name." *New York Times*, Nov. 20 1986; the writer has misunderstood the RRAB-3 as an anti-tank weapon). Although the story has been repeated many times, it is unclear if Molotov ever gave such a speech.

An alternative etymology is offered by the Oxford Essential Dictionary of the US Military, which claims that "the production of similar grenades was organized by Soviet foreign minister Vyacheslav Molotov during World War II" (The Oxford Essential Dictionary of the U.S. Military. Oxford University Press, 2002 online version, accessed 15.5.2019). This seems a highly unlikely source for the name, as an article in the June 1941 issue of Popular Science, written before the German invasion of the Soviet Union, already refers to these improvised petrol bombs as "Molotov cocktails" ("Homemade tank bombs." Popular Science, June 1941). Although petrol bombs were used in earlier conflicts, this particular name for them appears to originate from the Finnish Winter War. Given that the Finnish and Polish armies that the Soviets fought prior to the German invasion represented a negligible armored threat, it stretches credibility that a Soviet cabinet minister would have been assigned to oversee the production of improvised anti-tank weapons during either campaign.

[3] Erkki Käkelä. *Marskin panssarintuhoojat. Suomen panssarintorjunnan kehitys ja panssariyhtymän panssariyksiköiden historia.* WSOY, 2000., 154–158, 162.

Picture 1. Nurse Aili Sipilä is being shown a captured Soviet 45mm anti-tank gun at Louhivaara, July 1941. SA-kuva CC BY 4.0.

In this article, I present a synthesis of previous research and archival materials to create what I believe is the first complete account of the process by which the Finnish army came to neglect anti-tank warfare and then failed to remedy this neglect before the outbreak of the Winter War in 1939. The article is divided into three sections. The first deals with army doctrine, which sets the necessary conditions for weapons system acquisition: an army will not be interested in acquiring a weapons system that it sees no need for. The second examines the state of the army's procurement process; once a need for a weapons system is established, the army needs to select which system it wishes to acquire. Finally, the acquisition of anti-tank weapons is set in the context of Finnish national industrial policy.

Earlier research has admitted that anti-tank weapons were neglected in the interwar period. Lieutenant Colonel Erkki Käkelä, who served in the peacetime Armored Brigade and has written a history of anti-tank warfare in Finland, admits that Finnish anti-tank weapon procurement was slow, but insists that the decisions were made approximately at the same time as in other European nations, and any criticism of the army is "hindsight". He lays the blame on the Finnish arms industry.[4] Major General Vesa Tynkkynen identifies the army's belief in the impassability of Finnish terrain to tanks as a key reason for this oversight, and

[4] Käkelä, *Marskin panssarintuhoojat*, 41–54, 68–69; *"jälkiviisautta"*.

Picture 2. Finnish soldiers exhibit an anti-tank explosive charge and a Molotov cocktail in the last days of the Winter War, March 1940. SA-kuva CC BY 4.0.

finds a change in this thinking in the 1930's.[5] The official history of the Finnish defense establishment agrees, citing a lack of interest in developing anti-tank warfare at all in the 1920s.[6] I argue that in addition to these factors, the chaotic procurement process of the Finnish Army also played a part, as well as the German-trained Finnish officers' nationalist ideas of Finnish terrain. These were only seriously challenged in the 1930s, but weapons procurement still failed due to the army's inability to select a weapon system, and the insistence that it be produced domestically, despite the lack of a suitable industrial capacity.

Doctrine

The Finnish Army was a conspicuously early adopter of armor in Northern Europe. In 1919, the army procured 32 Renault Modèle 1917 tanks from France, 14 armed with 37mm guns and 18 with machine guns.[7] Grouped into an armored regiment, these tanks repre-

[5] Vesa Tynkkynen. *Hyökkäyksestä puolustukseen. Taktiikan kehittymisen ensimmäiset vuosikymmenet Suomessa.* Maanpuolustuskorkeakoulu, taktiikan laitos, julkaisusarja 1, 1/1996. 80–81.

[6] Jarl Kronlund. *Suomen puolustuslaitos 1918–1939. Puolustusvoimien rauhan ajan historia.* WSOY, 1988, 438.

