



# Excellence in orthopaedic surgery: an overview of Nobel Prize nominees 1901–1960 with focus on Friedrich Pauwels and Gerhard Küntscher

Nils Hansson<sup>1</sup>

Received: 3 July 2018 / Accepted: 31 July 2018  
© SICOT aisbl 2018

## Abstract

**Purpose** This paper provides for the first time an overview of orthopaedic surgeons nominated for the Nobel Prize in physiology or medicine during the first six decades of the twentieth century. The study is part of the project “Enacting Excellency: Nobel Prize nominations for surgeons 1901–1960”.

**Methods** The nomination letters were gathered in the archive of the Nobel Committee at the Karolinska Institute in Solna, Sweden.

**Results** Among the nominees, we find renowned scholars like Pierre Delbet, Themistocles Gluck, Gerhard Küntscher, Adolf Lorenz, Friedrich Pauwels, Leslie Rush, and Marius Smith-Petersen. The focus of the paper is on nominations for Pauwels (work on biomechanics) and Küntscher (the Küntscher nail). Both were nominated by German surgeons.

**Conclusions** Although no orthopaedic surgeon has yet received a Nobel Prize for an orthopaedic achievement, Nobel archive files can help reconstruct important trends in the field during the twentieth century.

**Keywords** Nobel Prize in physiology or medicine · Excellence in orthopaedic surgery · Adolf Lorenz · Themistocles Gluck · Friedrich Pauwels · Gerhard Küntscher

## Introduction

Research on “excellence” in surgery sometimes highlights work by Nobel Prize laureates such as Theodor Kocher (1841–1917) (1909), Alexis Carrel (1873–1944) (1912), or Joseph Murray (1919–2012) (1990), but also achievements by Nobel Prize nominees who never received the award [1]. Recent contributions have focused on the latter, e.g. on scholars in brain- and neurosurgery like Harvey Cushing (1869–1939) and Victor Horsley (1857–1916) [2], in cardiac surgery like Alfred Blalock (1899–1964) and Helen B. Taussig (1898–1986) [3], or in otorhinolaryngology like

Gustav Killian (1860–1921) and Themistocles Gluck (1853–1942) [4]. This paper aims at providing a general overview of orthopaedic surgeons as candidates for the Nobel Prize in general, and, in particular, at reconstructing key arguments in the proposals for two German researchers: Friedrich Pauwels (1885–1980) and Gerhard Küntscher (1900–1972). The importance of these pioneers were (along with Adolf Lorenz (1854–1946)—see below—and Lorenz Böhler

---

Illustration: Painting by Johannes Grützke, Berlin: “Aus der Geschichte der Unfallchirurgie” (Küntscher in green jacket). (Wikipedia—free access)

---

✉ Nils Hansson  
nils.hansson@hhu.de

<sup>1</sup> Department for the History, Philosophy, and Ethics of Medicine, Faculty of Medicine, Heinrich-Heine-University Duesseldorf, Universitätsstr. 1, 40225 Duesseldorf, Germany



(1885–1973)) underlined by Philippe Hernigou in a paper on the “Vienna and German heritage of orthopaedics from the first half of the twentieth century” [5]. The main sources for this paper are Nobel Prize nomination letters collected in the Archive of the Nobel Committee at the Karolinska Institute in Solna, Sweden. There is a 50-year delay before the Nobel archive files are made available, so that it is not yet possible to provide a complete overview of all nominations and evaluations by the Nobel Committee for Pauwels and Küntscher. Nevertheless, the nominations give new perspectives on the reputation of these scholars. This study is part of the larger project “Enacting Excellency: Nobel Prize nominations for surgeons 1901–1960”.

### Nominated orthopaedic surgeons for the Nobel Prize in physiology or medicine

Among the numerous surgeons nominated for the Nobel Prize, several were proposed because of their work in orthopaedic surgery. Ferdinand Sauerbruch (1875–1951), who was put forward in more than 50 nominations and thereby counts as one of the most often nominated surgeons, was by his sponsors next to his studies in thoracic surgery also praised for work on arm prostheses (“Der Sauerbruch-Arm”). In a Nobel Committee evaluation, Sauerbruch’s achievement was compared to the work of another nominee, the Italian orthopaedic surgeon Giuliano Vanghetti (1861–1940), but neither of them was finally selected [6]. They were in good company: Other candidates with orthopaedic interests who never received the medal were the Swedish orthopaedic surgeon Gustav Zander (1835–1920) for the development of mechanical gymnastics as a method of rehabilitation [7], the abovementioned Themistocles Gluck for work on artificial joints, or the French surgeon Pierre Delbet (1861–1957), nominated for research on battle injuries and fractures in 1926.

