

A TRIBUTE TO THE MEMORY OF

J. SIGFRID EDSTRÖM
(1870–1964)

PRESENTED AT THE 2004 ANNUAL MEETING
OF THE ROYAL SWEDISH ACADEMY OF ENGINEERING SCIENCES

BY JAN HULT

The Royal Swedish Academy of Engineering Sciences (IVA) is an independent learned society that promotes the engineering and economic sciences and the development of industry for the benefit of Swedish society. In cooperation with the business and academic communities, the Academy initiates and proposes measures designed to strengthen Sweden's industrial skills base and competitiveness.

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PREFACE

Every year since 1997, the Royal Swedish Academy of Engineering Sciences (IVA) has produced a booklet commemorating a person whose scientific, engineering, economic or industrial achievements were of significant benefit to the society of his or her day. The Commemorative Booklet is published in conjunction with the Academy's Annual Meeting.

This year's tribute is devoted to J. Sigfrid Edström (1870–1964) for his outstanding contributions to Swedish industry and its various organizations.

After graduating from the Chalmers Engineering School, Edström continued his studies at the Eidgenössisches Polytechnikum (now Eidgenössische Technische Hochschule, ETH) in Switzerland, and then worked in the USA. In 1900, he was appointed Manager of Gothenburg Tramways and directed the conversion from horse-drawn carriages to electric trams. He was appointed Managing Director of ASEA in 1903, where he reorganized the company and launched a determined export drive. He was in charge of ASEA for no less than thirty years between 1903 and 1933, and was Chairman of the Board for a further fifteen years between 1934 and 1949. When Edström joined ASEA, the company had 1,100 employees, but when he retired, the company had a total manpower of 10,200 in 43 countries.

For almost half a century, Edström played a central role in Swedish industry and was one of the founders of the Federation of Swedish Industries (and also its Chairman for some time). As Chairman of the Swedish Employers' Confederation between 1931 and 1942, he was one of the signatories of the Saltsjöbaden Agreement. Edström was also one of the founders of the

Swedish Industrial Institute for Economic and Social Research (IUI), the Swedish Electrical Manufacturers' Association, and the International Chamber of Commerce.

Edström – who had been a good sprinter and set the Scandinavian 150-metre record of 16.4 seconds in 1891 – assumed a leading position in Swedish and international sports. He was a member of the organizing committee for the 1912 Olympics in Stockholm, and was a member of the International Olympic Committee (IOC) for no less than 32 years between 1920 and 1952, and its Chairman during the last six years between 1946 and 1952.

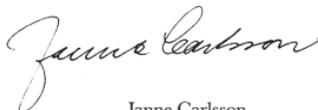
J. Sigfrid Edström was a distinguished personality in Swedish industry and its various organizations. The Royal Swedish Academy of Engineering Sciences – of which he was a member since 1925 – now wishes to pay him tribute in the 2004 Commemorative Booklet.

We wish to extend our sincere thanks to Jan Hult, the author and Professor Emeritus in Applied Mechanics at the Chalmers University of Technology, for the extensive and involved work he devoted to this year's Commemorative Booklet.

Stockholm, 29 October 2004



Lena Torell
President of the Academy



Janne Carlsson
Chairman of the Medals Committee

CONTENTS

INTRODUCTION 6

THE ENGINEER 7

THE INDUSTRIAL LEADER 14

THE INSTITUTION FOUNDER 20

THE SPORTS PROMOTER 24

IN CONCLUSION 26

AUTHOR'S NOTE 26

REFERENCES 27

INTRODUCTION

J. Sigfrid Edström is totally unknown to today's young generation, since engineers usually merit little interest in schools and among the media. But the tramway carriages in the city of Gothenburg can serve as a good reminder of him. On one of them, his name is featured at the bottom of the bows, on the starboard side.

This is a special way of commemorating a number of persons associated with the city of Gothenburg, such as Elfrida Andrée, Gunnar Gren, Sonya Hedenbratt and Evert Taube. But



A tram in Gothenburg, 2004. (Courtesy of the Gothenburg Traffic and Public Transport Authority)

why an engineer and why just Sigfrid Edström?