[7] Jouni Sillanmäki. *Voiton vaunut. Renault Modèle 1917 ja niiden käyttö Suomessa.* Panssarimuseon julkaisu n:o 4, 2012, 48–50.

sented a larger armored force than those of Sweden or the Red Army at the time.[8] The army also inherited an artillery park of almost 1 000 pieces from the Russian army, although slightly over half of these lacked modern recoil systems.[9] Some dozens of 37mm guns were assigned to the infantry, but they were already obsolescent in the 1920's.[10]

As Elizabeth Kier has argued, a military organization's culture shapes how it responds to external threats.[11] For example, in the interwar period, the French Army had an entrenched belief that conscript troops were unsuitable for offensive operations. This led the French Army to adopt a defensive doctrine.[12] While Kier's theory deals with doctrine, its application to procurement is clear: if an army does not see a need for a weapons system, they will not be interested in procuring it. This is what happened to the Finnish Army: changes in military culture led to changes in the army's procurement plans.

Initially, Finnish officers were in favor of equipping the infantry with infantry guns. An artillery committee convened by the Minister for War in 1921 recommended the acquisition of 20mm infantry guns. If 90 guns were purchased, the infantry battalions in the most crucial roles could be equipped with at least one gun. The committee differed on whether the guns should be controlled by the infantry or artillery.[13]

In the summer of 1920, the army conducted tank trials in the strategically important Karelian Isthmus, which concluded that tanks could be used in some areas.[14] Later research has claimed that the misinterpreted results of these trials were the reason for the neglect of anti-tank defenses in the 1920's and early 30's.[15] This is not the case. Discussions on the anti-tank capabilities of infantry guns continued well past the trials; in the autumn of 1920, Colonel Ludwig Schwindt of the War Ministry believed that any infantry guns acquired for the army should be at least 57-75mm in caliber to ensure that they were effective against tanks.[16] The parliamentary "defense revision" committee, set up in 1923 and consisting of civilian politicians and career military officers, examined the question of armor. The committee's report in 1926 repeated the Isthmus trials' conclusions, stressing that the employment of armor would be possible on that crucial battleground. While the report made no specific recommendations for anti-tank weapons, it stated that because the heavy forest cover made direct artillery support impractical, the infantry would need to be equipped with infantry guns.[17] Each infantry battalion was to have an organic infantry gun platoon.[18] A total order of 197 guns was recommended.[19]

[8] Tynkkynen, *Hyökkäyksestä puolustukseen*, 82.

[9] Kronlund, *Suomen puolustuslaitos 1918–1939*, 70–71.

[10] Markku Palokangas. Suomen panssarintorjunnan tykkiaseistus. *Sotahistoriallinen aikakauskirja* 17, 1998, 22.

[11] Elizabeth Kier. Culture and Military Doctrine: France between the Wars. *International Security*, Vol. 19, No. 4 (1995): 65-93, 69–71.

[12] Elizabeth Kier. Culture and Military Doctrine: France between the Wars. *International Security*, Vol. 19, No. 4 (1995): 65-93., 74–75 *et passim*.

[13] Hannu Liimatta, *Ulkomaisista esikuvista kohti omaperäisempiä ratkaisuja. Itsenäisen Suomen jalkaväkitaktiikan kehittämisen neljä ensimmäistä vuosikymmentä*. Maanpuolustuskorkeakoulu, Helsinki 2018, 176–178.

[14] Tynkkynen, *Hyökkäyksestä puolustukseen*, 80.

[15] e.g. Liimatta, *Ulkomaisista esikuvista kohti omaperäisempiä ratkaisuja*, 176.

[16] Liimatta, *Ulkomaisista esikuvista kohti omaperäisempiä ratkaisuja*, 175–178.

[17] Puolustusrevisioni R-632/2, 52–53, 329.

[18] Puolustusrevisioni R-632/2, 399.

[19] Puolustusrevisioni R-632/3, 541–542.