Not that surprisingly, several orthopaedic surgeons were proposed by their peers. Patrik Haglund (1870–1937) for instance, Scandinavia’s first professor of orthopaedic surgery, used two of his nomination invitations (1925, 1926) to present Adolf Lorenz to the prize jury. The Nobel Committee received at least eight nominations in favour of Lorenz from 1904 to 1933, predominantly motivated by work on the reposition of congenital hip-joint luxation and the treatment of club and flat foot. In 1924, the Minnesota surgeon Emil S Geist (1850–1926) wrote in his nomination letter:

...“I believe the proper name to consider for this honour is the name of Professor *Adolf Lorenz* of Vienna, Austria. Professor Lorenz is an orthopaedic surgeon of international reputation. His original work on the treatment of club foot, flat foot and especially congenital

dislocation of the hip, has resulted in the cure of thousands of cripples the world over. Trusting that your Committee will seriously consider this nomination and thanking you for the honour of having permitted me to make this nomination. Very truly yours, Emil S. Geist.” (Nobel archive, Nobel yearbook 1924).

### Nominations for Friedrich Pauwels and Gerhard Küntscher

Since other scholars have provided ergobiographical information as well as accounts of Pauwels’ and Küntscher’s major achievements [8, 9], I will in the following give only brief sketches and then present nominations, two for Pauwels, and five for Küntscher.

#### Friedrich Pauwels

After medicine studies in Lausanne and Freiburg in Breisgau, Pauwels worked for Alfred Schanz (1868–1931) in Dresden and Adolf Lorenz in Vienna. In 1924, he was appointed head of an orthopaedic department in Aachen, Germany, where he contributed in developing a new theory of functional anatomy—he was later referred to as the “father of modern biomechanics” [10, 11]. His book “Biomechanics of the Normal and Diseased Hip Theoretical Foundation, Technique and Results of Treatment. An Atlas,” was published in several languages [12]. Pauwels received, among other awards, the Umberto Prize (Bologna University) and the “Danis Prize” of the Société Internationale de Chirurgie. In the Nobel Prize nominations submitted in 1960 and in 1961, he was proposed as candidate by the Frankfurt anatomist and biologist Dietrich Starck (1908–2001) and the Frankfurt orthopaedic surgeon Eduard Gütz (1903–1973). Starck emphasized Pauwels profound anatomical interests, and added (October 29, 1960):

“Pauwels began almost 30 years ago with a systematic study of the functional morphology of the musculoskeletal system based on clinical observation aiming at a practical application in orthopaedic surgery. [...] New theoretical foundations had to be created, especially since various questions that were decisive for the solution of the biological problem had not yet been clarified by basic researchers. [...] He was also the first to introduce the optics of tension in biological-medical research.” (Nobel archive, Nobel yearbook 1961).

Pauwels' combination of basic and clinical research was highlighted by Güntz (January 27, 1961):

“Prof. Pauwels has worked in the field of bone reconstruction and remodeling. He has repeatedly given the clinician new insights. [...] I consider the merits of Prof. Pauwels to be particularly valuable and above average, and so important for patients, that I feel obliged to propose him in accordance with the conditions laid down in the statutes of the Nobel Prize Foundation for the awarding of this greatest and most prestigious prize in the world”. (Nobel archive, Nobel yearbook 1961).

In 1961, the Nobel Committee did not recommend Pauwels for a special investigation, which is the next step in the selection process. Some of the “short-listed” candidates that year were basic researchers and to be selected during the subsequent years, e.g. the Australian neurophysiologist John C. Eccles (1903–1997) and the American biochemist and urologist Charles B. Huggins (1901–1997).

### “A new era of fracture treatment has begun”: Gerhard Küntscher

In a New York Times obituary of Gerhard Küntscher in December 1972, the concept of intramedullary nailing of fractures method was central: “Dr. Küntscher attained renown with his method for rejoining fractured bones by placing metal rods or needles lengthways inside the bones. The technique became known as the Küntscher method” [13]. Today, more than 45 years later, Gerhard Küntscher is still widely regarded as the key inaugurator of the intramedullary nailing of long bone fractures [14]. Commentators have recently described the “Kuntscher nail [...] as the most important advancement in trauma surgery” [15]. In retrospect, however, the introduction of the procedure seems not to have been an entire success story. After his first scientific presentations to German colleagues in the late 1930s, the reactions ranged from cautious optimism to rejection [16]. The mixed reactions were reflected in a Nobel nomination letter by the previously mentioned Eduard Güntz in 1956:

“Risk of bone marrow damage and fat embolisms were regarded as possible risks, so that Küntscher had difficulties to continue working on the procedure. However, it has been found that with the proper implementation of such an intramedullary nailing, these risks are averted.