His life coincided with a dramatic period in the history of Sweden. Large parts of the country suffered a famine the year before he was born, after the worst failure of crops in living memory. When he died 94 years later, the general welfare in Sweden was higher than in any other country. A destitute Sweden on the northern fringes of Europe had become a modern industrial society.

The work of Sigfrid Edström as engineer, industrialist, institution founder and sports promoter has given him a unique place in our history.

THE ENGINEER

Johannes Sigfrid Edström was born on 21 November 1870 in a village on Mollösunds Tänge in Morlanda parish on the island of Orust. His parents were Master Mariner Olof Martin Edström and his wife Eva Charlotta. When the family later moved to Gothenburg, Sigfrid was enrolled in the Majorna five-year secondary school.

Towards the end of the 1840s, the Chalmers Engineering School began facing problems in the recruitment of students with adequate basic knowledge. The school set up a preparatory course to which the 16-year-old Sigfrid Edström enrolled. He got on well and was later moved to the higher course from which he graduated in 1891.

*Sigfrid Edström's parents
Olof Martin and Eva Charlotta Edström.
(K.A. Bratt, Ed., J. Sigfrid Edström: En levnads-
teckning (A biography), Part I, Stockholm 1950)*



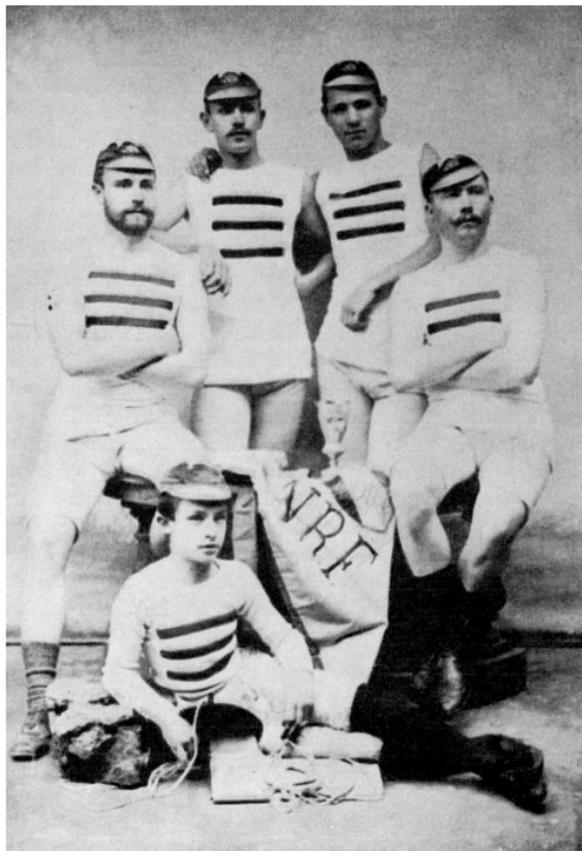


*J. Sigfrid Edström as a Chalmers student in 1890.
(J. Sigfrid Edström, *Minnen ur mitt liv (Recollections from my life)*, Ystad 1959)*

One of his teachers was August Wijkander, Principal of Chalmers, who was to play a decisive role in the life of Sigfrid Edström. He had studied in Lund and became Doctor of Philosophy in Physics before taking up the post of headmaster of the Chalmers School in 1881. His lectures dealt principally with the science of electricity, which was a new subject that prompted Edström to continue to a higher stage after graduation. On the recommendation of Wijkander, Edström was granted a royal scholarship for further studies at Eidgenössisches Polytechnikum in Zürich, which was then Europe's leading technical university.

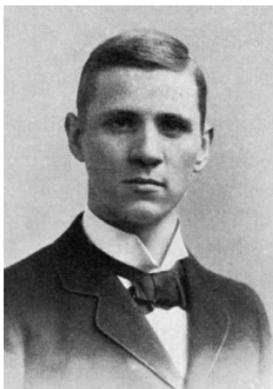
He received advanced instruction in both mechanical and electrical engineering, but Edström also found time to foster his interest in sports. The year he graduated at Chalmers, he also set a Scandinavian record of 16.4 seconds in 150-metre sprint. Four Scandinavian students had previously formed the "Nordic Rowing Association" in Zürich, and he became an active member. This interest in sports later promoted a unique career alongside his industrial career.