These plans were derailed by a change in the army's culture. At its founding in 1918, the Finnish Army was officered by Russian-trained officers, and German-trained *Jäger* officers, so named for their service in a German Army *Jäger* battalion in the First World War. The Russian-trained officers held the highest-ranking posts in the fledgling army, while the *Jäger* officers, none of whom had general staff training or higher military education, were more numerous but in lower-ranking posts. There was considerable tension between the two groups, exacerbated by the *Jäger* officers' racism against anything associated with Russia. These tensions came to a head in 1924, when the majority of German-trained officers in the army threatened to resign unless the Russian-trained officers were purged from the officer corps. Facing the resignation of the majority of the army's officers, the government surrendered to the German-trained officers' demands.[20]

The *Jäger* mutiny ushered in an era where the German-trained officers manned all of the notable posts in the Finnish Army, and took charge of shaping doctrine. The *Jägers* justified the purging of Russian-trained officers from the army on racist grounds, accusing them of having "become Russian"[21]. The *Jäger* officers portrayed their Russian-trained colleagues as foreign, backward and un-Finnish, and conversely themselves as modern and above all national.[22] A key part of the national character of the *Jägers* was their insistence on the unique national characteristics of the Finnish landscape. Finnish national identity has long been rooted in conceptions of the Finnish landscape[23], and the *Jägers* produced a military version of this Finnish scenic nationalism.

In 1924, the Finnish military journal *Sana ja Miekka* published an editorial titled "The forests and national defense", calling for a national military doctrine. The anonymous writer attacked the earlier military for "blindly imitating" foreign countries and their military doctrines, even though the climate and terrain of those countries was "completely different" from Finland. A Finnish doctrine must be one that takes into account the particular conditions of Finland's forests, which, according to the author, made it difficult or even impossible to use tanks or heavy artillery.[24] A similar opinion was repeated in almost all military journal articles that dealt with tanks until the 1930s.[25]

A particularly dramatic example is an article by *Jäger* Colonel Edvard Hanell, published in 1929 in *Sotilasaikakauslehti*, Finland's most influential military journal. Hanell compared Finnish and "Central European" terrain by likening them to a photograph and its negative: complete opposites. Where Hanell described Central Europe as a flat, featureless plain occasionally broken up by small stretches of forest, he considered Finland its polar opposite: a land totally covered by forests.[26] In such impassable terrain, the *Jäger* officers

[20] Michael Halila, "Suomen armeija ja kansalaissodan pitkä varjo: Jääkärien sotataito 1918–1939". *Historiallinen Aikakauskirja* 116, no. 2 (2018): 167–180. 172–173.

[21] Laaksonen, Lasse. *Mistä sotakenraalit tulivat. Tie Mannerheimin johtoon 1918-1939*. Helsinki-kirjat, 2011, 82–86.

[22] Michael Halila, "Suomen armeija ja kansalaissodan pitkä varjo: Jääkärien sotataito 1918-1939". *Historiallinen Aikakauskirja* 116, no. 2 (2018): 167–180. 173–174.

[23] Matti Peltonen. Between Landscape and Language. The Finnish National Selflmage in Transition. *Scandinavian Journal of History*, vol. 25, no. 4 (2000): 265–280.

[24] *Sana ja Miekka* 19/1924, Metsät ja maanpuolustus.

[25] Michael Halila. *"Onko hyökkäysvaunuilla mitään tulevaisuutta meillä?" Suomalainen panssariajattelu ja puolustusvoimien maastokäsitys 1919-1939*. ["Do tanks have any future with us? Finnish armored thought and the army's conception of Finnish terrain] Master's thesis, University of Helsinki, 2015, 53–63.

[26] Edvard Hanell. Maasto meillä ja Keski-Euroopassa; vertailuja taktillisessa suhteessa. *Suomen Sotilasaikakauslehti* 1929, s. 337–351.

