“Highly Qualified Loser”? Harvey Cushing and the Nobel Prize

Nils Hansson, PhD,¹ and Thomas Schlich, MD²

¹University Medical Center, Department of Medical Ethics and History of Medicine, Göttingen, Germany; and ²McGill University, Department of Social Studies of Medicine, Montreal, Quebec, Canada

Neurosurgery, in particular surgery of the brain, was recognized as one of the most spectacular transgressions of the traditional limits of surgical work. With their audacious, technically demanding, laboratory-based, and highly promising new interventions, prominent neurosurgeons were primary candidates for the Nobel Prize. Accordingly, neurosurgical pioneers such as Victor Horsley and, in particular, Harvey Cushing continued to be nominated for the prize. However, only António Egas Moniz was eventually awarded the prestigious award in 1949 for the introduction of frontal lobotomy, an intervention that would no longer be prize-worthy from today's perspective. Horsley and Cushing, who were arguably the most important proponents of early neurosurgery, remained “highly qualified losers,” as such cases have been called. This paper examines the nominations, reviews, and discussions kept in the Nobel Archives to understand the reasons for this remarkable choice. At a more general level, the authors use the example of neurosurgery to explore the mechanisms of scientific recognition and what could be called the enacting of excellence in science and medicine.

<http://thejns.org/doi/abs/10.3171/2014.11.JNS14990>

KEY WORDS history of brain surgery; Nobel Prize for Physiology or Medicine; Harvey Cushing; Victor Horsley; Egas Moniz

Honors had kept coming his way, most notably a fellowship in the enormously prestigious Royal Society, a unique distinction for an American surgeon. He was nominated for the Nobel Prize in Physiology or Medicine on several occasions between 1934 and 1936 – possibly in other years as well – both for his achievements in neurosurgery and for the delineation of pituitary basophilism. [...] He expressed no regret when the prizes went to others. ‘Fame lies in the silence – not in the song’, he told [Arnold] Klebs.

— *Michael Bliss*²

In his great biography of Harvey Cushing (1869–1939), Michael Bliss draws attention to a hitherto unknown aspect of Cushing's reputation in the scientific community.² This paper aims at filling this gap and takes a first look at the question as to why Cushing did not receive the Nobel Prize for Physiology or Medicine. As a main source we have gathered files from the Nobel Prize archive in Stockholm, a remarkable repository that contains correspondence, reports, and dossiers of the nominations of senior and junior physicians from around the world. Every year all professors of medicine in Sweden, Denmark, Finland, Iceland, and Norway, as well as former Nobel laureates, may nominate a scholar for the Nobel Prize for Physiology or Medicine. Moreover, a few universities and scientific

associations worldwide are invited each year to propose candidates.

The archive has begun to be used more by scholars, but it has been insufficiently examined by historians of surgery. In addition to the files on Cushing, we will also discuss the Nobel committee evaluations of two other pioneers in the field of brain surgery: Victor Horsley (1857–1916) and António Egas Moniz (1874–1955). Although all of them received multiple nominations for the Nobel Prize for Physiology or Medicine, only Moniz was eventually awarded the prestigious prize. Cushing and Horsley therefore fall into a category, which somewhat provocatively has been called “highly qualified losers.”¹

Harvey Cushing and Victor Horsley

Cushing was nominated at least 38 times for the Nobel Prize for Physiology or Medicine. That makes him one of the most often nominated surgeons for the Nobel Prize during the first half of the 20th century. One should bear in mind that the number of Nobel Prize nominations of researchers alone does not really reflect their importance, but it might give a hint of their worldwide reputation, given that the number is high and that the nominators are inter-

SUBMITTED May 7, 2014. **ACCEPTED** November 6, 2014.

INCLUDE WHEN CITING Published online January 2, 2015; DOI: 10.3171/2014.11.JNS14990.