After graduating at Polytechnikum in 1893, Sigfrid Edström returned to Sweden and Gothenburg. But just as they are now, young engineers were attracted to the United States, and after returning home, he immediately wrote to one of his former colleagues from



Zürich who was then working at the Westinghouse Electrical Manufacturing Co. in Pittsburgh, Pennsylvania, to find out about the work prospects there. He received a positive reply, but with the proviso that he should first improve his English. So on his way to the United States, he stopped over in Scotland for a month.

The rowing team from the "Nordic Rowing Association", Zürich 1892. Edström is second from the right. (K.A. Bratt, Ed., J. Sigfrid Edström: En levnadsteckning (A biography), Part I, Stockholm 1950)



J. Sigfrid Edström, Engineer, Pittsburgh 1895. (J. Sigfrid Edström, Minnen ur mitt liv (Recollections from my life), Ystad 1959)

In Pittsburgh, he was first taken on to do general design work. Since he did this with flying colours, he was afforded the privilege of working directly under George Westinghouse, the founder of the company. Westinghouse was continually in search of new ideas for innovations, and one of these was an electric motor drive for trams. Westinghouse assigned Edström to develop a tram carriage that would be supplied with electric power from the ground instead of from an overhead power line, which was then considered to be a blot on the cityscape.

While pursuing this work, Edström was kept locked in a secret room, probably to make sure that General Electric – the competitor company owned by Thomas Alva Edison – would not find out what was in the offing. But the task was not easy, and in the “Minnen ur mitt liv” (Recollections from my life) memoirs published 66 years later, he declared that “I was never an inventor, so I did not succeed in solving the problem”. After warning Westinghouse of the dangers of contact lines running in the ground, he was returned to the earlier drawing office and workshops, and to more fruitful work.

In the spring of 1896, he began casting around for something else to do, but he felt overstrained and decided to use the summer to pay a visit to his parents, who now lived in the northern part of the Gothenburg archipelago. He travelled back to the USA through

London, and on the “Etruria” Atlantic steamer, he met Ruth Miriam Randall from Chicago, who later became his wife.

In the summer of the same year, the USA suffered a grave economic crisis, and it took Edström six months to find a new post, now as designer at the General Electric Co. in Schenectady, New York State. The Swedish engineers at Schenectady included two brothers, Ernst and Eskil Berg, who introduced Edström to Charles Proteus Steinmetz, one of the legendary pioneers in electrical engineering.

Edström found out from his friends in Zürich that the city was looking for engineers with electric motor experience for the city’s tramways. The aim was to replace the old horse-drawn carriages with more modern electrically powered trams. This attracted him and he submitted an application. Several of his lecturers at the Polytechnikum recommended him for the post, and he looked forward with great expectations to revisiting the city.

But before doing that, he had an errand in Chicago. He went there and proposed to Ruth Randall. She accepted, but the wedding had to be postponed for a while. He first wanted to show his mettle to the people in Zürich.

In the early days, he was on a learning curve. Instead of doing design work in an industrial company, he now had to come to grips with organization and work management in a large city. He admittedly received guidance from Tramways Manager Schenker, who seldom moved out of his office and entrusted Edström with the task of dealing with everything involving visiting workplaces, concluding agreements and drawing up various contracts.

In his engineering education at Chalmers and at Polytechnikum, Edström had never



*The newly-wed Ruth and Sigfrid Edström. Zürich 1899. (J. Sigfrid Edström, *Minnen ur mitt liv (Recollections from my life)*, Ystad 1959)*

dealt with such matters. He recalled this at a later date when, in 1929, he was invited to lecture at the centenary celebrations of Chalmers. He emphasized there that the modern engineering profession more often consisted of organizing the working conditions in industrial environments rather than designing new machines.

This experience gradually began influencing the curricula at technical universities in Sweden. Courses in industrial economics and organization are currently among the most sought-after.