Picture 3. Destroyed Soviet tank, Winter War, 1940. Contrary to what Finnish officers believed before the war, Soviet armor was able to operate in Finland's forests – albeit with mixed results. SA-kuva CC BY 4.0.

believed, tanks could not be used at all; therefore anti-tank weapons would not be necessary, and plans for the acquisition of infantry guns were shelved. Instead, mortars were acquired for the infantry and the development of a direct-fire support capacity for the infantry was neglected.[27]

The *Jäger* supremacy was only seriously challenged in the early 1930's, when officers trained in the Finnish peacetime military establishment started rising through the ranks of the Army. This led to the *Jägers'* ideas of the Finnish landscape being challenged, and Finnish doctrine finally admitted the possibility of armor being deployed against the Army. This in turn gave rise to numerous calls in military publications for anti-tank weapons to be procured.[28] In 1934, new tank trials were arranged in the Karelian Isthmus, mostly using the same Renault tanks that were used in 1920, and they produced the same results: the employment of armor on the Isthmus was possible.[29] As the *Jäger* supremacy faded, the need for anti-tank weapons was again realized.

[27] Liimatta, *Ulkomaisista esikuvista kohti omaperäisempiä ratkaisuja*, 177.

[28] Michael Halila, "Suomen armeija ja kansalaissodan pitkä varjo: Jääkärien sotataito 1918-1939" [The Finnish Army and the long shadow of civil war: the *Jäger* art of war 1918-1939]. *Historiallinen Aikakauskirja* 116, no. 2 (2018): 167–180, 177–179, Halila, *"Onko hyökkäysvaunuilla mitään tulevaisuutta meillä?"*, 64–82.

[29] Halila, *"Onko hyökkäysvaunuilla mitään tulevaisuutta meillä?"*, 76. The trials were run with 6 Renault FT tanks, and one Carden Loyd tankette, one Vickers Light tank and one Vickers Medium tank. Yleisesikunta. Koulutustoimisto (toimisto X). 14 Salainen kirjeenvaihto (1934-1934). T-17645/10, Finnish National Archive; *contra* Tynkkynen, *Hyökkäyksestä puolustukseen*, 81.

Procurement

Once the army's culture had changed and the need for anti-tank weapons was accepted, the next step was to select a weapon system. This was not an easy task. In the 1920s, the Finnish army had no unified system for procurement, or even budgeting.[30] The Great Depression also obviously affected the Finnish state's capacity to invest in its armed forces.[31] By 1934, the situation had not decisively improved. In November 1934, Major-General Aarne Heikinheimo, the inspector of infantry, wrote to the commander of the armed forces on the subject. Heikinheimo argued that the army was either too slow or entirely unable to resolve questions relating to infantry weapons. He quoted several examples, and points out that "approximately two years ago" (i.e. 1932) the general staff had requested that the defense ministry organize firing trials with all infantry weapons in service, so up-to-date range tables could be produced. The ministry had handed the task down to the inspector's office, which completely lacked the resources to complete it, and the tables had never been produced. In the meantime, the army's 81mm Stokes mortars had range tables based on French ammunition; in practice, it had been found that the ranges of the Finnish-made ammunition were up to 300m shorter.[32] In short, the army was not even capable of evaluating the weapons systems it was already using in everyday training, let alone developing requirements for new systems.

To rectify the situation, Heikinheimo suggested that a permanent committee for the development of infantry weapons be set up. He admitted that the budget situation does not permit the creation of new posts, and proposed a substitute system that would enable officers needed for the committee to be temporarily absent from their other duties.[33] The same problem had plagued the defense revision committee of 1926.[34] In October 1935, almost a year after Heikinheimo's memorandum, the general staff proposed the establishment of several committees to evaluate weapons systems for acquisition. First among these was the infantry and anti-aircraft weapon type committee, whose responsibility was to evaluate and make a recommendation on everything from pistols and sub-machinegun magazines to anti-aircraft searchlights and weapon repair facilities. One of the twelve listed systems was an anti-tank gun. The committee had three permanent members: commander of the anti-aircraft regiment, colonel Melander; major Linkomies of the Ministry of Defense, and captain Martti Terä from the infantry inspector's office.[35] The minister for defense confirmed the proposal and ordered the formation of the committees in November.[36]

The infantry and anti-aircraft committee began work that December, and produced a list of the weapons systems it was to evaluate. Anti-tank guns were on the initial list of sixteen systems to be evaluated, and in fifth place on the list of thirteen systems the com-

[30] Kronlund, *Suomen puolustuslaitos 1918–1939*, 263.

