

Chemistry and History

# Chemistry and Politics: Edvard Immanuel Hjelt (1855–1921)

**GEORGE B. KAUFFMAN**

Department of Chemistry  
California State University, Fresno  
Fresno, CA 93740  
[george\\_kauffman@csufresno.edu](mailto:george_kauffman@csufresno.edu)

**LAURI NIINISTÖ**

Laboratory of Inorganic and Analytical Chemistry  
Department of Chemical Technology, Helsinki  
University of Technology, FIN-02015 Espoo, Finland  
[Lauri.Niinistö@hut.fi](mailto:Lauri.Niinistö@hut.fi)

*...he also played  
a prominent role  
in politics, held a  
post now  
corresponding to  
Prime  
Minister....*

**C**hemists who have made important contributions to politics, although a rare breed, date from the very inception of our science. Antoine-Laurent Lavoisier (1743–1794), the founder of modern chemistry, spent most of his time working as a financier, economist, accountant, banker, treasurer, academician, statistician,

---

In this section we present articles by leading scientific historians that chronicle the important events, persons, and publications that make up the rich history of chemical science. The history of chemistry, of course, has taken place against the background of world history, and the articles in this section often make that very clear. Chemists and their research are always influenced by current events. These articles are intended to describe the setting in which important discoveries occurred and to humanize their discoverers.

—Clifford LeMaster, Editor in Chief

landowner, civil servant, educator, and liberal administrator deeply involved in political, economic, and social reform. In fact, it was Lavoisier's position as a former member of the *Ferme généralé*, the French monarchy's tax-collecting agency that led directly to his trial, conviction, and guillotining by the Revolutionary Tribunal.

The examples of the first and fourth Presidents of Israel—Chaim Weizmann [1] and Ephraim Katzir, respectively, also spring readily to mind. Organic chemist Marcellin Berthelot (1827–1907) was French Senator for Life (1881–1907), Minister of Education (1886–1887), and Secretary of State (1895–1896). If one considers electrical experiments and theories and inventions such as the lightning rod and pulse glass for boiling water under reduced pressure to be physical chemistry, then American statesman Benjamin Franklin (1706–1790) certainly qualifies. And, if we consider his discussion of the principle of conservation of energy in his *Essai sur les machines en général* (1783) to underlie thermodynamics, the father of Nicolas Leonard Sadi Carnot (1796–1832), Lazare Nicolas Marguerite Carnot (1753–1823), who was prominent in political and military spheres and called the “organisateur de la victoire” because of his activities under the First Republic of France, also qualifies. Other lesser-known chemists who have chosen political careers include Britain's longest-serving Prime Minister since 1827, Oxford-educated Margaret Thatcher (1979–1990), Italian Foreign Minister Gianni Demichelis (1989–1992), Dr. Boris Frlec, current Foreign Minister of Slovenia (1990–), Endel Lippmaa, who has served as a minister in Estonia in three separate governments and is now a member of the Estonian parliament, Evdokia Maneva, Environmental Minister of Bulgaria, and Jerzy Buzek of the Solidarity party, who was recently chosen Prime Minister of Poland (1997–). In Finland Henrik Ramsay, who obtained his doctorate in 1909 under Emil Fischer in Berlin, served as Finnish Foreign Minister (1943–1944).

Ramsay's fellow countryman and contemporary, Edvard Immanuel Hjelt (1855–1921) (Figure 1) [2, pp 66–83; 3–10], Professor of Chemistry at the University of Helsinki, who was Rector of the University and “performed greater services to the University than anyone since its founding” by Per Brahe in 1640 during the reign of Queen Christina of Sweden [2, p 83; 3b; 11; 12], was a member of this class of chemist-statesmen who deserves greater recognition from his fellow chemists.

An exceptionally gifted, dedicated, and multifaceted individual, Hjelt was not only a chemist, historian of chemistry, and textbook writer best remembered—when he is

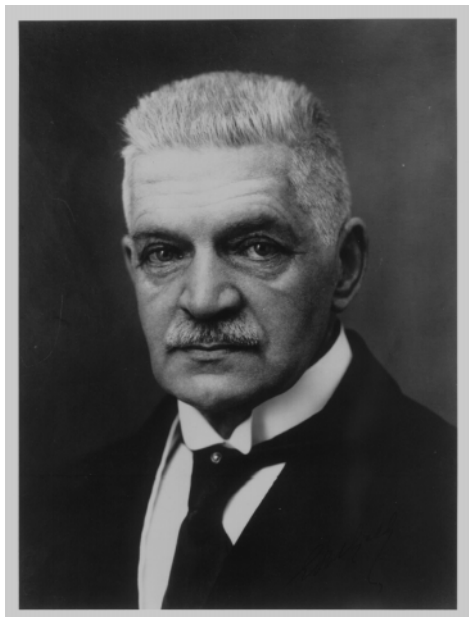


FIGURE 1. EDVARD IMMANUEL HJELT (1855–1921).

remembered at all—for his book on the history of organic chemistry [13], but he also played a prominent role in politics, held a post now corresponding to Prime Minister, and participated actively in the struggle for Finnish independence, following which he became Finnish Ambassador to Germany. Inasmuch as we have discussed Hjelt's personal life and career as a chemist and historian of chemistry elsewhere [14], we limit ourselves here to considering his political contributions to national and international affairs.

