Prizes? What prizes?

Preface by Klaas Landsman

Until recently, my view of scientific prizes (including memberships of Royal Societies and Academies etc.) was that really great scientists like Einstein do not need them since they have "made it" anyway, that really bad scientists should not get them either for obvious reasons, and that in the remaining grey zone prizes do more harm than good, since for every scientist who wins a prize there are dozens who do not, although they would be just as deserving of them. Still in the grey zone, even if there actually are tiny differences between winners and non-winners, these tend to be amplified by the Matthew effect (i.e., those who win one prize have a much better chance of winning the next even without any further achievements), which amplifies an already slightly unfair situation to sometimes colossal proportions. Furthermore, in the spirit of Michel Foucault, I felt that awards often reflect power structures and nepotism in that winners or jury members who choose them may not be the best scientists but are those that rule science: this applies from best poster awards for youngsters to Nobel Prizes – just think of the many women who should have won the latter but were sadly passed over in favour of men – and it even applies more abstractly to dominant areas of research. Finally, as in (top) sports, prizes increase the danger that doing (top) science becomes a race whose goal is winning, as opposed to lofty ideals such as beauty and truth, or simply self-realization through excellence as such. In other words, prizes promote competition rather than collaboration.

My negative attitude changed considerably after I won a prestigious prize myself (and a few years earlier had become a member of the Royal Netherlands Academy of Arts and Science). Three recent Nobel Prizes also played a role in doing my about-face: to Roger Penrose in 2020 for Physics (robustness of black hole formation), to Guido Imbens in 2021 for Economic Sciences (analysis of causal relationships), and to Katalin Karikó in 2023 for Physiology or Medicine (mRNA vaccines against COVID-19). Each story is one of passionate truth-finding from an outsider point of view, without any obvious lobby or power structure behind the award, which recognized work that genuinely benefits mankind – including Penrose's, since besides a fairer and healthier world, understanding the Cosmos is also one of our goals. In a rather more infinitesimal realm of importance, I was very pleased to learn that other people even knew my work, in addition to

appreciating it. And surely many of those who are genuinely surprised by some prize feel likewise.

In conclusion, I still believe that all my earlier arguments are correct and would not shed a tear if all scientific prizes were abolished (having cashed mine in already); but I am also beginning to see a glimpse of light. It is popular these days to emphasize the value of team science, but in many cases public (and monetary) recognition of someone's individual struggle and ensuing insights and achievements are at least as important. Well-deserved prizes may serve this goal at any career stage.

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CHAPTER ONE

Introducing Prize Studies: Perspectives on Reward Mechanisms in Science

Nils Hansson & Ad Maas

Almost every researcher's curriculum vitae follows the same general template: lists of scientific publications are followed by grants and memberships in national or international societies. In addition, scholars may finally add prizes. Unlike the impact of publications and citation patterns, and grants, which can be quantified precisely, prizes seem to elude clear classification in scientific evaluation systems. In other words: do prizes matter? Some view them merely as the cherry on the cake, but not crucial for reverberation or career advancement.[1] Others see them as atavisms: Why praise individual scholars when we know that research is often pursued in large multidisciplinary teams, sometimes in collaboration with partners from outside academia?[2]

With this book, we wish to outline a view on the role of prizes in science from a historic perspective and offer conclusions that will be relevant for universities, research centers and academic promotion committees in evaluating academic reputation. We see prizes in academia as a barometer of how we look at scientific excellence and how we value scientific practices and results, both within and outside the scientific community. Indeed, in contrast to lists of publications and grants, prizes also appeal to broader audiences – most of all, of course, Nobel Prizes. Following the early October announcements, international media outlets and local newspapers all over the world cover the laureates. Studying prize cultures therefore can help to unravel social aspects of both the scientific practice and how science is regarded in society. In a nutshell, the book aims at establishing **prize studies** as a field of research in its own right.

