In this issue of the *Magazine*'s *Historical Corner*, we host the contribution to the conference given by Prof. Karl Grandin (Director of the Center for History of Science, Royal Swedish Academy of Sciences: Figure 3) on December 4, 2009.

As a last note, it is worth reminding readers that the Nobel Lecture given on December 11, 1909, by Guglielmo Marconi was partially investigated in a paper published few years ago in this *Magazine* (G. Pelosi, S. Selleri, and B. Valotti, "Antennae," *IEEE Antennas and Propagation Magazine*, **42**, 1, February 2000, pp. 61-63).

Figure 3. The Royal Swedish Academy of Sciences or Kungliga Vetenskapsakademin (KVA). Committees of the Academy act as selection boards for various international prizes, such as, for example, the Nobel Prizes in Physics and Chemistry.

Marconi's Nobel Prize

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The Nobel Prize is generally considered the hallmark of achievements in science, as well as in literature and peace politics. However, at the same time, the workings of the Nobel system are very little understood, and there are a lot of misunderstandings around. Here, the case of Marconi's Nobel Prize will shed some light on this issue when we study how Marconi's and others' work was evaluated by the Nobel committee.

Alfred Nobel, whose will is the basis for the Nobel Prizes, was himself an inventor, well known for the invention of dynamite, among other things. This fact, and the phrase from the will governing the physics prize – which should be awarded "to the person who shall have made the most important discovery or invention within the field of physics" – has led to some discussion on how to interpret the will. Also important is the general quote that the Prizes should be awarded to those who "during the preceding year, shall have conferred the greatest benefit on mankind." Less ambiguous than having to ponder how the previous year might be defined is the part of the will where it is stated that it is the Royal Swedish Academy of Sciences that should award this prize. These three constituents make up the whole basis of the most prestigious scientific prize. The process that followed the announcement of the will, and the negotiations and discussions that followed in order to establish the prizes took time, and are interesting in their own right [1-4]. However, here is not the place to go into that.

What caught the international attention right away with the Nobel Prize was that it was a huge amount of money that was to be awarded, and the fact that it was an *international* prize, an aspect the Swedish King at the time disliked. In the first years of existence, the prestige of the first Nobel Laureates rubbed off on the Prize, but after some time, it became the opposite.

Most of the Nobel Prizes in Physics have been awarded for discoveries rather than inventions, and this has been already debated since the beginnings of the Prize. The complaints go like this: since Nobel himself was an inventor, at least every second Prize in physics should go to an invention. The answer to this has been that Nobel gave the task to the Academy of *Science*. We *do* know that Alfred Nobel gave the task to award a *physics* prize to the Royal Swedish Academy of Sciences, of which he himself was a member. He did not give that task to the inventors' association. Over the years, arguments regarding how to interpret this passage have been made and rebutted in many different ways.

From this brief background, we can then start to look into the Nobel Prize in Physics for the year 1909, which went to Guglielmo Marconi and Karl Ferdinand Braun "in recognition of their contributions to the development of wireless telegraphy."

To understand the workings of the Nobel system, it is crucial to not only understand the statutes governing the work, but it is

also essential to know and be aware of who were the members of the respective Nobel committee. In our case, there is one main figure to be scrutinized in order to understand the Nobel Prize in Physics for 1909. His name is Gustaf Granqvist (1866-1922) (Figure 4), Professor of Physics at Uppsala University. He was appointed to the Nobel committee in 1904, and elected a member of the Academy in 1905. His specialty was the physics of the electric arc. He had made thorough investigations regarding how much of the energy in the electric arc was being transferred to heat. He was therefore naturally interested in the emerging wireless telegraphy, especially after William Duddell's work on the oscillations in circuits with electric arcs in 1900. Granqvist investigated these phenomena, and how to increase the oscillations of the Duddell arc. However, Valdemar Poulsen's invention of the arc transmitter led the development in another direction. Poulsen's design was important until vacuum tubes took over.