### University Rector [2, 3b, 8]

During the period 1888–1896 Hjelt was appointed auditor of the university's accounts for the years 1887–1895, and the conscientious manner in which he carried out these duties and his concomitant knowledge of university finances won him the confidence of his colleagues. In 1896 they elected him Vice-Rector (1896–1899) and in 1899 Rector (1899–1902). It is a tribute to Hjelt's will power and self-control that he was able to discharge these duties, let alone carry out research on the history of chemistry, during this time of conflict.

Although Czar Alexander I (1777–1825) had made Finland an autonomous grand duchy, one of his successors, Czar Nicholas II (1868–1918), in a manifesto of

February 15, 1899, deprived the Finnish Diet (*Lantdag*) of almost all legislative powers and changed the previous peaceful collaboration between Russia and Finland into confrontation [15]. The pressure of Pan-Slavism for a Russian expansionist policy and clashes between the great powers led to attempts to russify Finland, with, e.g., introduction of Russian postal, toll, and monetary systems.

The ultranationalistic Russian Governor-General of Finland, Nikolai Ivanovich Bobrikov (1839–1904), an outspoken enemy of the university, was granted dictatorial powers by the Czar, and he ruthlessly suppressed all opposition by use of Russian police methods and the importation of two companies of Cossacks to deal with demonstrators. For example, when rumors surfaced that a so-called *kissannaukujaiset* (“cat’s serenade,” more familiar as the German *Katzenjammer*), a traditional student demonstration at night involving mewling, whistling, and yelling to demonstrate contempt, was to be held for him, he gave orders that troops should be called in and ordered to shoot. Rather than deal with Bobrikov, however, Hjelt interacted more with Vyacheslav Konstantinovich Plehve (1846–1904), the Secretary of State for Finland and Chancellor of the university, who had written the manifesto of February 15, 1899 that began the “russification” of Finland. Although Plehve and Bobrikov were supposed to collaborate, they were actually antagonistic toward each other, and Hjelt was able to play one off against the other. He convinced Plehve that because the university was Plehve’s domain, it should be kept free of Bobrikov’s influence or else Hjelt could not prevent student disturbances and demonstrations.

Following the February 1899 manifesto, Hjelt and the university’s Vice-Chancellor Thiodolf Rein (1838–1919) signed a petition of protest that was signed by 523,000 citizens (half of the adult Finnish population) to the Czar. University students had skied from farm to farm in the vast, sparsely populated countryside to collect the signatures in slightly more than a week. A deputation of five hundred men set forth to deliver the petition personally to the Czar, who instructed the Minister of State to tell them, “I shall not receive them although I am not angry with them either.”

News of the February 1899 manifesto’s threat to Finland’s political status spread throughout the civilized world. More than a thousand scientists, writers, and artists from nine western European countries drew up a petition to the Czar titled “Pro Finlandia” (Figure 2), which an international deputation chaired by Senator J. V. L. Trarieux of France was entrusted to deliver (Figure 3), an extreme embarrassment for