[31] Tynkkynen, *Hyökkäyksestä puolustukseen*, 51.

[32] "Koskee: pysyväisen elimen aikaansaamista jv:n aseistuksen kehittämiseksi." In Yleisesikunta. Jalkaväentarkastaja. 21 Salainen ja henkilökohtainen kirjeenvaihto (1934-1934). T-17814/10. Finnish National Archive.

[33] *Ibid*.

[34] Puolustusrevisioni R-632/2 Mietintö Osat I ja II 1926, 12.

[35] "Koskee: tyyppitoimikuntien asettamista." In Yleisesikunta. Järjestelytoimisto (toimisto VIII). 1 Salainen kirjeenvaihto (1934-1934). T-20690/1. Finnish National Archive.

[36] Ministry of Defense, K.D.N:o 183/35.K.sal. In Yleisesikunta. Järjestelytoimisto (toimisto VIII). 1 Salainen kirjeenvaihto (1934-1934). T-20690/1. Finnish National Archive.

Picture 4. Famed designer Aimo Lahti's L-39 anti-tank rifle only entered widespread service in the Continuation War, when it was no longer powerful enough to penetrate the armor on Soviet tanks. SA-kuva CC BY 4.0.

mittee intended to perform firing trials with.[37] Given that the committee only had three permanent members, all of whom were employed elsewhere, the workload placed on it seems entirely disproportionate. The sense of urgency displayed in some of the military journal articles on anti-tank defenses had clearly not translated into action, since anti-tank weapons were buried in the long lists of weapons systems to be evaluated by the committee.

The committee, however, acted quickly. Before the end of 1935 they had submitted an initial report, calling for the acquisition of two anti-tank weapon systems: an anti-tank gun and a lighter anti-tank rifle or machine gun. For the gun, the committee recommended either a German or Swedish 37mm gun, then the state of the art.[38] Discussions on the lighter system stretched into August 1939, when at last the 20mm L-39 anti-tank rifle, designed by Aimo Lahti, was selected and an order was placed.[39]

The light anti-tank system became a casualty of the army's chaotic procurement system; when there were several competing options available, the army simply could not decide on a weapon system. In addition to underestimating the armored threat, the *Jäger* officers in

[37] Jv. ja kev. it. Asetyyppitoimikunta, 7/35. "Koskee: toimikunnan työohjelmaa." In Yleisesikunta. Järjestelytoimisto (toimisto VIII). 1 Salainen kirjeenvaihto (1934-1934). T-20690/1, Finnish National Archive.

[38] Liimatta, *Ulkomaisista esikuvista kohti omaperäisempiä ratkaisuja*, 183–184.

[39] Liimatta, *Ulkomaisista esikuvista kohti omaperäisempiä ratkaisuja*, 186–190.

charge of the army had failed to establish robust procedures for evaluating tactical needs and technical developments. In the case of the anti-tank gun, settling on a 37mm gun was easier as there were not many competitive alternatives. Actually getting the guns was a different matter.

National industrial policy

The general chaos of the Finnish state administration in the 1920's and 30's was not limited to the armed forces, and offered Finnish industry plentiful opportunities for rent-seeking. In the 1930's, rent-seeking was coupled to a desire to create a self-sufficient national defense industry to ensure wartime supply. The Federation of Finnish Industries (*Teollisuusliitto*) was successful in lobbying the state to introduce a rule demanding that defense contracts be given to domestic companies, even if their products were 20% more expensive than an international competitor's.[40]

When Finland was a Grand Duchy of the Russian Empire, local industries had produced some war materiel for the Imperial Russian Army. During the First World War, production had mostly consisted of artillery shell casings and fuse components. No native ammunition or artillery production existed.[41] A pioneer of Finnish artillery production was the Tampere Flax and Iron Works (*Tampella*), which started manufacturing 81mm mortars for the army in 1933.[42] A year later, Tampella and Bofors were making plans to co-operate on producing artillery for the army.[43]

