No Silver Medal for Nobel Prize Contenders

Why Anesthesia Pioneers Were Nominated for but Denied the Award

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ABSTRACT

Taking the examples of the pioneers Carl Ludwig Schleich, Carl Koller, and Heinrich Braun, this article provides a first exploratory account of the history of anesthesiology and the Nobel Prize for physiology or medicine. Besides the files collected at the Nobel Archive in Sweden, which are presented here for the first time, this article is based on medical literature of the early 20th century. Using Nobel Prize nominations and Nobel committee reports as points of departure, the authors discuss why no anesthesia pioneer has received this coveted trophy. These documents offer a new perspective to explore and to better understand aspects of the history of anesthesiology in the first half of the 20th century. (Anesthesiology 2016; 125:34-8)

In November 1895, the Swedish inventor Alfred Nobel (1833 to 1896) laid the foundation for five prizes (physics, chemistry, physiology or medicine, literature, and peace) to those who had “conferred the greatest benefit to mankind.” As for the prize category physiology or medicine, it should, according to Nobel’s will, be given to a “living person who has made the most important discovery within the domain of physiology or medicine.” Candidates eligible for the award were, and still are, only those proposed by nominators who have received an official invitation from the Nobel Committee for physiology or medicine to submit one or a few names including a motivation for consideration.

In the 115 yr of Nobel Prize history, representatives of almost every branch of medicine—transplant surgery, urology, cardiology, as well as theoretical subjects such as bacteriology, genetics, reproductive medicine, immunology, and pharmaceutical research—have been honored at least once with the Nobel Prize for physiology or medicine. However, one subject, which was equally essential to the development of modern medicine, has been completely overlooked: Anesthesiology.

While inhalation anesthesia was invented in the 19th century, well before the first Nobel Prize was awarded in 1901, major improvements to this medical procedure were developed after the turn of the century, when the inventor and namesake of the famous inhalation mask, Friedrich von Esmarch (1823 to 1908), was still alive. Furthermore, several pioneers in the field of local anesthesia lived throughout the age of the Nobel Prize and therefore had the theoretical chance to become a laureate: Carl Koller (1857 to 1944), Maximilian Oberst (1849 to 1925), Paul Reclus (1847 to 1914), Alfred Einhorn (1857 to 1917), Heinrich Braun (1862 to 1934), August Bier (1861 to 1949), and Carl Ludwig Schleich (1859 to 1922). Some of them were actually nominated, even several times, and their nominations were reviewed by the Nobel Prize Committee for physiology or medicine. Why were none of them successful in the end? Did this happen just by chance? The aim of this article is to discuss these questions on the basis of sources from the Nobel Prize Committee archive in Sweden and the respective medical literature of the early 20th century. The reviews and nominations in the Nobel Archive are not available to the public for 50 yr. We reviewed the files for the years 1901 to 1950 and examined why several candidates with a background in anesthesia never succeeded in the end. With the help of our study, we hope to offer a new perspective on some aspects of the history of anesthesiology.

Background

By the middle of the 19th century, the discovery and improvements upon ether and chloroform anesthesia had revolutionized surgery with effective ways of producing unconsciousness and analgesia. The public was stunned by the glorified picture of a “magic elixir” that delivered the patient into a dream world without any pain. However, reality did not live up to hyperbole. Practice reports revealed that, while several members of staff pressed the narcotic mask on the head of the patient, the patient was sometimes frightened to death, perhaps by choking vapors or panic-induced tachycardia. Similarly painful was the awakening,
accompanied by protracted nausea, vomiting, loss of appetite, and mortal fear. There was also a risk of permanent kidney damage. Thus, some doctors criticized the induction of anesthesia as torture by sheer force.\(^5\) As a safer “alternative narcosis” to the more lethal chloroform, ether anesthesia was often accompanied by airway irritation, bronchitis, and/or severe pulmonary complications.\(^4\) Furthermore, ether narcosis was less deep and not able to induce muscle atony, a prerequisite for abdominal operations.