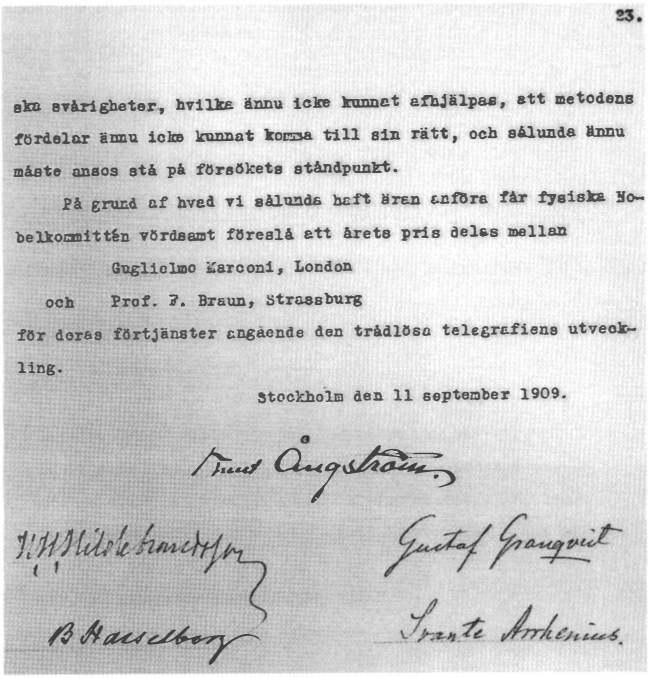
Of the five members of the Nobel committee of physics, Granqvist had thus the best expertise in wireless telegraphy. It was therefore not surprising that he was given the task to write the special report on Marconi and Braun in 1909. This was even more so, since the only nomination he ever put forward himself was the nomination for Marconi and Braun in 1909.

On January 28, 1909, Granqvist nominated Marconi and Braun; another nomination of Marconi came from Hjalmar Tallqvist in Helsinki. No other nominations for Marconi and Braun were made that year. Marconi had been nominated earlier, in 1901, 1902, 1903, and 1908, mostly by Italian physicists, and discussed by the committee. Braun had a few nominations before, in 1905-1907.

Granqvist got the approval of the other committee members, and on September 11, 1909, the Nobel Committee proposed that the Nobel Prize in Physics for 1909 should be awarded to Marconi and Braun "in recognition of their contributions to the development of wireless telegraphy." On September 22, this proposal was submitted to the physics class of the Academy, and on October 30, the physics class endorsed the proposal. Following that, the whole Academy – 74 present members – on November 11 voted for a shared Nobel Prize in Physics to go to Marconi and Braun (Figure 5).

On the day after the Academy's decision, both Marconi and Braun were reached with the news, and sent their respective thanks to the Academy by *wired* telegraphy (Figure 6)! They both

Figure 4. Gustaf Granqvist (1866-1922), Professor of Physics at Uppsala University and a key person in the Nobel committee.



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ska svårigheter, hvilka ännu icke kunnat afhjälpas, att metodens fördelar ännu icke kunnat komma till sin rätt, och sålunda ännu måste ansos stå på försökets ståndpunkt.

På grund af hvad vi sålunda haft äran anföra får fysiska Nobelkommittén vördsamt föreslå att årets pris delas mellan

Guglielmo Marconi, London

och Prof. F. Braun, Strassburg

för deras förtjänster angående den trådlösa telegrafiens utveckling.

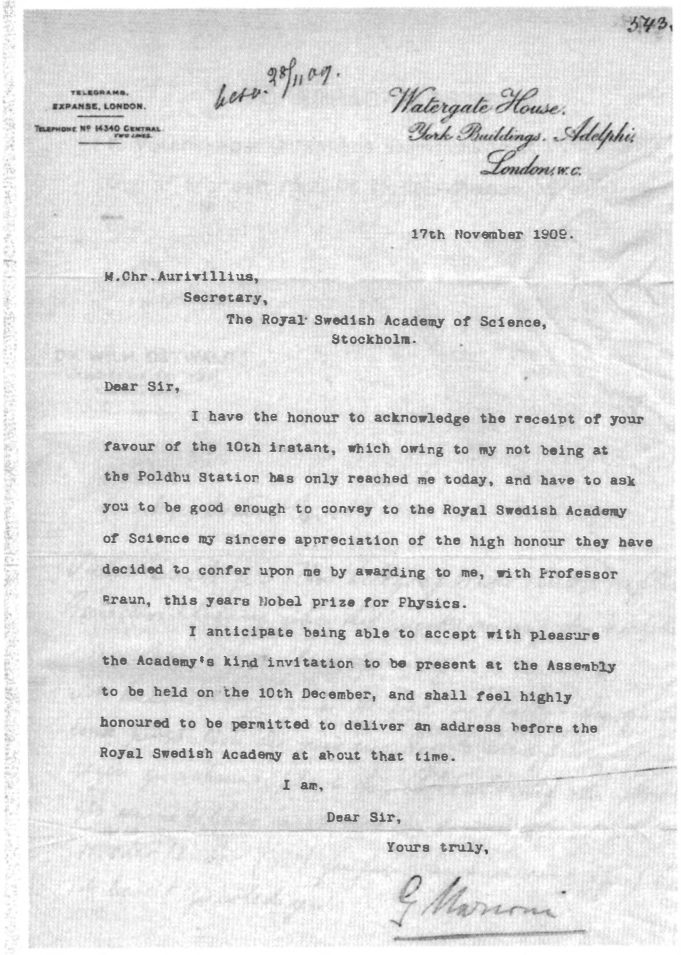
Stockholm den 11 september 1909.

Anders Ångström.