The Finnish state, however, was having difficulties deciding how it wanted its artillery produced. At first, the Ministry of Defense was opposed to foreign-licensed production, as they believed this restricted the army's freedom to select its weapons systems. There had been talk of starting domestic artillery production since the early 1920's, but to no result. From 1935 onward, a number of committees discussed whether artillery should be produced by state-owned or private companies, or bought from foreign suppliers. While the army wanted to establish a state-owned artillery factory, the Finnish metal industry association (*Suomen Metalliteollisuusyhdistys*) campaigned against this. The industry association was also opposed to co-operation with Bofors.[44]

In early 1936, a scheme for artillery production was proposed by the war economics department of the Defense Ministry. The state would found a small artillery plant, which would account for a third of the production. The rest would be produced by a corporation owned half and half by domestic metal industry and Bofors or Swedish investors. This was designed in part to create deeper Swedish economic interests in Finland for strategic reasons.[45] The metal industry association strongly opposed the corporation building its own

[40] Jari Eloranta. Rent seeking and collusion in the military allocation decisions of Finland, Sweden, and Great Britain, 1920–38. *Economic History Review*, 62, 1 (2009), pp. 23–44, 27–28.

[41] Jukka Jokinen, *Tykki taipui paperikoneeksi. From Field-gun to Paper Machine. Valmet Rautpohja 1938–1988*. Valmet Paperikoneet Oy, 1988., 18.

[42] Toivonen, Vesa. *Tampellasta Patriaan. 70 vuotta suomalaista raskasta aseenvalmistusta.* Apali, Tampere, 2003., 13.

[43] Toivonen, *Tampellasta Patriaan*, 57; Jokinen, *Tykki taipui paperikoneeksi*, 20.

[44] Jokinen, *Tykki taipui paperikoneeksi*, 19–26.

[45] Jokinen, *Tykki taipui paperikoneeksi*, 22–24.

plant, as they feared it would begin competing with them after the defense acquisitions were finished.[46] In practice, the corporation would have had a near monopoly on Finnish artillery acquisitions; in the Metal industry association's scheme, foreign and state production would have been minimized, leaving the corporation free to distribute contracts to its members and maximize rent-seeking.

When the corporation idea was suggested to Bofors, they were not interested in participating. The scheme then fell through, but a change of government delayed decisions until December 1936, when the cabinet proposed the establishment of the State Artillery Factory (*Valtion tykkitehdas, VTT*) in Jyväskylä. A license agreement was signed with Bofors in January 1937.[47] The state factory started operations in Jyväskylä in 1938, and in that year the army ordered 50 37mm anti-tank guns.[48] Since VTT could not produce more, another 100 guns were ordered from Tampella. The two plants shared some sub-contractors, most notably Crichton-Vulcan, but they did not co-ordinate their efforts at all, both producing their own equipment. A strike at Crichton-Vulcan in 1939 further delayed production.[49]

The Finnish armored corps also became embroiled in these plans. In 1936, to modernize the armored corps, the Finnish army ordered 33 Vickers 6-ton tanks from the United Kingdom, but without gunsights or guns.[50] Two years later, in 1938, the army ordered 37mm tank guns based on the Bofors anti-tank gun from VTT. The optics were to have been ordered from Germany, but the outbreak of the Winter War scuttled these plans, and temporary Finnish replacements had to be produced. The tank guns were only completed in 1940.[51] This is how Finnish industrial policy led to the armored corps entering the Winter War with unarmed tanks.

Tampella delivered the first 37mm anti-tank guns to the army in October 1939. A total of 48 guns were produced during 1939, and the initial order of 100 guns was finished by the end of the first quarter of 1940.[52] VTT also delivered its order of 50, eventually 56, 37mm anti-tank guns during the Winter War.[53] In other words, while the defense revision committee of 1926 had recommended placing an order of 197 guns for the infantry, this number of pieces wasn't reached during the entire Winter War. While Tampella had been in talks with Bofors about joint production in 1934, the unsuccesful Finnish-Swedish corporation scheme saw production delayed until 1939.

