



Accademia di Medicina
di Torino

GOLGI E BIZZOZERO
nel centenario della scoperta
dell'apparato reticolare interno

ESTRATTO

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CAMILLO GOLGI AND THE NOBEL PRIZE

Gunnar Grant

Department of Neuroscience, Karolinska Institutet – Stockholm, Sweden

Camillo Golgi was nominated for the Nobel Prize in Physiology or Medicine already in 1901, when the first prize was awarded. After that, his name came up every year until 1906, when he was awarded the prize, together with Ramón y Cajal. There were four proponents for Golgi that year, namely Hertwig, from Berlin, Kölliker, from Würzburg, and two Swedes, Retzius, from Stockholm, and Fürst, from Lund. Kölliker, Retzius and Fürst all proposed Golgi *and* Cajal, Retzius, however, as an alternative, Cajal alone. Cajal was proposed, in addition, by Ziehen, from Berlin, and by Emil Holmgren, from Stockholm. Kölliker had proposed Golgi already in 1901. He nominated him again in 1905, and then, as in 1906, he also proposed Cajal. Retzius sent in proposals for Golgi all the five years from 1902. The first three times, he proposed Golgi and Cajal, but in 1905 he nomina-



Figure 1. The Royal Caroline Medico-Chirurgical Institute (Kongl. Carolinska Mediko-Chirurgiska Institutet; today named just Karolinska Institutet) at Kungsholmen, close to the present Town Hall in Stockholm, around 1900. Since the mid 40s the institute is located in Solna.

ted Cajal, and after him, Golgi. Finally, as mentioned, in 1906 his suggestion was Golgi and Cajal, or Cajal alone. It may be of some interest that, in 1902, also Emil Holmgren, professor of histology at the Caroline Institute in Stockholm (Fig. 1), had been one of the proponents for Golgi, because it was him that the Nobel Committee commissioned to carry out the investigation on Golgi's work and on that of Cajal and to write the reports, all the five years from 1902.

The comprehensive report by Holmgren in 1906, corresponding to nearly 50 type-written pages of size A4 paper, was based on a careful and extensive analysis of the merits of the two candidates, who were also weighed against each other. Holmgren's conclusion was the following (translation from Swedish by G.G.): "If the achievements by Golgi, on the one hand, and Cajal, on the other, in the research on the nervous system are considered, one can not, in justice, evade the final conclusion that Cajal is far superior to Golgi". It was clear, however, that Holmgren would have given Golgi a higher priority if it had been some years earlier. Now, however, according to Holmgren, Cajal had made such important and principally valuable discoveries and also interpreted his findings in a correct way, as had been confirmed by others, that, first of all, he had to be ranked before Golgi. In favour of Cajal, Holmgren writes (translation from Swedish by G.G.): "Cajal has not served science by single corrections of observations by others, or by adding here and there an important observation to our stock of knowledge, but it is he who has built almost the whole framework of our structure of thinking, in which the less fortunately endowed forces have had to, and will still have to put in their contributions".

Regarding Golgi, Holmgren also discussed some of the findings which had turned out to be wrong. The most important of these were Golgi's adherence to the reticular theory, against which the neuron doctrine had been put forward and gained acceptance by most neuroscientists by this time, and also Golgi's view on the dendrites, which he regarded as nutritive elements for the neurons and not involved in the conduction of impulses, as well as his view on his type II cells, which he suggested to be involved in sensory function, sending axons out from the central nervous system to the periphery, on the sensory side.

Cajal's more recent contributions with his neurofibrillar impregnation method, both for a better understanding of the interior of the nerve cell and for studies of regeneration of peripheral nerve fibers, which had also been studied by Perroncito in Pavia, as well as for studies of outgrowth of axons during the embryonic development, demonstrating end bulbs (growth cones),

were also dealt with in Holmgren's evaluation, and formed part of the basis for his support for Cajal's scientific superiority.

Carl Sundberg, professor of pathology at the Caroline Institute, who was also Vice President at the Institute, was thereupon asked for another evaluation of the candidates, after Holmgren's conclusions had become known to members of the Nobel Committee. He put even more stress upon Golgi's valuable contributions than Holmgren, not only the development of the Golgi method but also, for instance, his findings of collaterals both in the gray matter and in the longitudinally running white columns of the spinal cord. He tried to soften the weak points in Golgi's contributions and quoted passages from evaluations of Golgi by Holmgren from earlier years in support of Golgi.