Gustaf Granqvist

Svante Arrhenius.

Figure 5. The conclusion of the Nobel committee in 1909.



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TELEGRAMS. EXPANSE, LONDON. TELEPHONE Nº 1340 CENTRAL TWO LINES.

Watergate House, York Buildings, Adelphi, London, W.C.

17th November 1909.

M.Chr.Aurivillius,
Secretary,
The Royal Swedish Academy of Science,
Stockholm.

Dear Sir,

I have the honour to acknowledge the receipt of your favour of the 10th instant, which owing to my not being at the Poldhu Station has only reached me today, and have to ask you to be good enough to convey to the Royal Swedish Academy of Science my sincere appreciation of the high honour they have decided to confer upon me by awarding to me, with Professor Braun, this years Nobel prize for Physics.

I anticipate being able to accept with pleasure the Academy's kind invitation to be present at the Assembly to be held on the 10th December, and shall feel highly honoured to be permitted to deliver an address before the Royal Swedish Academy at about that time.

I am,

Dear Sir,

Yours truly,

G. Marconi

Figure 6. Marconi's letter of thanks.

appeared in Stockholm and received their Nobel Prizes on December 10, 1909. The day after, they delivered their mandatory Nobel lectures.

Looking into the report of the Nobel committee gives the arguments for the decision. The crucial part of the contribution by Marconi was the following: "Marconi is indisputably the creator of the wireless telegraphy. His merit is not any epoch making physical discovery, but rather it is in putting it together and working it out into a practically useful system...." The corresponding section on Braun was as follows: "But it is first after the introduction of the Braunian systems that Marconi's telegraph became vigorous....Braun's work has therefore been of tremendous importance....]" This way of reasoning made it crucial that *both* Marconi and Braun were given the award together. Their contributions were portrayed as one comprehensive package. Further arguments in the report emphasized the tremendous practical importance of the creation of wireless telegraphy [5].

In the presentation speech at the award ceremony, the president of the Academy paid respect to previous theoretical and experimental work by figures like Faraday, Maxwell, and especially Hertz, leading up to Marconi, who was the one to "grasp the potentialities of the enterprise and who could overcome all the various difficulties which stood in the way of the practical realization of the idea" of transmitting wireless telegraphy.

The president of the Academy ended his speech with:

> Research workers and engineers toil unceasingly on the development of wireless telegraphy. Where this development can lead, we know not. However, with the results already achieved, telegraphy over wires has been extended by this invention in the most fortunate way. Independent of fixed conductor routes and independent of space, we can produce connections between far-distant places, over far-reaching waters and deserts. This is the magnificent practical invention, which has flowered upon one of the most brilliant scientific discovery of our time! [1]

This brief look into the background of the Nobel Prize to Marconi and Braun in 1909 has shown that their candidacies were proposed, evaluated, and argued by one committee member who had the right background and expertise to nominate, evaluate, and propose the Nobel Prize for wireless telegraphy.

References

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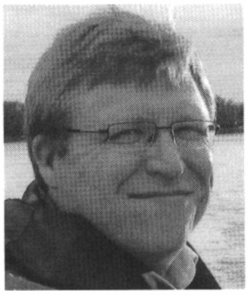
Introducing the Author



Karl Grandin was born in Uppsala, Sweden, September 30, 1965. He received an MSc from Uppsala University in Solid-State Physics in 1992. From the same university, he got a PhD in History of Science in 1999. Since then, he has been working at the Center for History of Science at the Royal Swedish Academy of Sciences in Stockholm, Sweden. Since 2008, he has been a Professor and the Director of the Center.

Prof. Grandin has worked mostly with the history of physics, especially theoretical physics and solid-state physics in the 20th century. He has been the Editor of the Nobel Foundation's yearbook, *Les Prix Nobel*, since 2006. He has also edited *A Galvanized Network: Italian-Swedish Scientific Relations from Galvani to Nobel*, with M. Beretta, 2001; *The Science-Industry Nexus: History Policy Implications*, with S. Widmalm and N. Wormbs, 2004; *Carl Peter Thunberg: Speech on the Japanese Nation*, 2007; *Aurora Torealis: Studies in the History of Science and Ideas in Honor of Tore Frängsmyr*, with M. Beretta and S. Lindqvist, 2008. He has recently published "The Rise and Fall of the Berzelius Museum," M. C. Lourenço and A. Caneiroin (eds.), *Spaces and Collections in the History of Science*, 2009, and "Nuclear Energy," *Ambio*, 2010 with P. Jagers and S. Kullander.

Prof. Grandin is a member of the Swedish History of Science Society, the Swedish Physicist Society, the History of Science Society, the Scientific Instrument Society, and the European Physical Society. He is a board member of the European Physical Society's History of Physics Group, and a member of the Energy Committee at the Royal Swedish Academy of Sciences, among other things.