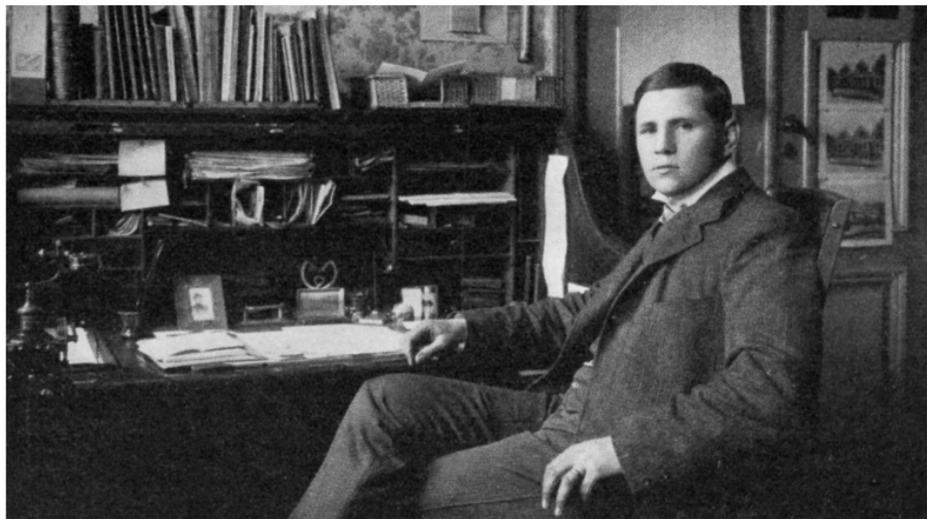
The work of electrifying the tramway network in Zürich progressed on schedule. Early in June 1899, Edström had reason to visit the USA on business, and took the opportunity to

marry Ruth Randall at her home in Chicago. The honeymoon journey to Zürich passed through Gothenburg, to which they unexpectedly returned the year after.

The Gothenburg Tramways Management Board, under the leadership of its chairman, Professor Wijkander, decided on modernization by replacing the horse-drawn carriages with electric motor-driven carriages. Wijkander again came to influence the career of his former

student. Sigfrid Edström was offered the post of Tramways Manager. His experience from Zürich obviously made him well suited for taking on the task, and the first electric tram carriage in Gothenburg was taken into service less than two years later.

Thirteen Swedish cities built electric tramways during the first decade of the 20th century, and Edström was often retained by them as adviser.



The young Gothenburg Tramways Director in his office, 1902. (J. Sigfrid Edström, Minnen ur mitt liv (Recollections from my life), Ystad 1959)

THE INDUSTRIAL LEADER

In December 1902, Sigfrid Edström received an unexpected visit at his Gothenburg office from Marcus Wallenberg of Stockholms Enskilda Bank and Oscar Lamm, an engineer at Nya AB Atlas. He wrote briefly about this in his memoirs: “I was surprised by the visit, since it had no special objective”. But the explanation came soon after, when Wallenberg invited him to visit Stockholm. The 32-year-old Sigfrid Edström was then offered the post of Managing Director of the Allmänna Svenska Elektriska Aktiebolaget (ASEA) engineering company in Västerås. The company faced very serious economic difficulties. Speculation and creative bookkeeping had driven the company to the brink of ruin. Edström was unable to decide immediately, and wanted to begin by consulting his friends, most of whom advised him against taking up the post. But Wallenberg made a new attempt, went to Gothenburg and finally succeeded in persuading Edström, who proved to be a shrewd negotiator.

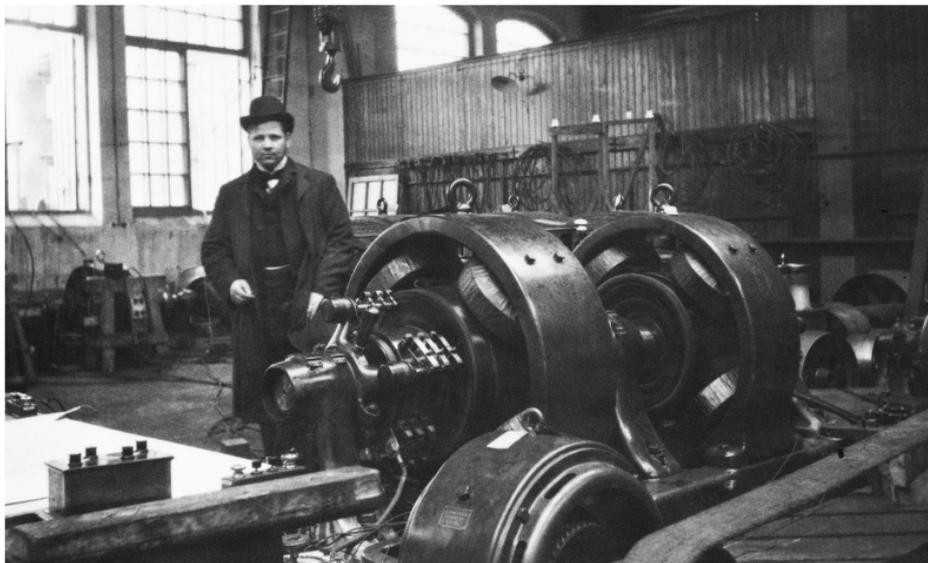
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The contract drawn up stated that Edström would be appointed Managing Director of ASEA for a period of five years, and he would be guaranteed damages of SEK 100,000 if the company were to go into liquidation during that period.