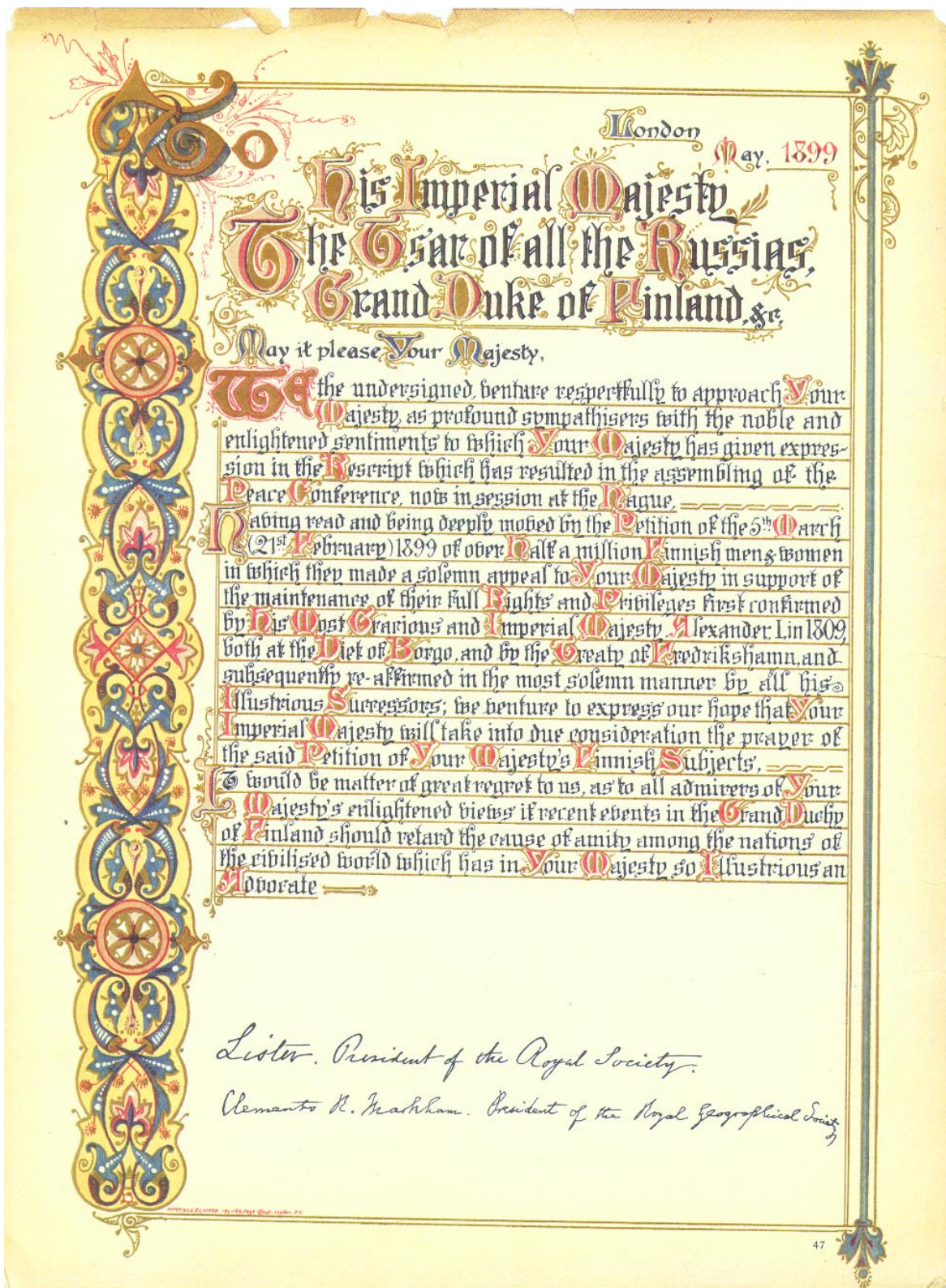
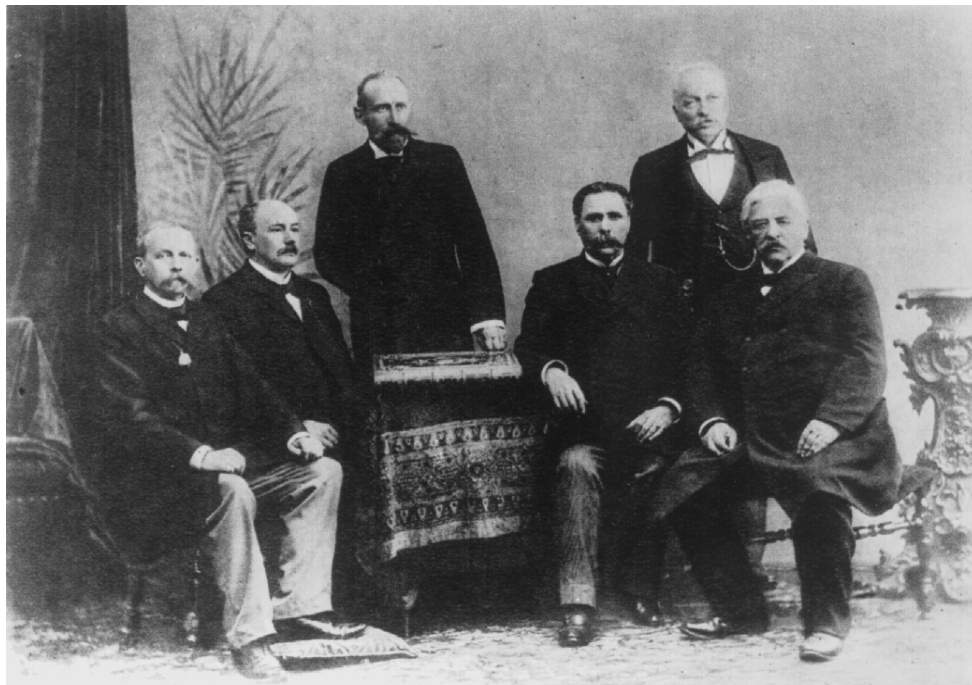


FIGURE 2. "PRO FINLANDIA" PETITION, LONDON, MAY 1899.