DISCLOSURE The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

nationally diverse. Among surgeons, probably only Ferdinand Sauerbruch was nominated more often (65 times).⁵ However, the Nobel committee chose to thoroughly evaluate Sauerbruch's work on only two occasions, whereas we have found extensive reports on Cushing in the Nobel Archive yearbooks of 1930, 1931, 1932, 1935, and 1936. These reports, confidentially requested by the Nobel committee, offer a real-time perspective on how Cushing's achievements were interpreted in the 1930s. In order for the Nobel committee to get a nuanced view on his work, experts discussed the statements of the nominators and the strengths and weaknesses of Cushing's methods from their individual perspective. Thus, Cushing's studies were analyzed by a physiologist, a surgeon, a neurosurgeon, a pharmacologist, a pathologist, and a neurologist.¹⁰ The Nobel committee probably found this procedure necessary because of the fact that Cushing's work could not solely be seen as surgical, but rather interdisciplinary, or as the American neurologist George B. Hassin put it in his nomination of Cushing on December 26, 1934:¹⁵

The subject of pituitary basophilism which of late attracted great attention of clinicians, physiologists, histologists and neurosurgeons is only one of the many phases in the domains of endocrinology and surgery of the central nervous system which professor Cushing furthered by his remarkable achievements as an experimenter, author and teacher of numerous splendid neurosurgeons the world over.

In several nominations, Cushing was portrayed as "the world's greatest cerebral surgeon [...] a man of great culture and a brilliant writer,"²² as stated by the British surgeon Harold J. Stiles in 1922. Other nominators argued that Cushing had contributed considerably to the field of brain surgery, especially concerning difficult brain operations on intracranial tumors. In 1931, the Swedish neurologist Henry Marcus wrote in his nomination that Cushing had managed to decrease the operation mortality rate to 10% by using x-rays to diagnose brain tumors, electrical stimuli for study of the human sensory cortex, and the electrocautery tool.¹⁷ Therefore, Marcus wrote, such operations were not a "danse macabre" any longer. In the very same year, at the First International Neurological Congress held in Berne on August 31, 1931, Cushing outlined the decreases in mortality that had occurred in specific categories, such as gliomas (30.9% down to 11.1%), pituitary adenomas (13.5% down to 5.7%), and meningiomas (21.0% down to 7.7%). These data were based on the 2023 verified tumors that he had operated on.

In other case studies of Nobel Prize candidates, scientific priority disputes tend to play a crucial role in the Nobel committee reports. For example, the decisive factor as to why Ferdinand Sauerbruch was not considered prize-worthy was that ultimately he could not be seen as primary inventor of the pressure chamber for open thorax operations (Carlo Forlanini and Ludolph Brauer had worked on a similar apparatus).⁵ Therefore, the Nobel committee could not recognize Sauerbruch as "the person who shall have made the most important discovery within the domain of physiology or medicine," a quotation from the will of Alfred Nobel, written in 1895.¹ In the Nobel committee reports on Cushing, such priority disputes are not that clear. In 1931, the reviewer Gustaf Söderlund, a

surgeon himself, found that Cushing had "revolutionized brain surgery," but he could not single out one achievement as groundbreaking. However, that did not stop him from recommending Cushing. As a key argument, Söderlund submitted another document in addition to his report, where he compared Cushing's work with that of Alexis Carrel:²¹

Finally, I would like to remind you of the fact, that Carrel (1912) received the Nobel Prize for his achievements in terms of the development of the vascular suture, and he thereby obtained good results in organ transplants. It seems to me as if Carrel's and Cushing's efforts would offer definite similarities. Through modifications of a known method, Carrel managed to make it available for surgical procedures. Correspondingly, Cushing has made it possible to operate within the nervous system and obtaining results, which without Cushing's discoveries had not been possible.

For 1932, Cushing had also been nominated by Ludwig von Zumbusch, Friedrich von Müller, Oswald Bumke, Max Borst, Thomas Rivers, and Karl Landsteiner. As a result, the third comprehensive report on Harvey Cushing in 1932 was requested by the Nobel committee. It was written by Herbert Olivecrona, the "founder of Swedish neurosurgery,"⁶ who in 1919 had worked with Cushing at the Johns Hopkins Institute in Baltimore. In his report, Olivecrona mentioned a few pioneers in the recent history of brain surgery, such as MacEwen, von Bergmann, Wagner, Krause, and Godlee as early investigators, and Horsley in particular:¹⁹

Horsley, however, was the central figure in this stage of brain surgery development. Already in the 1890s, Horsley could announce the results of a for that time considerable number of surgeries for brain tumors. [...] Horsley, v. Eiselsberg and others used methods taken directly from traditional surgery for this purpose, namely to enucleate a tumor with the finger.