Science prizes shape careers, make research visible for the public, and create role models in academia and beyond. They provide evidence of scientific recognition, prestige and credit, and play a key role in the evaluation of individual scientists, for example in academic promotion committees. Nevertheless, whereas the alleged impact of citations and external funding has been a growing field of international research for decades in science studies and beyond, the understanding of prize cultures and their dynamics, in different countries or in specific fields, has remained surprisingly superficial. According to Pierre Bourdieu (1930-2002),[3]

literary prizes contribute to the conversion of symbolic capital into economic capital,[4] but it is questionable if this also is the case in the natural sciences and medicine. Prize studies then should explore the conditions, processes, functions and consequences of scientific awards. They could contribute to modern approaches in history and sociology of science that focus in particular on the social context of scientific practices and give new insights into scientific reward mechanisms and the role of credit, status and impact in academia.

We seek to show in this volume that the study of scientific prizes as a *pars pro toto* can provide important perspectives on scientific practices and cultures, both within the scientific community and in broader society. Prizes are about status, and status is a sensitive indicator of social relations. Within the scientific community numerous social mechanisms are involved in prizes. What does winning important prizes mean for a scientist's career? How do prizes privilege certain individuals, nationalities, fields and research interests, and marginalize others? What social mechanisms are involved in the selection of candidates and winners? And what does this all say about the scientific community? Which are the effects of prizes for individual scientists, institutions, scientific communities? To what extent do these effects depend on individual dispositions like gender, origin, age, and so forth?

Highly reputed prizes are used to boost scientific work, with prestigious awards being handed out to academics who have conducted and published research judged as important, outstanding, or to use the words of Alfred Nobel, that has "conferred the greatest benefit to humankind" (Nobel's will of 1895).

Several chapters in this volume reveal the pervasiveness of the narrative of the "genius," or "hero" of science in the history of the Nobel Prizes. This persona has been inherently connected to the very idea behind the Nobel Prize, which after all singles out individuals and awards personal achievements, and it has also fashioned the public image of Nobel laureates. As Källstrand succinctly writes in his chapter: "The Nobel prize has become an institution with the power to routinely create scientific heroes." This narrative therefore is a leitmotiv in this volume.[5]

The focus on brilliant individuals, in the meanwhile, has not remained unchallenged. It has been questioned, for instance, by historians and sociologists of science who consider scientists and their insights (however brilliant) rather as a product of their times, or emphasize the collaborative nature of science. Especially in recent times of big science, the relation between achievement and the individual has been increasingly questioned.

We wish to analyze the impact of prizes from three perspectives. First, from the perspective of an institution that awards the most prestigious prize in the sciences: the Nobel Foundation, as well as from Nobel laureates. Second, from the view of the scientific community, and third, from the perspective of the public understanding of science. The chosen foci of investigation are suitable for pursuing the research

questions in a methodologically exemplary manner and to prepare the ground for further research.

State of research on prizes

Following the lead of literature on scientific merit, we do not view excellence as a self-evident category. There is no way to measure scientific brilliance objectively. For example, with regards to prizes, it is not possible to compare medals in science with medals in sports. The results of athletes (who runs the fastest, who jumps the highest) can be determined objectively, but this is not the case in academia. In addition, participants in the Olympic Games compete against others in the same niche (hurdles, long jump, etc.), while the performances of scientists are hardly comparable. This makes scientific competition dependent on other factors, not least marketing strategies and personal networks. In other words, the entire prize decision-making process is an example of the staging of excellence. Thus, we consider prizes not only as the result of a strong performance, but also as a result of a construction or an attribution process.