**FIGURE 3.** "PRO FINLANDIA" DELEGATION, 1899. FROM LEFT TO RIGHT, BRÖGGER, VAN DER VLUGT, NORMAN-HANSEN, TRARIEUX, BRUSA, AND NORDENSKIÖLD.

the Russian Court because, as a court minister admitted, "Scarcely a single famous name is missing from it." Nevertheless, after long deliberation, the Czar refused to receive the deputation. Still, this almost universal protest on behalf of Finland may have slowed the rate of russification [15].

Despite such foreign protests a military edict dissolving the Finnish national army and making it possible to conscript Finns into the Russian army was announced in July 1901. The university students were enraged, but Hjelt calmed and placated them and kept them from carrying out counterproductive demonstrations. During his tenure as Rector, Hjelt skillfully managed to pacify the students and faculty with empathy and understanding while simultaneously preventing the government authorities from taking stronger, more repressive measures. He was reelected Rector for the 1902–1905 triennium.

On April 18, 1902, the first conscription was to occur in Helsinki and caused a strike among the conscripts as well as additional strikes during the next few years. Hjelt warned the Russian authorities against excessive punishment of the student strikers, and in May 1904, by bargaining with Plehve, he succeeded in halving the time the



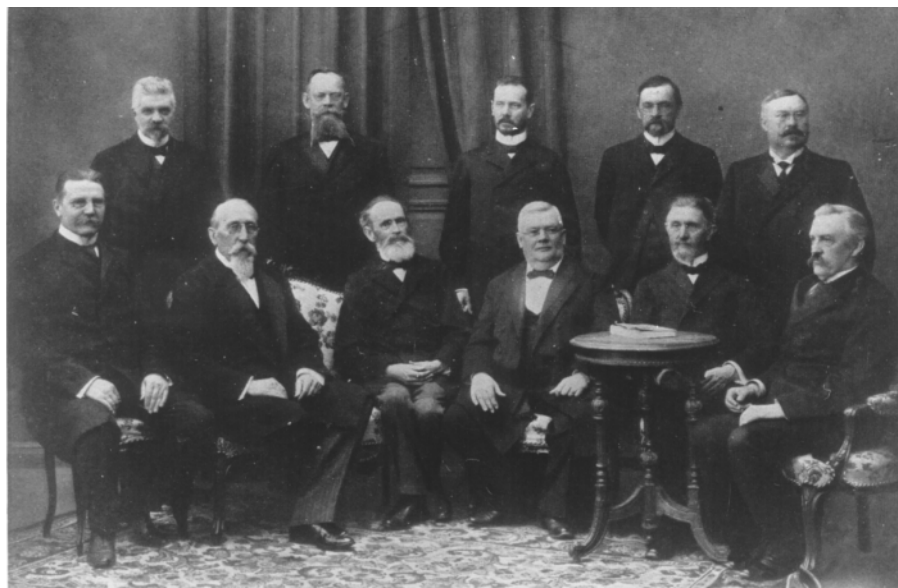
student strikers were to be suspended as well as halving the numbers of students punished. On June 16, 1904 Governor-General Bobrikov was assassinated in Helsinki by Eugen Waldemar Schauman, a local educational official, who then shot himself. Three professors were exiled, and Bobrikov was succeeded by Prince Ivan Obolensky (1856–1910), who acted more moderately than Bobrikov. On July 28, 1904 Plehve was killed in St. Petersburg by a bomb thrown by Russian revolutionaries.

The students planned to go on strike because of the deportations, but Hjelt succeeded in preventing them. At the beginning of 1905, after considerable negotiations between Hjelt and Acting Chancellor Edward Oerstroem (1862–1922), a Russian who had succeeded Plehve, the three deported professors and numerous exiles were permitted to return to Finland. During 1905 the Czar retreated both in Russia and in Finland. Russia's defeat in its war with Japan (1904–1905) and general strikes in Russia and Finland in October 1905 forced Nicholas II to guarantee civil liberties to his subjects and in November 1905 to rescind the decrees based on the February 1899 manifesto, including the governor-general's dictatorial powers.

In May 1905 Hjelt declined to be a candidate again for Rector, and Rabbe Axel Wrede (1851–1938), one of the three exiled professors, was elected in September as his successor. In December, however, Wrede became a member of the government (Senate), and on December 22 Hjelt was appointed to his third term as Rector. On December 20, 1906 Hjelt also entered the government as Assistant Head of the Board of Education. On August 1, 1908 he was appointed Vice-Chairman of the Imperial Senate's Economic Department, a position corresponding to Prime Minister (Figure 4). On May 28, 1909 he was appointed to a new second professorship of chemistry, which he held until December 23, 1910, when he was appointed the university's Vice-Chancellor.