High Risks and Overoptimistic Results Induced the Need for Professional Anesthesia

However, the major problem was the lethal risk under both chloroform and ether narcosis. In the years 1891 to 1897, the Berlin surgeon Ernst Julius Gurlt\(^6\) (1825 to 1899) published comprehensive data about the effects of narcosis, which showed a mortality due to chloroform narcosis of 1:2,500 and due to ether narcosis of 1:8,500. But during the 1890s, a growing party of younger surgical colleagues was no longer prepared to tolerate the optimistic “autosuggestion concerning the chloroform question.”\(^2\) Gurlt’s data were challenged and criticized as overoptimistic and fabricated. Also, anesthesia should not remain a subordinate task carried out by assistants, but should become a regular part of the medical curriculum, undergoing professionalization in order to become established as a medical subject in its own right.

At the end of the 19th century, these discussions formed a basis for the intensive search for improved anesthesia methods. Two paths were pursued: first, the optimization of inhalation narcosis by using a variety of mixtures from ether, chloroform, alcohol, ethyl bromide, acetylene, etc.; second, a complete dispensation of inhalation narcosis and substitution by local anesthesia. Additionally, high hopes were raised by the sensational success achieved by the Viennese ophthalmologist Carl Koller (1857 to 1944) in experimenting with cocaine, an extract from coca leaves that had been presented by the German chemist Albert Niemann (1834 to 1861) in 1860.\(^7\)\(^8\) Koller’s report was read at the conference of the German ophthalmological society in Heidelberg on September 15, 1884.\(^9\)

Subsequently, Maximilian Oberst in Halle, Anton Wölfler (1850 to 1916) in Prague, and William Stewart Halsted (1852 to 1892) in Baltimore, together with his colleague Richard J Hall (1856 to 1897), developed different approaches to nerve block anesthesia by using highly concentrated cocaine injections in nerve trunks, inducing an interruption of nerve conductivity and anesthesia of the surrounding tissue. Within a few years, neural blockade with local anesthetics spread from ophthalmology to dentistry and general surgery, making it possible to conduct major operations.\(^10\)

Therapeutic breakthroughs are usually followed by a general anticlimax, leading to restricted indications when limitations and risks of the new method are revealed. Because of the technical limitations of local anesthesia, only cocaine solutions of 3 to 5% were able to secure stable anesthetic effects. However, these dosages led to dangerous cocaine intoxications, addiction, and even death. In due course, local anesthesia was discredited, and there were calls to return to the more reliable general anesthesia.

Anesthesia at the Fin de Siècle

In this era of uneasiness fell the annual conference of the German Society of Surgery in April 1892 in Berlin. Imagine the sheer excitement during the lecture by a 33-yr-old surgeon, Carl Ludwig Schleich, when more than 800 surgical specialists were apprised of the fact that he had developed an absolutely safe method of local anesthesia with cocaine, which would make 90% of general anesthesia unnecessary. In 1889, Schleich had set up a private practice in Berlin. His “Private Hospital for Surgery and Gynecology” proved to be a big success because he was practising the infiltration technique.

In due course, Schleich’s infiltration anesthesia was the only local anesthesia method on the market. Another pivotal breakthrough in this area was the development of conduction anesthesia by Heinrich Braun in 1897, during his time as lecturer in Leipzig. Braun’s techniques were revolutionary because the anesthetic substance was injected perineurally and, after 1902, augmented by adrenalin.\(^11\) Only a few years later, local anesthesia was revolutionized by a professor of chemistry in Munich, Alfred Einhorn, who introduced novocaine.\(^12\)\(^13\)

This was the medico-historical background of the 20th century when the newly established Nobel Prize Committee for physiology or medicine received several nominations that were aimed at honoring the revolutionary progress in surgery with the help of anesthesia.

Koller, Schleich, and Braun as Nobel Prize Candidates

While there are a few historical studies on the Nobel Prize and surgeons,\(^14\)\(^16\) little is known about the Nobel Prize candidates among anesthesia pioneers. During our search through the minutes of the Nobel Archive for scholars in this field, we found that, except for doctors such as John Collins Warren (1842 to 1927) and René Leriche (1879 to 1955), German scientists were the key figures in the first half of the 20th century. Apart from August Bier,\(^17\) whose Nobel Prize chances have already been discussed elsewhere,\(^18\) Koller, Schleich, and Braun were nominated several times over 3 decades (table 1).