However, this clause never had to be invoked. Edström remained Managing Director of ASEA for 30 years, and then stayed on as Chairman of the Board for a further 15 years.



Before his first visit to Gothenburg, Wallenberg had presumably delved carefully into Edström's background and particularly his competence in the field of electrical engineering. At Polytechnikum in Zürich, Edström had first acquired fundamental scientific knowledge. During the succeeding five years at Westinghouse and General Electric, he had gained invaluable industrial experience.



ASEA's Managing Director visiting a test room (Från Wenström till Amtrak (From Wenström to Amtrak), published by ASEA in 1983)

At that time, the two corporate giants were involved in an occasionally very acrimonious debate concerning the advantages and disadvantages of direct current versus alternating current. The standard-bearers were Edison for direct current and George Westinghouse for alternating current. Having been employed first in one camp and then in the other, Sigfrid Edström brought unique engineering experience back to Sweden. He was the right man for ASEA in that critical situation and he soon succeeded in reversing the company's fortunes.

The history of Swedish technology records several such examples of how the knowledge of “returning sons” has served as the key to industrial successes. Edström immediately focused his efforts on rationalizing production at ASEA in line with the American methods and by mass production of a limited number of standardized products. He appointed Emil Lundqvist – a friend from his days at Chalmers and subsequently one of his colleagues at Westinghouse – as Production Manager. After only a year, Edström steered ASEA back to profitability. Lundqvist later moved to the forest industry and eventually became Managing Director at Stora Kopparbergs Bergslags AB in Falun.

The Trollhätte hydro power station – the first in a series of government investments in large-scale electricity generation – was commissioned in 1910. ASEA delivered the generators and other equipment. This type of close cooperation between the Swedish State Power Board and a private industrial company (ASEA) was analyzed in a doctoral treatise at the Royal Institute of Technology by Mats Fridlund entitled “The mutual development” (1999).

Other similar examples include development cooperation between the Swedish State Railways and ASEA (new electric locomotives), between the National Swedish Telecom-

munications Administration and Ericsson (telephone exchanges and mobile telephony), and between the Defence Materiel Administration and Saab (the Viggen and JAS fighter aircraft projects). The strength of these “development couples” lay in the creation of a long-term relationship between a manufacturing industrial company and a state purchaser with responsibility for a large technical system (electric power grid, transport network, telephone network and air defence). Fridlund described this cooperation involving joint development of new technical systems as “a specific Swedish virtuosi art”.

The success achieved on the Trollhätte power plant led to the exploitation of Stora Lule River (Porjus power station in 1914) and Dalälven River (Älvkarleby power station in 1915). When Edström left his post of Chairman of the Board of ASEA in 1949, a further twelve major power stations had been taken into service.



Under the leadership of Sigfrid Edström, ASEA grew by acquiring a number of companies in various fields of technology, such as turbine manufacturer Svenska Turbin AB Ljungström (STAL) of Finspång in 1916, electrical equipment manufacturer Nya Förenade Elektriska AB of Ludvika in 1916, the Surahammars bruk steelworks in 1916, Liljeholmens Kabelfabrik (cables) of Stockholm in 1916, electrical equipment manufacturer Luth & Roséns Elektriska AB of Stockholm in 1930, ventilation equipment manufacturer Svenska Fläktfabriken of Jönköping in 1933, and electric cooker manufacturer Elektriska AB Helios of Stockholm in 1936.