### **World War I, Travels, and Politics [2, 3b, 8, 16]**

During his almost eighteen years as Rector and Vice-Chancellor, Hjelt was astonishingly successful in moderating and hindering the government's plans to "russify" the university. Because the university had been regarded for more than a century as "Finland's heart," the importance of Hjelt's contributions to his country cannot be overemphasized. He chronicled his eventful years as Rector, Vice-Chancellor, and Senator (1899–1917) in a book of memoirs [16].



**FIGURE 4.** ON AUGUST 1, 1908, HJELT (SECOND ROW, FIRST ON LEFT) WAS ELECTED VICE-CHAIRMAN OF THE ECONOMIC COMMITTEE OF THE SENATE, A POSITION CORRESPONDING TO PRIME MINISTER IN THE PRESENT FINNISH PARLIAMENTARY SYSTEM.

---

Hjelt found Germany to be very congenial for his writing, and he usually spent his summer vacations there. After World War I broke out, Hjelt returned to Helsinki in September 1914. The new russification program of November 1914 convinced him that Finland had no future within the Russian Empire and that its liberation would best be accomplished through Russia's defeat by Germany. In 1915 Germany, in whose interest it was to cut off Finland from the Czarist Empire or at least to force Russia to deploy troops in Finland, thus making them unavailable elsewhere, had promised to give military training to Finnish volunteers. Two thousand men, including students who were encouraged by Hjelt, managed to cross the border into Sweden and from there make their way to Germany where they formed an entire battalion. These members of the 27th Prussian Light-Infantry Battalion were called *Jaegers* (Hunters), and they later formed the core of an army of liberation for Finland. In February 1915 Hjelt joined an "Elders' Council" for the Finnish independence movement, and during the summer he met abroad with various German officials, an activity regarded by the Russians as high treason, which resulted in his being questioned by a Russian magistrate.

After the March 1917 Russian Revolution and Czar Nicholas II's abdication (March 15, 1917), Hjelt accompanied other Finnish political delegates to Petrograd



(The Germanic name St. Petersburg had been changed to its Russian form after the war's outbreak) and obtained a manifesto restoring autonomy to Finland from the precarious Russian interim government. In August and November 1917 Hjelt traveled to Sweden and Germany, respectively, as a representative of the Finnish liberation movement. On November 26, 1917 he and Finnish delegate, Baron Adolf von Bonsdorff (1862–1928), were called to the German army headquarters at Kreuznach to meet with General Erich Ludendorff (1865–1937), who with Marshal Paul von Hindenburg (1847–1934) was directing the German war effort (Figure 5). Hjelt suggested that Finland secede from the Russian Empire to form an independent country closely allied with Germany, which should send troops to Finland to provoke a Finnish uprising. Ludendorff requested that Finland declare itself independent as soon as possible, and he promised to furnish German arms.

### **Finnish Independence [2, 3b, 8, 16–18]**

On December 4, 1917 the Finnish Senate proclaimed Finland an independent republic, a proclamation ratified by the Diet on December 6. The Senate then received recognition of independence from the Bolshevik Party in Russia, which had come to power in November 1917 followed by recognition from Sweden. In January 1918 Hjelt was appointed Finnish Minister in Berlin, where he obtained recognition for the new republic from Germany. France, Denmark, and Norway followed suit within a few days. From Berlin Hjelt was sent to Vienna and The Hague and received recognition from Austria and the Netherlands, respectively.

The accession to power of the Bolsheviks in Russia aggravated a split in the political sympathies of the new republic, and Finland's war for independence developed into a short but bloody civil war, which began on January 26–27, 1918 when radical Finnish socialists occupied government buildings in Helsinki. In this war the Red Guards (pro-Bolshevik Finns aided by Russian soldiers) fought against the White Guards (bourgeois Civil Guards representing the legitimate government). Hjelt chronicled the conflict and his role in it in his book *Finland's Independence, From Dream to Reality* [17]. Upon the outbreak of war Hjelt arranged in Berlin for arms for the Finnish *Jaeger* Battalion, which formed the core of the White army of the Finnish general, Baron Carl Gustav Mannerheim (1867–1951), who later served as Finland's president (1944–1946).