Like Cushing, Victor Horsley was in his time an internationally renowned pioneer in neurosurgery and fellow of the Royal Society. From 1908 to 1913, Horsley was nominated nine times for the Nobel Prize, and his work was evaluated on five occasions during that time period. Similar to the nominations of Cushing, Horsley did not get attention for one single achievement, but for his all-around work in the field of neurosurgery. Hence, the motivation that Karl Petrén gave for his nomination of Horsley in 1908 for "investigations on the functions of the central nervous system and their practical use in the surgery of the central nervous system"²⁰ was characteristic. The reviewer Frithiof Lennmalm characterized Horsley as a surgeon and a physiologist:¹⁶ "He dares to perform bold new interventions on the brain. However, even if he has a breathtaking experimental skill, he sometimes thinks more like an experimental physiologist than as a reflective clinician." The report coincides with the fact that, from the 1880s onwards, physiological surgery received increasingly more attention.²³ Leading surgeons worked in close collaborations with physiologists, or even had their own laboratories. In 1911, the reviewer Jules Åkerman argued that Horsley was an excellent candidate, and that he would be a safe choice:¹¹ "If Horsley gets the prize, the reactions will be marked by a general understanding and universal recognition." Two years later, in 1913, Åkerman

wrote another report about Horsley, “the best contemporary brain physiologist, and also the best contemporary brain surgeon. [...] I want to stress that I don’t know any scientist who has done more for practical medicine than Horsley [...]. He should get the Nobel Prize for his surgery on the central nervous system.”¹² However, his jury peers were not convinced.

In spite of Horsley and the above-mentioned predecessors, Olivecrona saw Cushing as a very strong candidate and gave him a full recommendation for the Nobel Prize. However, not all reviewers were positive that Cushing was an obvious choice. In the view of the reviewers Göran Liljestrand, a pharmacologist (report 1932), and Folke Henschen, a pathologist (report 1935), Cushing should be put on a wait-and-see-list, and further evaluations should be conducted to fully grasp his achievements.

The last Nobel committee evaluation on Cushing was conducted by the neurologist Nils Antoni in 1936. According to Antoni, Cushing had contributed with numerous “mosaic stones” to the field of brain surgery. He admitted that some of those were already known (borrowed techniques from orthopedic and plastic surgery), but the whole resulting panoramic image “painted” by Cushing had brought about groundbreaking results. According to Antoni, this new repertoire for performing brain surgery, which Cushing had evoked, included: 1) cautious handling of the organ; 2) the principles of meticulous hemostasis; 3) blood transfusion during the operation; 4) measures of cleanliness and hygiene with wet patches of woolen fabric and the electric saw; 5) operation in one go; 6) the new method of decompressive trepanation by which liquor fistulas can be prevented; 7) the exact reconstruction of the wound at all levels; 8) electric coagulation and method of hemostasis and excochleation; 9) prophylactic puncture of the ventricles; and 10) conscientious postoperative treatment. In Antoni’s view, the total value of all these contributions would justify a prize. Altogether, these contributions had led to a decreased mortality rate due to brain surgery operations and to a better prognosis.

The German surgeon Oswald Bumke added in his proposal that Cushing’s idea of a successful operation depended upon good organization, detail, patience, extreme carefulness, and unlimited time. Accordingly, Cushing himself explained, probably inspired by his teacher William Steward Halsted, that the best brain surgeon “had to aspire to put on a tedious and dull show.”¹³ Bumke suggested that these principles not only had been acknowledged in the US, but also by European surgeons such as Martel and Vincent (France), Cairns (Great Britain), and Foerster and Sauerbruch (Germany).¹⁴ Nearly all of Cushing’s nominators stressed that they saw him as an internationally admired surgeon. The German surgeon Friedrich von Müller even wrote that Cushing had “become the teacher of all surgeons of the world.”¹⁸

In 1932 and in 1935, Cushing was the only surgeon on the short list of the Nobel committee. In 1936, the list also included the brain surgeon Walter E. Dandy. Thus, Antoni suggested, Cushing should share the Prize with Dandy:¹³ “Together, they are the real creators of modern brain surgery.” Dandy had been nominated in 1934 and 1936 for his work on the introduction of ventriculography and en-

cephalography and for his studies on the circulation of the CSF. Herbert Olivecrona and Nils Antoni voted in favor of Cushing and Dandy, and suggested the prize motivation “for discovering the technological principles of the successful treatment of brain tumor disease,” but they did not manage to persuade the other professors in the Nobel committee. In 1936, the Nobel Prize in Physiology or Medicine was awarded jointly to Sir Henry Dale and Otto Loewi “for their discoveries relating to chemical transmission of nerve impulses.”

