

Old Intelligencer

Why Is There No Nobel Prize in Mathematics?

by Lars Gårding and
Lars Hörmander

There are Nobel prizes in physics and chemistry, so why not in mathematics? There are two current answers.

1. (French-American version) Mittag-Leffler had had an affair with Nobel's wife.

2. (Swedish version) Mittag-Leffler was the leading Swedish mathematician at the time when Nobel wrote his will. Nobel knew that if there was to be a prize in mathematics, Mittag-Leffler could use his influence in the Royal Swedish Academy of Science to become the first recipient. To avoid this, Nobel gave no prize in mathematics.

Although Nobel was a confirmed bachelor, the French-American version leads a healthy life as one of the myths of mathematics and as a recurrent subject of conversation for mathematicians who think it is unfair that physics has a prize but not mathematics. The Swedish version is an academic fabrication with no credibility. In fact, Nobel and Mittag-Leffler had almost no relation to each other. The true answer to the question is that, for natural reasons, the thought of a prize in mathematics never entered Nobel's mind.

Since the first answer above has been refuted to recently in the *Intelligencer* and since a letter in the *American Mathematical Monthly* 50 (1985), p. 502, asks for the facts of the matter we shall try to give them. Our main source is the book about the will by Ragnar Sohlman, the chief executor of Alfred Nobel's will and later the director of the Nobel foundation [1]

When Nobel died on December 10, 1896, there existed in addition to his latest will of November 27, 1895, an earlier one dated March 14, 1893. Although the earlier will was superseded by the later one, it may be relevant as a background to the stories we shall

discuss. Besides various legacies to private persons, mainly relatives, the will gave to Stockholm's Högskola (later to become the University of Stockholm), Stockholms Sjukhus and Karolinska Institutet 5% of the estate each. Österreichische Gesellschaft der Friedensfreunde was to obtain 1%, and the Royal Swedish Academy of Sciences 65% for a foundation whose income should be awarded annually "as a prize for the most important and most pioneering work in the wide domain of knowledge and progress, except in the domain of physiology and medicine. Without making it an absolute condition it is my wish that those who through writing and actions can succeed in fighting the strange prejudices which both nations and governments still have against the creation of a European peace tribunal should be specially considered".

In the final will the income from the estate, after some legacies to individual persons, was to be given annually as prizes "to those who during the past years have done mankind the greatest good. It should be divided into five parts:

One for the one who in the domain of physics has made the most important discovery or invention;

one for the one who has made the most important chemical discovery or improvement;

one for the one who has made the most important discovery in the domain of physiology or medicine;

one for the one who in literature has produced the best in ideal direction;

and for the one who has done most or best for the fraternization of peoples or abolition or diminishing of standing armies, and for creation or propagation of peace congresses . . ."

One notes that all the prizes, except perhaps that for medicine, were closely connected with Nobel's own interests. The formulations concerning the physics and chemistry prizes indicate that what Nobel had in mind was development work of the kind in which he himself had excelled. The prize for literature bears witness to his own wide literary interests, and his idealism and

friendship with Bertha von Suttner, the author of "Lay down your arms!" explain the peace prize. Mathematics was simply not one of Nobel's interests.

Sohlman has two things to say about the difference between the two wills. First, that it was fortunate that Nobel had made a firmer division between his various aims and limited his purpose, since the organization awarding the prize would otherwise have been confronted with unreasonable difficulties in a rather unrewarding task. He also remarks that it is assumed that the fact that the Stockholm's Högskola was no longer among the beneficiaries can be explained by the internal feuds which were going on at the time. The two factions were the professors, led by Mittag-Leffler, and the board of governors. The issue was the control of new appointments. The Swedish version may stem from this incident which, however, has no connection with the subjects for the prizes.

Nobel was elected member of the Swedish Academy of Sciences in 1884, and the University of Uppsala gave him an honorary degree in 1883. Apart from that, Nobel's relations with the academic world in Sweden seem to have been rather slight. Nobel, who was educated in St. Petersburg in the 1840's emigrated from Sweden in 1865 (when Mittag-Leffler was a student). After that he visited Sweden rarely, mainly an annual visit on his mother's birthday ([1], p. 25). In the mid seventies Nobel settled in Paris and lived in his large house on Avenue Malakoff. It does not seem plausible that, as stated in the *Intelligencer*, Nobel and Mittag-Leffler "must often have come into collision within the limited framework of Stockholm educated society"

During the final years of his life he did spend some time in Sweden but that was at the estate Björkborn close to the Bofors industry which he had acquired in 1903. The question of Nobel's residence turned out to be of the utmost legal importance and so it is very carefully discussed by Sohlman. Let us just mention that the French lawyer Coulet, in trying to convince a French court that Nobel was a resident of Sweden rather than France, had to resort to an argument involving the magnificent Russian horses kept by Nobel at Björkborn. Sohlman ([1], p. 315) comments that it seemed to be those horses in particular which persuaded the court and made it discuss the case.

References

1. Sohlman, R. (1950) *Ett testamente. Nobelstiftelsens tillkomstshistoria och dess grundare*. P. A. Norstedt & Söners förlag, Stockholm 1950.

Lunds Universitets Matematiska Institutum
Box 725
S-22007
Lund
SWEDEN

Three Letters from Sophus Lie to Felix Klein on Parisian Mathematics during the Early 1880's

Translated from the German by David E. Rowe

Sophus Lie and Felix Klein first met in 1869 as students in Berlin. They soon became daily companions and spent the spring of 1870 together in Paris where they met the French mathematicians Michel Chasles, Gaston Darboux, and Camille Jordan. Jordan had just published his classic *Traité des substitutions*, and the two foreigners read it avidly. Mathematics has not been the same since for it has often been said and not altogether unjustly—that from this moment on they made group theory their common property: Lie took the continuous groups and Klein those that were discontinuous. Their liaison in Paris, however, was relatively short-lived, as the Franco-Prussian War broke out forcing Klein to return to Germany, while Lie decided to set out on foot for Italy. This ill-fated idea cost him four weeks in prison, for he was arrested just outside of Paris, where guards found that he was carrying some letters written by Klein in what appeared to them to be a secret code! Lie had to wait until Darboux could set the matter straight with the authorities. He then went directly to Italy and a short time later returned to Norway.

In 1872 Lie returned to the continent and stayed with Klein in Göttingen and Erlangen, where together they discussed the key ideas that developed into the latter's Erlangen Program. After this, however, their work began to drift apart, although they continued to stay in close contact with one another. Lie was working in almost total isolation until 1884 when Klein and his Leipzig colleague Adolf Mayer sent their student, Friedrich Engel, to Norway for nine months to be his assistant. Engel ended up dedicating his life to Lie's work, first by co-authoring the three-volume *Flavor der Fuchsformationsgruppen*, and then, after Lie's death, editing his *Collected Works*. Lie's situation changed dramatically in 1886, when Klein succeeded in bringing him to Leipzig as heir to his position as Professor of Geometry, a maneuver that infuriated Weierstrass and his student H. A. Schwarz.

During his many years of isolation, however, Lie often thought about making a second trip to Paris with Klein. Over and over again this idea pops up in their correspondence, and in 1882 Lie actually took the plunge and tried to persuade Klein to join him. Unfortunately, his timing could not have been worse. Klein was in the thick of his competition with Henri Poincaré to find