**FIGURE 5.** ADOLF FRIEDRICH, DUKE OF MECKLENBURG (1873–1969), HJELT’S CANDIDATE FOR THE FINNISH THRONE.

---

On February 14, 1918, in response to a telegram from General Ludendorff, Hjelt in Berlin, together with International Law Professor Rafael Waldemar Erich (1879–1946) in Helsinki, urgently appealed for help to the German government and military headquarters. On February 21 at German field headquarters Ludendorff revealed to Hjelt and a Finnish major the plans for landing a German force in Finland. Hjelt also had dinner with Ludendorff and witnessed a visit by Kaiser Wilhelm II (1859–1941). On April 3 six German battalions landed at Hanko (Swedish: Hangö), about 80 miles west of Helsinki, followed by three battalions east of Helsinki, an action brought about almost completely by Hjelt’s efforts. Mannerheim launched an offensive and occupied the Red Guard center of Tampere (Swedish: Tammerfors), about 100 miles northwest of Helsinki. By April 14 Helsinki, which had been occupied by the Reds, was liberated by the Germans and White volunteers, and by early May the war had been won. In Hjelt’s words, Finland’s freedom and independence could “never have been won without Germany’s support and help” [17].

On March 7 Hjelt concluded a peace treaty between Finland and Germany, which increased German influence in Finland. The latter treaty was superseded by the

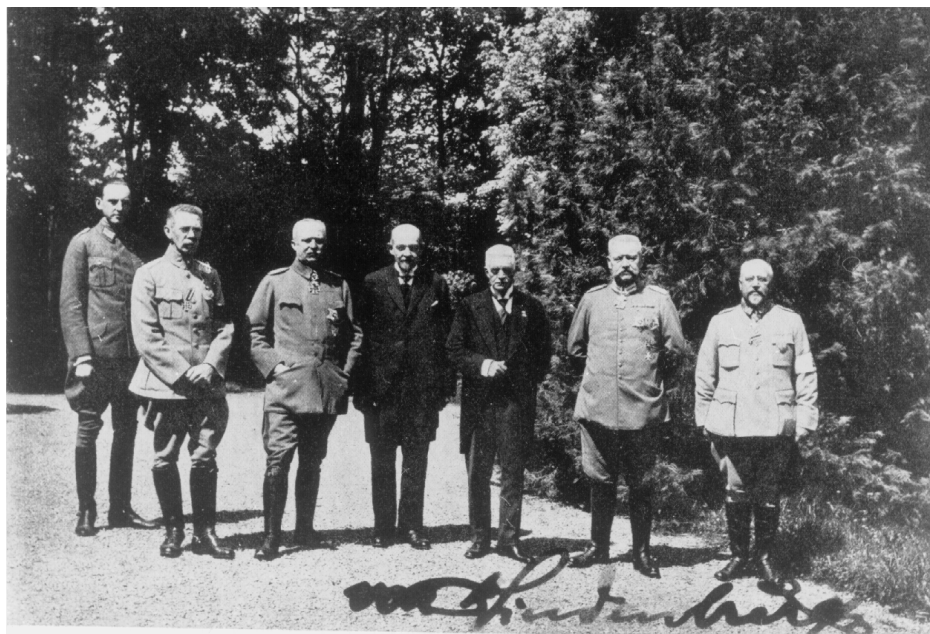


**FIGURE 6.** FRIEDRICH KARL, PRINCE OF HESSE (1868–1940), KING OF FINLAND, WHO NEVER ASSUMED THE THRONE.

---

armistice that ended World War I on November 11, 1918. Later Hjelt was criticized for summoning the German expeditionary force originally on his own initiative and for signing a treaty which gave Germany an almost monopolistic position in Finnish foreign trade, although for only a very limited time. These two questions were interconnected, however, because Germany demanded concessions for their military intervention.

During the summer of 1918, after the Diet had decided to make Finland a monarchy, Hjelt was involved in the selection of a king. His candidate was Adolf Friedrich, Duke of Mecklenburg-Schwerin (1873–1969) (Figure 5), who had helped the Finnish *Jaeger* Battalion in Germany during 1915. The duke was known as an able and liberal administrator, who had served as a governor of the German West African colony of Togo, which became a French colony in 1918. After the German government declined the candidacy of all Prussian princes, Friedrich Karl, Prince of Hesse (1868–1940) (Figure 6), whose consort was the Kaiser's sister and Queen Victoria of England's granddaughter, was elected the first and only king of an independent Finland after a close vote of the Finnish Parliament on October 9, 1918. The victorious Allied powers