António Egas Moniz

Considering that Cushing did not get the Nobel Prize, from today’s perspective, awarding the prize to the Portuguese surgeon Egas Moniz in 1949 for his experiments with lobotomy appears most questionable. What was the difference? In 1936, Moniz published a monograph on the operative treatment of certain psychoses, which described the operation of prefrontal lobotomy and the impressive results of its application to 20 cases of psychosis. The nominators of Moniz were enthusiastic about the idea and implementation of lobotomy as treatment for severe psychotic disorders.⁹ The Swedish historian Carl-Magnus Stolt has evaluated the Nobel Prize files on this interesting case.²³ His study shows that Moniz was nominated by 18 scientists from Portugal, Brazil, the US, and Denmark from 1928 to 1950. Moniz’s fame rested on two contributions to medical practice, angiography and lobotomy. Between 1927 and 1937, Moniz had introduced and developed cerebral angiography as a method of diagnosis of intracranial disease (evaluated negatively by Olivecrona in 1937). The lobotomy was the main topic in a report by the psychiatrist Erik Essen-Möller in 1944:²³ “[T]he procedure is and will remain a mutilating operation. The question is, whether the positive effects will outweigh the negative. That seems to be the implication drawn from literature in this case, where one needs to bear in mind that the negative side has yet to be heard.”

In his second review written in 1949, Olivecrona argued that Moniz and the Swiss physiologist Walter Rudolf Hess jointly should be awarded the Prize. Olivecrona described the lobotomy as “a great therapeutic step forward.”²³ The Nobel committee evaluations raised questions about why this kind of research was seen as revolutionary since its long-term clinical results were not yet known. However, lobotomy at that time was already acknowledged in some countries. In 1949, approximately 5000 lobotomies had been performed in the US alone.²³ Since it was not announced until the end of September 1949, the Nobel Prize award probably did not have a strong impact on that number. During the week prior to the Nobel Prize ceremony, the choice of the Nobel Assembly was discussed with cautious skepticism in the journal *Nature*.⁸

Although leucotomy is applicable in fewer cases and is more drastic than either insulin comas or electroplexy, the two other innovations which have recently revolutionized the treatment of mental disorders, the work of Prof. Moniz has exerted at least as important an influence, because he directed the attention of neuro-surgeons to psychiatric problems. The procedure which he devised may eventually be superseded; but the lesson which he has taught will not quickly be forgotten, for,

with the neurosurgeons who have followed him, he has played a large part in reviving in psychiatry a tradition of courageous and energetic treatment, and he demonstrated that skillful intervention may yield a degree of success even in the most serious and advanced cases of psychosis.

Conclusions

Because neurosurgery, and in particular surgery of the brain, was recognized as one of the most spectacular transgressions of the traditional limits of surgical work, it is not surprising that accomplishments within this field would be considered worthy of the Nobel Prize. With their audacious, technically demanding, laboratory-based, and highly promising new interventions, prominent neurosurgeons were primary candidates for the prize. Accordingly, neurosurgical pioneers such as Victor Horsley and, in particular, Harvey Cushing continued to be nominated for the prize. However, only António Egas Moniz was eventually awarded the prestigious award in 1949 for the introduction of frontal lobotomy, an intervention that would no longer be prize-worthy from today's perspective. Why did Horsley and Cushing remain "highly qualified losers"?⁷ In general, nominations, reviews, and the eventual decisions about the prize are always influenced by the interests and predilections of the scientists and doctors involved in the final choice. As Friedman has phrased it, "the selection process has a human face."²⁴ So there are always contingent factors involved in the award of the Nobel Prize. Comparing the documentations on the various Nobel candidates in the field of neurosurgery, however, reveals a possible pattern of such reward mechanisms. Compared with the nomination for Moniz, who got the prize in 1949, and also the earlier ones for the surgeons Kocher and Carrel (Nobel laureates in 1909 and 1912), the nominators of Horsley and Cushing did not pinpoint one major achievement, even though their contributions turned out to be of more value than those of Moniz. Alfred Nobel had stipulated that the Prize should go to the person whose work in the preceding year contributed most to the benefit of humankind. The Nobel Prize committee for Physiology or Medicine tried to follow this stipulation by finding the one person who was responsible for the single most important breakthrough discovery within the previous couple of years.