[46] Mika Skippari. *Kotimaisuus kunniaan. Suomen Metalliteollisuusyhdistyksen painostustoiminta julkisen valinnan teorian pohjalta vuosina 1928–1938.* Master's thesis, University of Jyväskylä, 1999., 101.

[47] Jokinen, *Tykki taipui paperikoneeksi*, 24–27.

[48] Jokinen, *Tykki taipui paperikoneeksi*, 38.

[49] Toivonen, *Tampellasta Patriaan*,59–61.

[50] Liimatta, *Ulkomaisista esikuvista kohti omaperäisempiä ratkaisuja*, 181.

[51] Jokinen, *Tykki taipui paperikoneeksi*, 38, 41–44.

[52] Toivonen, *Tampellasta Patriaan*, 61.

[53] Jokinen, *Tykki taipui paperikoneeksi*, 38.

Conclusions

Although the acquisition of infantry guns with anti-tank capabilities had been discussed as early as 1920, and the decision to procure Bofors 37mm anti-tank guns was made in 1935, the Finnish Army faced the first Soviet offensive of 1939 almost entirely without modern anti-tank weapons. Why did the Finnish army enter the Second World War with such a deficient anti-tank capacity?

The original sin of the Finnish army's failure to acquire anti-tank armament was the Jäger mutiny of 1924. The German-trained Jägers were successful in marginalizing and driving out the Russian-trained officers with the technical knowledge to understand armored warfare. During the Jäger supremacy, two principal problems inhibited the development of an anti-tank capacity: the Jägers' faith in the impassability of Finnish forests to tanks, and the lack of any functional formal mechanisms for procurement. Even after the Jäger supremacy receded and the need for anti-tank weapons was understood, the chaotic state of the procurement system delayed the army's ability to acquire light anti-tank weapons for years.

Even though the decision to procure Bofors 37mm anti-tank guns was made relatively quickly, the actual production of the weapons was delayed for years by national industrial policy. Over a year was spent creating a corporation that would have maximized rent-seeking by the Finnish metal industry, but that required co-operation with Bofors or other Swedish investors, who were never interested in the project at all. Instead of ordering the

Picture 5. Finnish anti-tank weaponry remained eclectic well into the Continuation War. Pictured is a French 25mm Hotchkiss anti-tank gun. Some of these weapons were bought directly from France, and subsequent examples were purchased from the German Army, who had captured them during their invasion of France. SA-kuva CC BY 4.0.

bulk of the guns from Bofors or Tampella, the decision was made to build a government artillery plant, that eventually lacked the capacity to complete either the anti-tank or tank gun orders, and delayed the whole process so much that the guns were barely in production in 1939 when the Winter War started.

Obviously the people making these decisions could not have known that a world war would start in 1939. It is still striking that even though the Finnish Army's complete lack of anti-tank defenses was identified as a serious issue by 1934 and openly discussed in military journals, no sense of urgency seems to have penetrated into the committees in charge of remedying it. Even if the procurement process is not judged by the criteria of the Winter War, but rather by the army's own conception of its anti-tank needs, it must be considered a failure.

In general, the example of procuring Finnish anti-tank weapons shows that weapons procurement can be a very long process, involving not only military expediency but questions of military culture and doctrine, as well as foreign policy, strategy and national industrial policy. Finland's failure to acquire sufficient anti-tank weapons was primarily a failure of doctrine, but even when that failure was corrected, the coupling of procurement to industrial policy delayed the process by years. Further research into Finnish military culture and the interaction between the military and industry, not only in terms of procurement and industrial policy but also into the networks of people connecting the two, would no doubt advance our understanding of many other questions relating to Finnish military history.

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Bibliography

Archival sources

Mietintö Osat I ja II, Puolustusrevisioni R-632/2 1926, Finnish National Archive.

Mietintö Osat III ja IV, Puolustusrevisioni R-632/3 1926, Finnish National Archive.

Yleisesikunta. Jalkaväentarkastaja. 21 Salainen ja henkilökohtainen kirjeenvaihto (1934-1934), T-17814/10, Finnish National Archive.

Yleisesikunta. Järjestelytoimisto (toimisto VIII). 1 Salainen kirjeenvaihto (1934-1934). T-20690/1, Finnish National Archive.