**FIGURE 7.** IN JULY 1918 HJELT VISITED KAISER WILHELM II AT HIS HEADQUARTERS IN SPA, BELGIUM. IN CONNECTION WITH THIS VISIT HJELT AND THE FINNISH DELEGATION, CONSISTING OF MAJOR BARON BERTEL JOHAN SEBASTIAN GRIPENBERG (1878–1947), GENERAL HANNES IGNATIUS (1871–1941), AND DR. ADOLF VON BONSDORFF (1862–1928), VISITED THE GERMAN ARMY HEADQUARTERS IN AVESNES, FRANCE WHERE THEY MET THE GERMAN MILITARY LEADERS FIELD MARSHAL PAUL VON HINDENBURG (1847–1934) AND GENERAL ERICH LUDENDORFF (1865–1937). THIS OFFICIAL PHOTOGRAPH, AUTOGRAPHED BY VON HINDENBURG, SHOWS FROM LEFT TO RIGHT: COUNT KRELVI REX (GERMAN LIAISON OFFICER), GRIPENBERG, LUDENDORFF, VON BONSDORFF, HJELT, VON HINDENBURG, AND IGNATIUS.

opposed his candidacy, however, and he abdicated without setting foot in Finland. In 1919 Dr. Kaarlo Juho Ståhlberg (1865–1952), a lawyer and devoted parliamentarian, became the first president of Finland.

In July 1918 Hjelt had an audience with the Kaiser and conferred Finnish decorations on the Kaiser, Hindenburg, and Ludendorff at the German army headquarters at Avesnes (Figure 7). After the German revolution, Hjelt helped Ludendorff escape from Germany, an action for which he was reproached by his government and by Mannerheim, the new acting head of Finland.

In contrast to his negative attitude toward France, Hjelt's attitude toward Germany was a warm and positive one. He had received a very favorable impression of Germany and Germans during his first stay abroad (1875) as a 20-year-old student at the Technische Hochschule in Dresden. He possessed a nearly full command of the German language (He even taught it in a Helsinki high school), whereas he seldom had an opportunity of



practicing French. Politically he viewed Germany as a counterbalance to Russia, with whom France was establishing close political and military ties at the end of the nineteenth century. His Germanophilism and Francophobia reduced his effectiveness as a postwar diplomat, and, after taking three months' leave, he was dismissed from the Finnish diplomatic service in May 1919.

After his recall to Helsinki, Hjelt was appointed Acting Chancellor of the University of Helsinki. When not occupied with administrative duties, he edited his memoirs. Spending his summers in Germany, he suffered a burst gall bladder resulting in peritonitis at Bad Mergentheim in Württemberg where he had gone for his health. Following surgery, he died of heart failure at the age of sixty-six on July 2, 1921.

## Conclusion

Edward Hjelt was a man of multiple careers. First, he devoted himself to pure science and contributed to the development of the newly evolved main stream of chemistry in the latter half of the nineteenth century, namely, the study of naturally occurring and synthetic organic molecules. Then, when working as an able and devoted administrator at the university, the russification pressure from St Petersburg led him deep into political life. His ultimate political goal, as narrated in his last book [17], was to see Finland as an independent country among the other nations of Europe. His sometimes controversial activities in Germany should be viewed against this background. During his entire political and administrative career he was a devoted and diligent historian of science; his *magnum opus* [13] was the first comprehensive history of organic chemistry. It is not surprising that his last, uncompleted manuscript, *Die Schulen der organischen Chemie im 19. Jahrhundert* (The Schools of Organic Chemistry in the 19th Century, 1921), also dealt with the history of the organic chemistry that he so cherished.

Hjelt's bookplate of 1903 (Figure 8) symbolizes the two sides of his activities. On one hand, he was a strong defender of the law and the rights of the university against Russian oppression, and, on the other, he was a contemplative scientist and historian of chemistry. According to Finnish historian of science Robert Tigerstedt [5, p 22]:

Edvard Hjelt was a man of whom our country can with good reason be proud, a man whose memory, even in distant future days, will be preserved in grateful recollection.

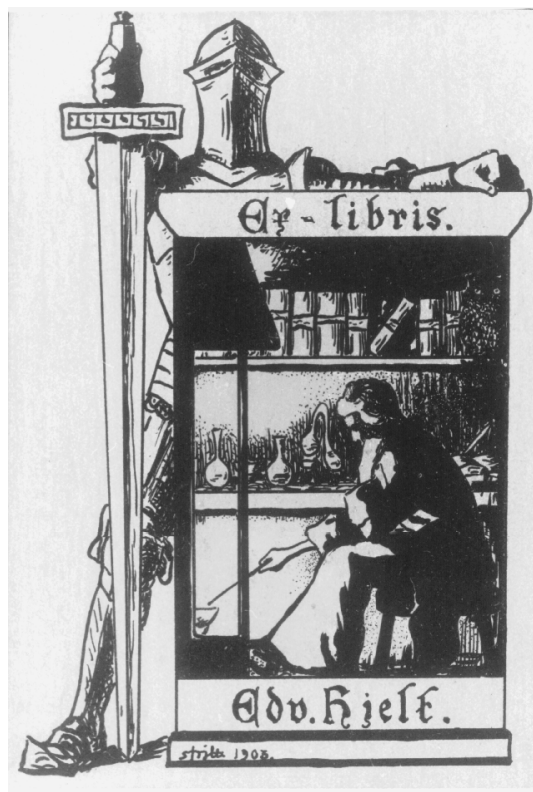


FIGURE 8. HJELT'S BOOKPLATE (1903).