The ongoing debate on the attribution of scientific excellence has so far centered on the distribution of research funding.[6] In his book *Die akademische Elite*,[7] sociologist Richard Münch goes into more detail about the reputation of researchers in the review process of externally funded projects. Such accounts about the task to single out the most promising scientists and projects have sparked current debates on how to find new, unorthodox ways of selecting the most important projects. For example, the Health Research Council of New Zealand launched a new type of "lottery grant" to fund research. Along those lines, Swiss scientists suggested to toss a coin to decide which candidates to appoint to academic positions. The idea is that incorporating randomness reduces bias and promotes diversity among the applicants. To our knowledge, this strategy has not yet been used in prize competitions. Prizes still benefit from an aura of objectivity, which needs to be understood more in detail.

Reputation and recognition in their turn rely heavily on visibility of scientists. Prizes bring exactly that: they give scientists status by making them visible, and their visibility gives status to prizes. To have these effects, prizes need to be staged, performed, and celebrated.[8] In the context of this book we understand attributing excellence to someone as the performative act of ascribing prize-worthiness to a person based on the perceived quality of his or her scientific work.[9] Staging is again understood as the method and process of presenting, framing, and contextualizing institutions, people, and facts.[10]

Earlier work has reflected on the impact of prizes in different fields and what the "prize population" has looked like.[11] Ma and Uzzi listed 3,000 scientific prizes in different disciplines and tried to reconstruct the careers of more than 10,000 prizewinners.[12] Among the winners since the turn of the millennium, female scientists are significantly underrepresented.[13] Scholars have also raised the issue of how prizes have been related to academic productivity,[14] stating that winners' productivity declines after the award year of big prizes.

No award has inspired as much research as the Nobel Prize, focusing mostly on the laureates and their work. Harriet Zuckerman's book *Scientific Elite: Nobel Laureates in the United States*,[15] based on interviews with U.S. laureates, is an intriguing analysis of Nobel laureates to date. What the previous research shows, we conclude, is the need for a comprehensive approach, looking at prizes as a field of study. The research field needs to be developed with studies on the significance of prizes, which understand the different perspectives of prize-awarding institutions, prize-winners, the scientific community and the public as a coherent research complex.

The Nobel Prize, in addition to serving as the most influential certification of extraordinary achievement, constitutes a lens through which we can examine some aspects of the scientific enterprise – from the broader role of credit and recognition in academia to the role of science and scientific leaders in contemporary society, or as Jeffrey Flier, former dean of Harvard Medical School, put it: "Though Nobel Prizes inhabit the extreme end of the prize spectrum, and therefore have many unique attributes, Nobel effects ripple like a force field through the broader ecosystem of science, illuminating general principles of scientific credit and warning of potential future problems in this area."[16]

This volume focuses on the most famous (if not notorious) of all prizes in the sciences: the Nobel Prize. These prizes are the ideal example for investigating the mechanisms of scientific recognition (university ranking companies also use them as a parameter). Like no other prize, studying the history of Nobel Prizes reveals the impact prizes can have on the scientific practice and can furthermore help to unravel insights in the public understanding of science. How do Nobel Prize laureates use their position both within the scientific community and as public figures to fashion a certain image of themselves?[17] And what does that say about the public understanding and appreciation of science? The discussions in this volume on the narrative on the geniuses or heroes of science, which has largely underpinned the public perception of Nobel Prize laureates, provide a contribution to the historiography on scholarly personae that has been developed in recent years.[18] Our exploration is based on several examples from Europe in general and from the Netherlands in particular, a country which received relatively many Nobel Prizes during the first decades of their existence and therefore forms an interesting case for exploring social aspects connected to it.

Introducing the chapters

The contributions in this volume focus on the role of Nobel Prizes in Dutch and western history of medicine and science. With this varied collection we aim to explore and delineate the field of "prize studies" in history of science. So far, our understanding of how Nobel Prizes and other major awards in the sciences have been used as a symbol for excellence has remained poor. Whereas historians dedicated themselves increasingly to social aspects of science and marginalized groups, historical interest in Nobel Prizes, together with the demise of "old-fashioned" great-man historiography, apparently have been largely disappearing.