J. Sigfrid Edström's favourite picture. (Jan Glete, ASEA under hundra år 1883–1983 (ASEA over a century, 1883–1983), published by ASEA in 1983)

An early profiling field at ASEA was the development of a technique for long-distance transmission of electrical energy in the form of three-phase high voltage alternating current transmission lines from the hydro power stations in northern Sweden and elsewhere to consumers in other parts of the country. The new high voltage direct current (HVDC) technique developed later, principally by Uno Lamm, enabled electrical energy to be transmitted by submarine cables, and ASEA became a world leader in this field.

A consistent feature within the ASEA Group under the leadership of Edström was a strong focus on exports, up to 1914 mainly to Great Britain, Spain, Denmark, Finland and Russia. When Edström left his post of Managing Director in 1933, ASEA had already become an international conglomerate in electrical engineering, with more than 10,000 employees in 43 countries.



*J. Sigfrid Edström, after a portrait by Ivar Kamke, 1933.
(K.A. Bratt, Ed., J. Sigfrid Edström: en levnadsteckning
(A Biography). Part II, Stockholm 1953)*

THE INSTITUTION FOUNDER

His position at ASEA – one of the country's most important engineering groups – made it virtually imperative for Sigfrid Edström to become involved at an early stage in the *Association of Swedish Engineering Industries* that was founded in 1896. He was elected to its Central Administrative Board back in 1905, and was Chairman between 1916 and 1939.

The *Aros Fair* held in Västerås in November of every year since 1907 was founded on the initiative of Edström. This is a forum where representatives of the Government, opposition parties, company managements and trade union organizations discuss technical and economic matters. Edström was Chairman between 1907 and 1943.

The strong export orientation of ASEA soon after its reorganization made it natural for Edström to be elected in 1908 to the board of the *General Export Association of Sweden* (SAE), on which he served up to 1938.

He was one of the prime movers behind the formation of the *Federation of Swedish Industries*, was a member of the Board from its founding in 1910 up to 1938, and was Chairman between 1929 and 1931.

In 1917, the *Swedish Employers' Confederation* (SAF) elected him to the Managing Board, and then also as Chairman up to 1943. It thereby fell upon him in 1938 to lead the negotiations between SAF and the Swedish Trade Union Confederation (LO) in Saltsjöbaden. He was the signatory on behalf of SAF of the resulting agreement – a historically important document.

On the initiative of Edström, the Federation of Swedish Industries jointly with SAF

formed the *Swedish Industrial Institute for Economic and Social Research (IUI)* in 1939. This is an independent institute for research into the conditions for industrial development. Edström was Chairman of IUI between 1939 and 1943.

He was Chairman in the war years of 1939 and 1940 of the *International Chamber of Commerce (ICC)* founded in Paris in 1919.



Signing of the Saltsjöbaden Agreement in 1939. Edström is second from the right in the front row. ("Vänners hyllning till J. Sigfrid Edström på 70-årsdagen" (Tribute to J. Sigfrid Edström from his friends on his 70th birthday, Almquist & Wiksells Boktryckeri, Uppsala, 1940)

For obvious reasons, the *Sweden-America Foundation* was close to his heart. The Foundation, founded in 1919, awards scholarships to young Swedish citizens for studies and education at university level in the USA and Canada. He was one of the founders, he was a member of the Board between 1919 and 1952, and was Chairman between 1932 and 1952.

He was elected to the *Royal Swedish Academy of Engineering Sciences* in 1925, was its president between 1935 and 1937, and was elected honorary member in 1937.



Axel F. Enström, Executive Director of the Royal Swedish Academy of Engineering Sciences, presenting the anniversary volume "Vänners hyllning till J. Sigfrid Edström på 70-årsdagen" (Tribute to J. Sigfrid Edström from his friends on his 70th birthday), 1940. Photo: Pressens Bild



Ruth and Sigfrid Edström with their four children on his 70th birthday in 1940. (J. Sigfrid Edström, Minnen ur mitt liv (Recollections from my life), Ystad 1959)