The first Nobel Prize nomination we found referring to anesthesiology was written by Jacob da Silva Solis-Cohen (1838 to 1927) of Philadelphia on January 15, 1904. He put forward Koller’s “discovery of the local anesthetic power of cocaine.”\(^19\)

In 1913, the renowned Heidelberg surgeon Vinzenz Czerny (1842 to 1916) nominated Koller as well as Schleich,
Table 1. Koller, Schleich, and Braun Were Proposed by the Following Nominators for the Nobel Prize for Physiology or Medicine

<table>
<thead>
<tr>
<th>Year Awarded</th>
<th>Nominator</th>
<th>Proposed Candidate(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1904</td>
<td>Jacob Da Silva Solis Cohen (Philadelphia)</td>
<td>Koller</td>
</tr>
<tr>
<td>1908</td>
<td>Carl Pelman (Bonn)</td>
<td>Koller</td>
</tr>
<tr>
<td>1931</td>
<td>Arthur Hirschfelder (Minneapolis)</td>
<td>Koller</td>
</tr>
<tr>
<td>1937</td>
<td>Anton Eiselberg (Vienna)</td>
<td>Koller/Ferdinand Sauerbruch</td>
</tr>
<tr>
<td>1908</td>
<td>Ferdinand Hueppe (Prague)</td>
<td>Schleich/Jules Bordet/Paul Ehrlich</td>
</tr>
<tr>
<td>1913</td>
<td>Vinzenz Czerny (Heidelberg)</td>
<td>Koller/Schleich</td>
</tr>
<tr>
<td>1915</td>
<td>Gustav Killian (Berlin)</td>
<td>Schleich/August Bier</td>
</tr>
<tr>
<td>1920</td>
<td>Fedor Krause (Berlin)</td>
<td>Schleich/Antonio Grossisch/August Rollier</td>
</tr>
<tr>
<td>1920</td>
<td>Fedor Krause (Berlin)</td>
<td>Braun/Oskar Bernhard/Jaume Ferran y Clua</td>
</tr>
<tr>
<td>1930</td>
<td>Martin Kirschner (Tübingen)</td>
<td>Braun</td>
</tr>
</tbody>
</table>

reasoning that Schleich had “contributed mostly to the introduction of local anesthesia into clinical practice.”20 Czerny’s Berlin colleague Gustav Killian (1860 to 1921) nominated Schleich again a year later:

One of the most beneficial inventions of modern surgery is local anesthesia which provided endless benefit to the patients and rescued many lives. This technique has helped to overcome the limitations of surgical expertise. Therefore, I warmly recommend Cl. Schleich.21

In 1920, Schleich was nominated for the last time, with a special reference to Braun’s work:

The general application of infiltration anesthesia is due to the Professor Heinrich Braun’s method in Zwickau which substitutes cocaine by the less toxic and largely available safer novocaine. Adding adrenalin to the anesthetizing liquid has enhanced greatly the importance of the method.22

Ten years later, Braun’s method was to be nominated again for the Nobel Prize. Martin Kirschner (1879 to 1942), full professor for surgery at Tübingen University, argued:

After the introduction of ether and chloroform narcosis, the introduction of Braun’s local anesthesia into surgical practice was the biggest advancement for analgesia throughout surgical operations in the last 100 years.23

Furthermore, Kirschner wrote that Braun’s work was the prerequisite for other areas such as brain surgery. He refers to a publication by Braun,24 which explains the theoretical basis of his method. The nomination was particularly strong since it highlighted the essential criteria of the competitive discoveries within the Nobel Prize framework25: The discovery should be of theoretical and practical importance, its results should have been verified by other scientists, and it should ideally also have made the way free for new areas of research. While these criteria are characteristic for a strong candidate, Kirschner added a sentence that is not as typical. Instead of just promoting Braun, Kirschner also discredited the work of Schleich and wrote: “Without Braun’s invention, local anesthesia would have remained a primitive method as introduced by Schleich: an inefficient and uncomfortable tool for small operations which would have never been a serious threat to general anesthesia for major operations.”25

The nomination reflected the fact that Braun did not regard conductive anesthesia just as a competitive project, but as a personal challenge to Schleich. According to Braun, the presumed analgesic effect of sodium chloride, proposed by Schleich, was nothing but a phantasm that would never stand up to a review. Yet, why did none of these nominations succeed?

Reports by the Nobel Committee for Physiology and Medicine

The Nobel Prize Committee reviews the recommended candidates and their work; this practice has not been changed up to the present day. The reviews present the reviewer’s subjective view about the further development of the respective discovery and a judgment on the candidate’s impact as well as the novelty of his or her discovery. In conclusion, the reviewer gives a positive or negative recommendation as to whether the candidate deserves the prize in the current year.