The papers form a rich diversity of contributions that all address one or more of the topics mentioned above, and further our understanding of social aspects of science. They critically discuss ideas of authority, impact and scientific heroism in general, and relate to the social organization of the sciences, to originality, feelings, and creativity in medicine.

Källstrand traces the roots of the hero-of-science-narrative in his chapter and offers a discussion on the relevance of the Nobel Prize based on the effect that controversial choices and controversial Nobel laureates have had on the prize status. Throughout the twentieth century, Källstrand notes, the high status of the Nobel Prize has prevented controversies doing harm to the prize. He argues, however, that this is changing. The status depended to a high degree on the cultural status of celebrating "great men" for their discoveries – and this status has come increasingly under scrutiny over the last few decades. Thus, rather than individual decisions or laureates being seen as inappropriate, it is the underrepresentation of women that can undermine the prize's status.

In their chapter, Ad Maas and Louise Lagarde regard the public perception of Nobel Prize laureates through the lens of artefacts connected to Nobel Prize laureates in a museum collection, that is, that of Rijksmuseum Boerhaave, the Dutch National Museum of the History of Science and Medicine in the Netherlands, which opened its doors in 1931. For a long time, as Maas and Lagarde detail, the way these objects were presented was in line with a somewhat romantic heroes-of-science-image that was common in academic circles, where Nobel Prize laureates were regarded with reverence. Keeping and displaying their artefacts as "relics" – a word the first museum-director used – was part of this veneration. From the 1970s onwards this view was replaced by a more detached and intellectualistic approach in which the focus came on scientific instruments.

The "heroes" of the Leiden Museum had always been regarded as brilliant scientists who were *also* Nobel Prize laureates. Only after the turn of the century, did the Nobel Prize come to the fore, and were the scientists presented as such, Nobel laureates, in the first place. In this era of mass-communication and marketing,

"Nobel" proved to be a perfect "brand" to present the scientists to broader audiences. In recent years, Maas and Lagarde conclude, the call for more "diversity" and "inclusivity" in museums has posed a new challenge to presenting the Dutch Nobel Prize laureates, all white males, in a suitable manner.

The way Nobel Prize laureates have been presented in literature is strikingly different from that in museums, Daniela Link's chapter reveals. Link engages with the representation of Nobel Prizes and Nobel Prize laureates as motifs in literature. Also in the novels she addresses, the genius-narrative plays a significant role, albeit often in a perverted way: rather than as altruistic benefactors of mankind the protagonists of the books in question appear as egocentric and calculating (if not cynical) personas full of personal shortcomings: "The Nobel-biotope in (especially recent) literature," Link writes, "is inhabited with neurodivergent figures, the solitary and socially deviant geniuses." In literature, the lofty Nobel Prize then often acts as a foil to express the human deficiencies of the main characters.

"The literary genius of science," Link explains, "draws on the archetypal hero, who behaves as symbol of morally good action and savior in distress," with a willingness to self-sacrifice. Characteristically, this literary hero is inclined to follow his own path to achieve his goal: "Non-conformism and dissociation can thus be identified as signs of heroism." This specific trait of the hero as outsider got a distinct manifestation in the persona of the genius around 1900, when the burgeoning mass-society informed a longing for individuals who elevated themselves figuratively above the masses. But the genius as eccentric loner also gave rise to the persona of the power-hungry, mad genius, and it is this guise that has particulary resonated in literature.

Midway through the twentieth century, Annelie Drakman shows in her chapter, a variant of the genius-image emerged that emphasized playfulness and fun as scientific virtues. Up to this point, why one pursued science had primarily been motivated either by its practical usefulness or by the engendering of awe and wonder. But, after World War II, scientists began speaking publicly and emphatically of their own enjoyment of science. Why did it become acceptable to say that one did science for the fun of it? To answer this question, self-depictions by two of the most influential public intellectuals of the time are investigated: Richard Feynman (Nobel laureate in Physics, 1965) and James Watson (Nobel laureate in Physiology or Medicine, 1962). Drakman argues that depicting oneself as having fun was a way of displaying vitality, by means of showing off characteristics and traits such as impulsivity, charm, creativity.