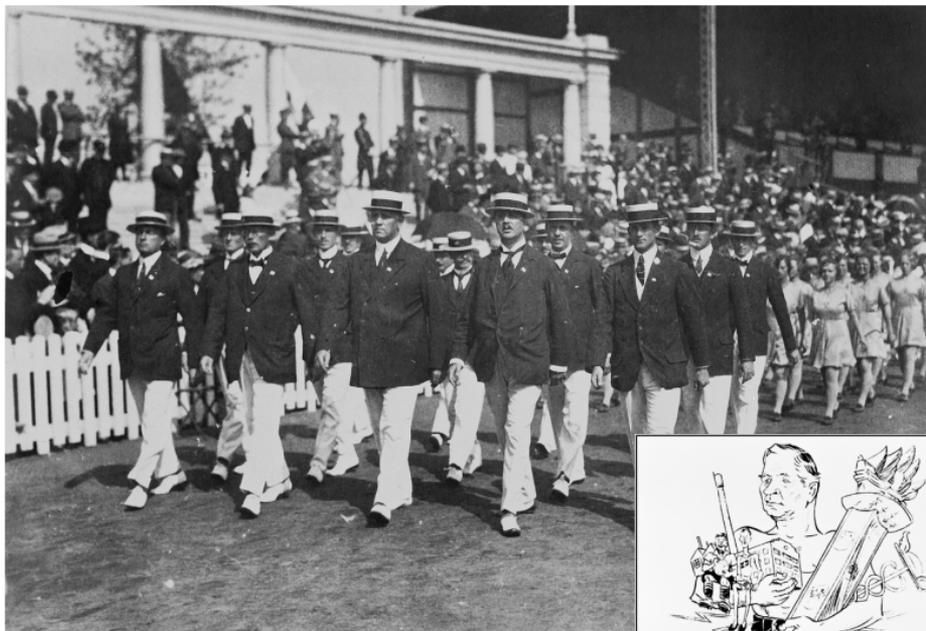
THE SPORTS PROMOTER

Active interest in sports of young Sigfrid Edström led him to keen involvement at a more mature age in both Swedish and international sports activities. Some initially regarded his side activities in this area with scepticism.

During his first year at ASEA, he participated in the founding of the *Swedish Federation of Gymnastics and Sports Associations* (1903) that became known as the *Swedish Sports Federation* (RF) in 1947. This central body of the Swedish sports activities is alone in managing the State sports appropriations. Edström was a member of the Central Administrative Board between 1903 and 1913 and Vice Chairman between 1914 and 1940.

24 He was member and Vice Chairman of the *Organizing Committee for the Olympic Games in Stockholm* in 1912. The year after, in 1913, the *International Amateur Athletic Federation* (IAAF) was formed in Berlin on his initiative. Sigfrid Edström was its Chairman between 1913 and 1946. The IAAF now has more than 170 member countries, which is more than any other international sports organization.

The pinnacle of Sigfrid Edström's path in the world of sports was his membership of the *International Olympic Committee* (IOC) between 1920 and 1952. He was elected Vice President and served between 1938 and 1946, and President between 1946 and 1952. This made his name known throughout the world, far beyond the industrial sphere.



Inauguration of the 1912 Stockholm Olympics. Edström in the centre of the front row. (Från Wenström till Amtrak (From Wenström to Amtrak), published by ASEA in 1983)



"Sigfrid the all-embracing", drawing by Nils Melander. (J. Sigfrid Edström, Minnen ur mitt liv (Recollections from my life), Ystad 1959)

IN CONCLUSION

When Sigfrid Edström passed away in 1964 at the age of 94, tributes to his memory were paid in obituaries and commemorative speeches in the press and in the various organizations in which he had been active for many years. Waldemar Borgquist, former Director General of the Swedish State Power Board drew a bright portrait of his old friend in the *Teknisk Tidskrift* periodical and concluded with the words:

“He had exceptional vitality, sound optimism, a quiet sense of humour and a happy boyishness.”

AUTHOR'S NOTE

Birgitta Hambræus of Orsa has kindly allowed me to share the personal recollections of her maternal grandfather Sigfrid, for which I am very grateful. Jan Glete at the Stockholm University, author of a comprehensive history of ASEA, has provided valuable information. Harry Frank and Lars Åke Berglund of ASEA Brown Boveri have assisted me in tracing photos in the ASEA archives.

Jan-Olof Yxell of Chalmers University of Technology has skilfully revived old photographic prints for republication. Bernt Nielsen of the Gothenburg Traffic and Public Transport Authority has kindly provided the photo of the “J. Sigfrid Edström” tram.

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