Yleisesikunta. Koulutustoimisto (toimisto X). 14 Salainen kirjeenvaihto (1934-1934). T-17645/10, Finnish National Archive.

Published sources

Hanell, Edvard. Maasto meillä ja Keski-Euroopassa; vertailuja taktillisessa suhteessa. Suomen Sotilasaikakauslehti 1929, s. 337-351.

Sana ja Miekka 19/1924, Metsät ja maanpuolustus.

Newspaper and magazine articles

"Homemade tank bombs." *Popular Science*, June 1941.

"How the Molotov Cocktail Got Its Name." *New York Times*, Nov. 20 1986.

Online sources

The Oxford Essential Dictionary of the U.S. Military. Oxford University Press, 2002 online version, accessed 15.5.2019.

Academic articles

Eloranta, Jari. Rent seeking and collusion in the military allocation decisions of Finland, Sweden, and Great Britain, 1920–38. *Economic History Review*, 62, 1 (2009), pp. 23–44.

Halila, Michael. "Suomen armeija ja kansalaissodan pitkä varjo: Jääkärien sotataito 1918–1939". *Historiallinen Aikakauskirja* 116, no. 2 (2018): 167–180.

Halila, Michael. "Metsä taistelumaastona. Arvostellaanko meillä sitä oikein?" Suomen armeijan metsäsuhde ja metsätaistelun kehittäminen 1918-1939. *Vuosilusto* 12 (2018): 38–50.

Kier, Elizabeth. Culture and Military Doctrine: France between the Wars. *International Security*, Vol. 19, No. 4 (1995): 65–93.

Palokangas, Markku Suomen panssarintorjunnan tykkiaseistus. *Sotahistoriallinen aikakauskirja* 17, 1998.

Peltonen, Matti. Between Landscape and Language. The Finnish National Self-Image in Transition. *Scandinavian Journal of History*, vol. 25, no. 4 (2000): 265–280.

Literature

Halila, Michael. *"Onko hyökkäysvaunuilla mitään tulevaisuutta meillä?" Suomalainen panssariajattelu ja puolustusvoimien maastokäsitys 1919–1939*. Master's thesis, University of Helsinki, 2015.

Jokinen, Jukka. *Tykki taipui paperikoneeksi. From Field-gun to Paper Machine. Valmet Rautpohja 1938–1988*. Valmet Paperikoneet Oy, 1988.

Kronlund, Jarl. *Suomen puolustuslaitos 1918–1939. Puolustusvoimien rauhan ajan historia*. WSOY, 1988.

Käkelä, Erkki. *Marskin panssarintuhoojat. Suomen panssarintorjunnan kehitys ja panssariyhtymän panssariyksiköiden historia*. WSOY, 2000.

Laaksonen, Lasse. *Mistä sotakenraalit tulivat. Tie Mannerheimin johtoon 1918–1939*. Helsinki-kirjat, 2011.

Hannu Liimatta. *Ulkomaisista esikuvista kohti omaperäisempiä ratkaisuja. Itsenäisen Suomen jalkaväkitaktiikan kehittämisen neljä ensimmäistä vuosikymmentä.* Maanpuolustuskorkeakoulu, Helsinki 2018.

Jouni Sillanmäki. *Voiton vaunut. Renault Modèle 1917 ja niiden käyttö Suomessa*. Panssarimuseon julkaisu n:o 4, 2012.

Mika Skippari. *Kotimaisuus kunniaan. Suomen Metalliteollisuusyhdistyksen painostustoiminta julkisen valinnan teorian pohjalta vuosina 1928–1938*. Master's thesis, University of Jyväskylä, 1999.

Toivonen, Vesa. *Tampellasta Patriaan. 70 vuotta suomalaista raskasta aseenvalmistusta*. Apali, Tampere, 2003.

Vesa Tynkkynen. *Hyökkäyksestä puolustukseen. Taktiikan kehittymisen ensimmäiset vuosikymmenet Suomessa*. Maanpuolustuskorkeakoulu, taktiikan laitos, julkaisusarja 1, 1/1996.