Whereas the image of the hero-of-science prevailed in the public perception almost unabatedly throughout the twentieth century, it was dismantled in professional circles of philosophers, sociologists and historians of science. Jelmer Heeren in his chapter details this demise by using the work of the prominent

Dutch historian of science Reijer Hooykaas as a case study. Heeren sets out that, when Hooykaas started his career in the 1920s, the hero-of-science-narrative was underpinned by the then dominant, positivistic "Whiggish" view on the past. This approach divided the history of science in scientifically open-minded observers, the "heroes" who contributed knowledge we now know to be true, on the one hand, and superstitious and dogmatic speculators who had it wrong, on the other.

Hooykaas belonged to the first generation of historians of science to dismiss this positivistic narrative. Already in the 1930s, he downplayed the alleged revolutionary nature of the work of Antoine Lavoisier, the towering figure in the history of chemistry. It was, according to Hooykaas, the "humble" task of the historian to regard historical actors in the intellectual context of their time rather than singling them out as isolated geniuses. Hooykaas predated the work of post-positivists like Thomas Kuhn, but disagreed with historians of science who dismissed the singular role of the individual scientist altogether.

All the papers in this volume so far bear witness to the huge public appeal of the Nobel Prizes. In his chapter on Emil Behring, the first Nobel Prize laureate in Physiology or Medicine, however, Christiaan Engberts addresses a case of a Nobel Prize that instead scarcely evoked any response. His biographers at best mentioned it as a minor footnote in his career. Engberts dismisses the argument that, in the early days, when Behring got his prize, the Nobel Prize's standing had yet to be established. He instead points to circumstances both in the professional sphere and in the public perception of Behring's work that contributed to the silence surrounding his Nobel Prize.

As to the first, Engberts sets out that maintaining cordial relations with his peers in Germany, did not belong to Behring's strongest qualities, to say the least. After alienating himself from his colleagues with his bellicose nature, they were not really inclined to put him on a pedestal at the occasion of his Nobel Prize. In striking contrast to his reputation among his colleagues was his enormous status in the public domain, where the inventor of the life-saving serum against diphtheria was hailed as "the benefactor of humanity" and "the savior of children." Engberts claims that the Nobel Prize simply had little to add to Behring's "already stellar reputation" as a civic hero. Behring's reputation, in sum, was too low within, and too high outside academic circles. "Apparently," Engberts concludes, "public and academic ideals of good scholarship did not overlap entirely."

Such academic ideals of good scholarship are further elaborated in the subsequent chapters, in which Nobel Prizes serve particularly to expose social dynamics within the scientific community. Thus, Rob van den Berg expands on the seemingly remarkable decision of the Nobel Committee to grant the Nobel Prize for Physiology or Medicine in 1929 to Christiaan Eijkman, for his contribution to the discovery of what we now call Vitamin B1. After all, Eijkman himself had opposed the correct

interpretation for his own experimental results for more than three decades. His former assistant Gerrit Grijns, by contrast, was the very first scientist to point to the "partial hunger" resulting from vitamin deficiency, but his work was largely ignored, both by the Nobel Committee and by Eijkman. Van den Berg's case clearly shows the downside to picking out individuals to be rewarded for the scientific achievement in which many researchers have in fact been involved. Having a status within the scientific community and having access to the right communication-channels then become pivotal to getting the credits one does or does not deserve.

The article by Daniela Angetter deals with the knowledge transfer between the Nobel laureates Konrad Lorenz and Nikolaas Tinbergen. Both have had a significant impact on studies of instinctive behavior in very different ways. However, their different ways of working could be perfectly combined. The article also sheds new light on the general differences and similarities between the researchers, especially regarding their social, scientific, and ethnic backgrounds, for example, in relation to the Second World War and the Nazi regime.