At the beginning of the 20th century, the Swedish surgeon Jules Åkerman (1861 to 1951) evaluated several of his colleagues in the Nobel Prize selection procedure. His comprehensive report on Koller and Schleich was a “special investigation,” which means that both were close to success in 1913. His introduction reads like a stroll through the history of anesthesiology, from dry crocodile skin, to ether spray, up to the era of Koller/Schleich. Scientific competitors were mentioned, but according to Åkerman, the main protagonists were Reclus and Schleich because their local anesthesia was the most valuable achievement in the past 25 yr. However, a great number of other scientists were also involved in the development. Therefore, according to the Nobel Committee, it was impossible to honor just the two or three.

Five decades later, in 1967, Göran Liljestrand (1886 to 1968), secretary of the Nobel Prize Committee for physiology or medicine between 1918 and 1960, mentioned Koller’s “prizeworthiness” in retrospect:
He was several times proposed for the Nobel Prize in Physiology or Medicine. His discovery was undoubtedly prize-worthy but it was too old and had been generally accepted the same year and thus could not be considered at a time when the medical faculty tried carefully to follow the statutes in awarding the prize to older discoveries only in case their importance had been acknowledged "recently."26

A similar argument was used by Liljestrand in his evaluation of Kirschner’s 1930 nomination of Heinrich Braun. In his opinion, Braun’s work was very influential for surgery, but already very dated. He opposed Kirschner’s judgment that Braun’s work was only recognized in recent years by using quotations from a 1908 surgical textbook. Therefore, Braun was never admitted to the closer selection, and came away empty-handed just like all the other pioneers of anesthesiology.

**Discussion: Koller, Schleich, and Braun Were Nominated Several Times**

This analysis of the Nobel Prize and anesthesiology has produced some explanations as to why up to the present no anesthesiologist has ever received the Nobel Prize.

Retrospectively, the turn of the 19th to the 20th century appears from today’s perspective as an especially dynamic era for the development of modern surgery, for example, not only because of the introduction of anesthesia but also because of the concepts of asepsis and antisepsis as well as hemostasis. This is also reflected in the fact that several anesthesia pioneers were nominated for the Nobel Prize during the first decades of the 20th century. Our introductory question was why Koller, Schleich, and Braun, who made important contributions to this era, never received the Nobel Prize? The committee evaluators gave two reasons: First, the reviewers had too big a choice of candidates in anesthesiology and could not make up their mind. In other words, there were disagreements about the evaluation of scientific excellence, and it was difficult to distinguish and select the most important contribution by a single individual. Second, the committee members suggested that the crucial publications were simply too dated, and that their significance had not just recently become apparent. Moreover, competition is tough, of course, so many “prize-worthy” nominees, all of them eminent scholars in their respective fields, never receive it.

Koller and especially Schleich have to be regarded as very good runner-ups, but in contrast to the Olympic Games, there are no silver medals in the competition for the highest scientific award. Therefore, there is only hope for the future that an anesthesiologist will ever reach this holy grail of science.

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**References**


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**Competing Interests**

The authors declare no competing interests.

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Melancholic Temperamental Education for 1893 Classes by “Masters of Anaesthesia”

Flemish artist Maerten de Vos’ earthbound Melancholicus (1583) reminds us that a patient of melancholic temperament is congealed with the cold, dry “black bile” humor linked by ancient Greeks with elemental earth. By 1893 at Chicago’s Post-Graduate School of Anaesthesia (PGSA), professors were tutoring future “Master of the Science of Anaesthesia” candidates to anticipate that a melancholic patient’s anesthesia might comprise—what today’s anesthesiologists would characterize as—(1) a stormy induction, (2) a risk for reflex heart-slowing due to anesthetic underdosage (termed “syncope” by the PGSA), and (3) a smooth emergence. PGSA Professor Charles Gilbert Davis, M.D., M.S.A., taught that melancholic patients might benefit from preanesthetic calming (termed “hypnosis” by the PGSA). Surgeon-anesthetist Davis delivered his lecture “Hypnotism with Special Reference to Hypnotic Suggestion” at the World’s Psychical [Psychological] Science Congress at the 1893 Columbian Exposition. (Copyright © the American Society of Anesthesiologists, Inc.)

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