The accomplishments that were attributed to men like Horsley, and in particular to Cushing, could not be captured in one short sentence; they required further detailed explanations. In this way, they elude the "breakthrough" model that appears to be very much at the root of the entire Nobel Prize venture and governed the enactment of excellence in the specific context of such an award. Moniz fit that bill much better.

Acknowledgment

Files on Cushing, Horsley, and Moniz in the Nobel Archive were kindly provided by the Nobel Committee for Physiology or Medicine, Medicinska Nobelinstitutet, Solna, Stockholm, Sweden.

References

NOTE: References 10–22 were not verified at the source by the *Journal of Neurosurgery*. These references were researched by the authors at the Nobel Archive and we trust their validity.

1. Alfred Nobels testament. **Nobelprize**. (http://www.nobelprize.org/alfred_nobel/will/testamente.html) [Accessed November 12, 2014]
2. Bliss M: **Harvey Cushing: A Life in Surgery**. New York: Oxford University Press, 2005
3. Cushing H: I. The control of bleeding in operations for brain tumors: with the description of silver "clips" for the occlusion of vessels inaccessible to the ligature. **Ann Surg** **54**:1–19, 1911
4. Friedman RM: **The Politics of Excellence: Behind the Nobel Prize in Science**. New York: Times Books, 2001, p 271
5. Hansson N, Schagen U: ["In Stockholm they apparently had some kind of countermovement" – Ferdinand Sauerbruch (1875–1951) and the Nobel prize.] **NTM** **22**:133–161, 2014 (Ger)
6. Ljunggren B: Herbert Olivecrona: founder of Swedish neurosurgery. **J Neurosurg** **78**:142–149, 1993
7. Lutzenberger F: Excellence and chance: the Nobel Prize case of E. von Behring and E. Roux. **Hist Phil Life Sci** **18**:225–238, 1996
8. Nobel Prize for Physiology or Medicine for 1949. **Nature** **164**:947, 1949
9. Pressmann JD: **Last Resort: Psychosurgery and the Limits of Medicine**. Cambridge: Cambridge University Press, 1998
10. Report for the Nobel Committee: Hans Gertz, 1930; Gustaf Söderlund, 1931; Herbert Olivecrona, 1932; Göran Liljestrand, 1932; Folke Henschen, 1935; Nils Antoni, 1936
11. Report for the Nobel Committee: Jules Åkerman, 1911
12. Report for the Nobel Committee: Jules Åkerman, 1913
13. Report for the Nobel Committee: Nils Antoni, 1936
14. Report for the Nobel Committee: Oswald Bumke, 1932
15. Report for the Nobel Committee: George B. Hassin, 1934
16. Report for the Nobel Committee: Frithiof Lennmalm, 1909
17. Report for the Nobel Committee: Henry Marcus, 1931
18. Report for the Nobel Committee: Friedrich von Müller, 1931
19. Report for the Nobel Committee: Herbert Olivecrona, 1932
20. Report for the Nobel Committee: Karl Petré, 1908
21. Report for the Nobel Committee: Gustaf Söderlund, 1931
22. Report for the Nobel Committee: Harold J. Stiles, 1922
23. Stolt CM: Moniz, lobotomy, and the 1949 Nobel Prize, in Crawford ET (ed): **Historical Studies in the Nobel Archives: The Prizes in Science and Medicine**. Tokyo: Universal Academy Press, 2002, pp 79–94

Author Contributions

Conception and design: both authors. Acquisition of data: both authors. Analysis and interpretation of data: both authors. Drafting the article: both authors. Critically revising the article: both authors. Reviewed submitted version of manuscript: both authors. Approved the final version of the manuscript on behalf of both authors: Hansson. Administrative/technical/material support: both authors. Study supervision: both authors.

Correspondence

Nils Hansson, University Medical Center, Department of Medical Ethics and History of Medicine, Humboldtallee 36, D-37073 Göttingen, Germany. email: nhansso@gwdg.de.