After the war, this method has been spread throughout the world.” (Nobel archive, Nobel yearbook 1956).

Güntz added that also other scholars were interested in the topic, but there were in his view no scientific priority disputes: “I personally observed the development and experimental foundation of Küntscher’s ideas. The so-called femoral neck nailing according to Smith-Petersen is something completely different”. Indeed, Marius Smith-Petersen (1886–1953) [17] had in 1951 also been nominated for the Nobel Prize for treatment of femoral collum fractures.

In a 1951 nomination of Küntscher, the Frankfurt surgeon Rudolf Geissendörfer stressed another argument: “This procedure brings about not only less hospital days [...] for patients, it also ensures ideal bone fracture healing [...]. The criticism that the procedure might damage the medullary cavity has not been confirmed. This is probably also the reason why the procedure has begun a triumphal march around the globe.” (Nobel archive, Nobel yearbook 1951).

Moreover, the Leipzig professor of orthopaedic surgery Peter Friedrich Matzen (1909–1986) argued in his nomination letter for Küntscher in 1957: “Today, the intramedullary nail made by surgeons all over the world has become indispensable [...] it is an aid that no one can do without.” Similarly, professor of surgery Robert Wanke (1896–1962) wrote in 1961 that the introduction of the nail “has become gold standard. Mr. Küntscher is one of the most famous surgeons in the world and at the same time one of the most recognized researchers in the field of biology and pathology of the bone system. The procedure of intramedullary nailing today in the age of increasing traffic surgery means an invaluable benefit to humanity.” (Nobel archive, Nobel yearbook 1961).

The same year (1961) another nomination written by surgeon Werner Forssmann (1904–1979), Nobel Prize laureate in physiology or medicine for work on cardiac catheterization in 1956, reached the Committee. He nominated Küntscher and the American surgeon Leslie V. Rush (1905–1987): “Küntscher has introduced the rigid intramedullary nail and Rush the pin [federnder pin]. [...] Yes, one can say that a new era of bone fracture treatment has begun”. (Nobel archive, Nobel yearbook 1961).

Küntscher’s legacy lives on not only in the eponym, it also exists a “Küntscher Society” dedicated to intramedullary nailing. He never received a chair in orthopaedic surgery, but he got several acknowledgments for his work, e.g., the “Danis-Preis” (like Pauwels), the Paracelsus-Medal, an honorary doctorate at Kiel University, and an honorary membership in the German Society of Surgery. Until 2013, there was a Gerhard-Küntscher-street in the city of Flensburg in northern Germany (where he worked later in life without academic affiliation); however, it was renamed after historians had found ties between Küntscher and the National Socialist regime (e.g. NSDAP-membership) [18].

## Coda: scientific excellence in orthopaedic surgery

The concept of excellence in surgery is ubiquitous, yet hard to define, or to speak with the sociologist Robert Merton (1910–2003): “Many of us are persuaded that we know what we mean by excellence and would prefer not to be asked to explain” [19]. Prestigious awards such as the Nobel Prizes are often used as a parameter to show how excellence was defined at a given point in time. From today’s perspective, orthopaedic surgeons probably agree that John Charnley (1911–1982) should have received the award for the design of the total hip arthroplasty, or as the medical historian William Bynum phrased it: “In terms of helping humanity, John Charnley [...] deserved but did not receive [a Nobel Prize] for his pioneering research on the technology and surgical approaches to hip replacement” [20]. To date, no orthopaedic surgeon has been awarded a Nobel Prize for orthopaedic research, although some prize motivations have links to field, e.g. Shinya Yamanaka’s award in 2012 for “for the discovery that mature cells can be reprogrammed to become pluripotent” [21]. Historically, the Nobel Committee has selected more basic researchers than clinicians, a trend that has become even stronger during recent decades [22], but it still is an open question why orthopaedic surgeons are under-represented among the laureates. This paper demonstrates that researchers in orthopaedic surgery were repeatedly nominated. The nominations open a new window to reflect on pioneers in the field and raise new questions on how scientific excellence in orthopaedic surgery has been enacted over time. Further historical research aims at giving a fuller picture of nominated scholars and other manifestations of excellence in orthopaedic surgery during the twentieth century.