---

## ACKNOWLEDGEMENT

The authors acknowledge the assistance of Dr. Jussi Niinistö for his critical reading of the manuscript and of Professor Pekka Pyykkö, University of Helsinki, and Diane Majors, California State University, Fresno Library, for providing valuable source materials.

---

## REFERENCES

1. Kauffman, G. B.; Mayo, I. *The World & I* **1992**, 7(11), 262; *J. Chem. Educ.* **1994**, 71, 209; *Yedi'on: Kimiya, Tekhnologya ve-hevra* **1994**, 59/60, 40 (in Hebrew).
2. Enkvist, T. *The History of Chemistry in Finland 1828-1918: With Chapters on the Political, Economic and Industrial Background*; Societas Scientiarum Fennica: Helsinki, 1972 (163 pp.).
3. Aschan, O. (a) *Finska Kemists. Medd.* **1921**, 30, 58 (in Swedish); (b) *Ber.* **1922**, 55A, 163 (in German, transl. from Swedish); (c) *Minnestal över Edvard Immanuel Hjelt hållet vid Finska Vetenskaps-Societetens års- och högtidsdag den 29 April 1922*; Söderström: Helsinki, 1922 (36 pp.) (in Swedish).

4. Harries, C. *Ber.* **1921**, 54A, 189.
5. Tigerstedt, R. *Edvard Hjelt*; Söderström: Helsinki, 1921 (22 pp.) (in Finnish).
6. Carpelan, T.; Tudeer, L. O. T. *Helsingin Yliopisto: Opettajat ja Virkamiehet: Vuodesta 1828*; Söderström: Helsinki, 1925; Vol. I; pp. 354–359 (in Finnish).
7. Ojala, V.; Schierz, E. R. *J. Chem. Educ.* **1937**, 14, 161.
8. Hjelt–Cajanus, E. *Edvard Hjelt och Sekelskiftets Finland*; Söderström: Helsinki, 1953 (363 pp. + appendix) (in Swedish). This biography was written by Hjelt's oldest child, Esther, an artist and author, who married Karl Werner Cajanus (1878–1919), a forester and onetime *Finnish chargé d'affaires* in Copenhagen.
9. Qvist, W. *Finska Kemists Medd.* **1956**, 65(1), 1 (in Swedish).
10. Kauffman, G. B. *Kemia–Kemi* **1991**, 18, 1010 (in Finnish).
11. Riekkola, M.–L. *Chemistry at the University of Helsinki*; University of Helsinki: Helsinki, 1991 (21 pp.).
12. Klinge, M. *Eine nordische Universität: Die Universität Helsinki 1640–1990*; Kustannusosakeyhtiö Otava (Otava Verlag): Helsinki, 1992 (800 pp.). This is an abridged version of the Finnish original, *Helsingin yliopisto 1640–1990 I–III*, Kustannusosakeyhtiö Otava: Helsinki, 1987–1990 (740 + 931 + 783 pp.), published in Swedish translation as *Helsingfors Universitet 1640–1990 I–III*; Otava: Helsinki, 1988–1990.
13. Hjelt, E. *Geschichte der organischen Chemie von ältester Zeit bis zur Gegenwart*; Vieweg: Braunschweig, 1916 (xii + 556 pp.).
14. Kauffman, G. B.; Niinistö, L. *Chem. Educator* **1998**, 3(3): S1430-4171(98) 03208-5. Avail. URL: <http://journals.springer-ny.com/chedr>.
15. Jutikkala, E.; Pirinen, K. *A History of Finland*, 3rd ed.; Heinemann: London, 1979 (253 pp. + index).
16. Hjelt, E. *Från händelserika år I: Upplevelser och minnen: Från verksamheten vid universitetet och senaten under ofärdsåren; Från händelserika år II: Upplevelser och minnen: Från krigsåren och vistelser i Tyskland*; Söderström: Helsinki, 1920 (312 pp.) and 1919 (252 pp.) (in Swedish).
17. Hjelt, E. *Itsenäinen Suomi, unelmasta todellisuuteen*; Tietosanakirja–osakeyhtiö: Helsinki, 1921 (in Finnish); *Finlands självständighet, från dröm till verklighet*; Söderström: Helsinki, 1921 (166 pp.) (in Swedish).
18. Paasivirta, J. *Suomi vuonna 1918 (Finland in the Year 1918)*; Werner Söderström: Porvoo, 1957 (383 pp.) (in Finnish).