Before the final decision was taken, on October 25th, written opinions were expressed both by Holmgren and Sundberg, and, in addition, by Bror Gadelius, professor of psychiatry at the Caroline Institute. He supported Holmgren's views.

The final voting among the professors at the Institute resulted in a majority for a Nobel Prize shared by Golgi and Cajal. Only two were against – their names were not given, but it should not be difficult to guess who these two professors were.

Of some interest may also be Gustaf Retzius' view on the decision that was taken. This is expressed in a passage in his autobiography (1948, p. 246; translation by G.G. – italics also in the Swedish text): "... Cajal... But it is true that already at his arrival in Stockholm I thought that he had deserved receiving *a full, and undivided* Nobel Prize, and asked about this by the Nobel Council of the staff of professors at the Caroline Institute, I expressed this opinion of mine *decidedly*".

That Retzius was asked for his opinion but did not take part in the decision is explained by the fact that he was no longer a member of the Medical Faculty at the Caroline Institute. He had resigned from his chair in anatomy in 1890, in protest over the failure to get his candidate for a professorship in ophthalmology appointed. Paradoxically, however, his membership both in the Royal Swedish Academy of Sciences and in the Swedish Academy, meant that he took part in the election of the laureates both in Physics and Chemistry, and in Literature.

This was the first time that the Nobel Prize was shared between two laureates. Cajal writes about this (from the English translation of his autobiography, 1989, p. 546): "The other half was very justly adjudicated to the illustrious professor of Pavia, Camilo Golgi, the originator of the method with which I accomplished my most striking discoveries".

The ceremonies in connection with the prize:

The Prize ceremony took place in the Royal Academy of Music, on the 10th of December, the anniversary of the death of Alfred Nobel. (He died on the 10th of December, 1896 in his home in San Remo, at the age of 63). Cajal writes about this (pp. 550-551): "The ceremony of awarding the prizes was a pompous event and one of highest idealism. It took place according to the custom in the great hall of the Royal Academy of Music which was adorned for that purpose with a bust of Nobel enwreathed with flowers. Upon the presidential platform were displayed the flags and emblems of Sweden and of the nations to which the laureates belonged. His Majesty the King presided, accompanied by the Princesses and the Princes, with their brilliant suite, and there were present members of the Government, the diplomatic corps, the descendants of the Nobel family, high functionaries of the palace and of the



Figure 2. Golgi's Nobel Diploma (part 1).

army, representatives of the Swedish parliament and the civic government, professors and students of the University, and many very elegant ladies". He continues (p. 551): "As was to be expected, the discourse in praise of the laureates in Physiology and Medicine was in the hands of the illustrious Count Mörner, president of the Carolinian Institute".

Mörner's speech was given in French, and finally he turned to Golgi in Italian, and to Cajal in Spanish. The Prizes, including the diplomas were received from the hands of the King (Figure 2 shows Golgi's Nobel diploma).

The days after this ceremony, the lectures by the laureates took place. Golgi delivered his lecture the day after, on the 11th, and Cajal his lecture on the 12th. Golgi's lecture, like that of Cajal, was given in French.

The contents of Golgi's lecture came to a surprise to many of the participants. Cajal writes about this (p.552): "Contrary to what we all expected,



Figure 2. Golgi's Nobel Diploma (part II).

instead of pointing out the valuable facts which he had discovered, he attempted in it to refloat his almost forgotten theory of interstitial nerve nets”.

As pointed out by Dr. Edward G. Jones at a preceding symposium about Golgi, in Boario Terme in April this year, Golgi may have thought that there would be a “fight” at the lectures - which did not occur, however, and this might explain his presentation being polemic.

Let me end by a quotation from Retzius' autobiography (1948), where he, also, writes about the occasion when the Nobel Prize was awarded to Golgi and Cajal: (page 245; translation by G.G.): “I met Golgi several times personally at the Anatomical Congress and on the occasion of his visit to Stockholm, when, together with Cajal, he received his (half) Nobel prize. He was a noble, friendly and agreeable personality, who gained everyone's sympathies and esteem. He also behaved extremely nicely and with dignity to Cajal, although they had rather opposing views on important scientific issues, and in his official lectures in connection with the Nobel banquet in Stockholm he openly expressed these widely different views of his”.

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