**Acknowledgments** Files on surgeons were kindly provided by the Nobel Committee for Physiology or Medicine, Medicinska Nobelinstitutet, Solna, Sweden. All translations from German into English were done by the author.

## Compliance with ethical standards

**Conflict of interest** The author declares that he has no conflict of interest.

**Ethical approval** This article does not contain any studies with human participants or animals performed by the author.

## References

- Hansson N (2018) Anmerkungen zur wissenschaftshistorischen Nobelpreisforschung. *Ber Wiss* 41(1):7–18
- Hansson N, Schlich T (2015) “Highly qualified loser”? Harvey Cushing and the Nobel prize. *J Neurosurg* 122(4):976–979
- Hansson N, Schlich T (2015) Why did Alfred Blalock and Helen Taussig not receive the Nobel Prize? *J Card Surg* 30(6):506–509
- Hansson N, Halling T, Fangerau H (2016) The Nobel Prize and otolaryngology: ‘Papa Gunnar’s’ promotion of his peers Gustav Killian and Themistocles Gluck. *Acta Otolaryngol* 136(9):871–874
- Hernigou P (2016) The Vienna and German heritage of orthopaedics from the first half of the twentieth century: Adolf Lorenz, Lorenz Böhrler, Friedrich Pauwels, Gerhard Küntscher. *Int Orthop* 40(5):1049–1058
- Hansson N, Schagen U (2014) “In Stockholm hatte man offenbar irgendwelche Gegenbewegung” – Ferdinand Sauerbruch (1875–1951) und der Nobelpreis. *NTM* 22(3):133–161
- Hansson N, Ottosson A (2015) Nobel prize for physical therapy? Rise, fall, and revival of medico-mechanical institutes. *Phys Ther* 95(8):1184–1194
- Zichner L, Rauschmann MA, Thomann K-D (2000) *Geschichte operativer Verfahren an den Bewegungsorganen*. Steinkopff, Darmstadt
- Maquet P (1980) Friedrich Pauwels (1885–1980). *Int Orthop* 4(3):237–238
- Zuschwerdt L (1965) Friedrich Pauwels zur Vollendung seines 80. Lebensjahres am 23. Mai 1965. *Archiv für orthopädische und Unfall-Chirurgie* 57:261–263
- Pauwels F (1935) *Der Schenkelhalsbruch - Ein mechanisches Problem. Grundlagen des Heilungsvorganges, Prognose und kausale Therapie*. Enke, Stuttgart
- Pauwels F (1973) *Atlas zur Biomechanik der gesunden und kranken Hüfte*. Springer-Verlag, Berlin-Heidelberg-New York
- <https://www.nytimes.com/1972/12/19/archives/crhagdunktischer-ev-sone-eg.html> Accessed 3 July 2018
- Küntscher G (1940) Die Marknagelung von Knochenbrüchen: Tierexperimenteller Teil. *Klin Wochenschr* 19(1):6–10
- Mari R, Valverde Vilamala D, León García A, Guirro P, Marqués López F (2016) A technical note for extracting an incarcerated femoral Kuntscher nail. *J Orthop Case Rep* 6(3):10–12
- Küntscher G (1941) Die Technik der Marknagelung des Unterschenkels und Oberarmes. *Zentralbl Chir* 68:1138–1153
- Hernigou P (2014) Smith–Petersen and early development of hip arthroplasty. *Int Orthop* 38:193–198
- Ratschko K-W, Mehs S (2011) Der andere Küntscher: nicht nur Marknagelung und Anekdoten. *Schleswig-Holsteinisches Ärzteblatt* 5:56–63
- Merton RK (1973) Recognition and excellence: instructive ambiguities. In: Merton RK (ed) *The sociology of science*. University of Chicago Press, Chicago
- Bynum W (2008) *The history of medicine: a very short introduction*. Oxford University Press, Hampshire, p 131
- Ochi M (2013) Shinya Yamanaka’s 2012 Nobel Prize and the radical change in orthopedic strategy thanks to his discovery of iPS cells. *Acta Orthop* 84(1):1–3
- Hansson N, Halling T (eds) (2017) *It’s Dynamite – Der Nobelpreis im Wandel der Zeit*. Cuvillier, Göttingen