Drawing on nominations gathered in Nobel Prize archives for medicine and for peace, the two final contributions argue that Nobel Prize nominations are unique sources to reconstruct how excellence was defined for individual scholars during the first half of the twentieth century. The first by Nils Hansson, Giacomo Padrini, Andreas Winkelmann and Mathias Schütz pinpoints German anatomists as Nobel Prize candidates. Focusing on Albert von Kölliker, Hans Spemann and Wolfgang Bargmann as examples, they shed light on the reasons for how the trio was portrayed by their nominators, why Kölliker and Bargmann were turned down by the Nobel Committee in Stockholm, and why Spemann's nominators succeeded in convincing the jury in 1935. A review of the Nobel Committee evaluations shows that Kölliker's work was deemed too old, and, in Bargmann's case, other nominated candidates were viewed as more important. The examples of Kölliker, Bargmann, and Spemann shed light on the development of anatomy as a scientific field and its contribution to medical knowledge and practice, as considered by the Nobel Committee. In the final piece, Leander Scheel and Nils Hansson show that physicians were not only nominated for the "Physiology or Medicine" Nobel Prize category. They focus on doctors who were nominated for the peace prize and reconstruct the nomination careers of Louis Lazare Zamenhof, Josué Apolônio de Castro, and Albert Schweitzer.

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Notes

1 Katarina Nordqvist and Pauline Mattsson, "Nobel Prize Awarded Discoveries and Commercialization: The Role of the Laureates," in *Attributing Excellence in Medicine: The History of the Nobel Prize*, edited by Nils Hansson *et al.* (Leiden: Brill, 2019), 188–206.

2 Arturo Casadevall and Ferric C. Fang, "Is the Nobel Prize Good for Science?" *FASEB J.* 12 (2013), 4682–4690.

3 Pierre Bourdieu, *Les règles de l'art. Genèse et structure du champ littéraire* (Paris: Seuil, 1992).

4 Gisele Sapiro, "The Symbolic Economy of the Nobel Prize in Literature: How it Counters or Reproduces Modes of Domination," *Poetics* 101 (2023), 101823.

5 Sometimes the "genius" or "hero" of science are used as synonyms, but some of the papers treat them as separate entities and investigate their mutual relationship. See in particular the chapter by Link.

6 Olof Hallonsten, "Introduction to Special Section: Causes and Consequences of the Current Evaluation Regime in (Academic) Science," *Social Science Information* 4(61), (2023) online first, https://doi.org/10.1177/05390184231151610.

7 Richard Münch, *Die akademische Elite* (Frankfurt am Main: Suhrkamp, 2007).

8 Nils Hansson, *Wie man keinen Nobelpreis gewinnt – Die verkannten Genies der Medizingeschichte* (München: Gräfe & Unzer, 2023).

9 Ulrich Bröckling, *Postheroische Helden. Ein Zeitbild* (Berlin: Suhrkamp, 2020).

10 "Beyond the Nobel Prize: Scientific Recognition and Awards in North America since 1900," special issue edited by Nils Hansson and Thomas Schlich, *Notes & Records: The Royal Society Journal of the History of Science* (2024), online first, https://doi.org/10.1098/rsnr.2022.0015.

11 *Historical Studies in the Nobel Archives: The Prizes in Science and Medicine*, edited by Elisabeth Crawford (Tokyo: Universal Academy Press, 2002).

12 Yifang Ma and Brian Uzzi, "Scientific Prize Network Predicts who Pushes the Boundaries of Science," *Proceedings of the National Academy of Sciences USA* 115(50) (2018), 12608-12615.

13 Lokman I. Meho, "The Gender Gap in Highly Prestigious International Research Awards, 2001–2020," *Quantitative Science Studies* 2(2021), 976–989.

14 George J. Borjas and Kirk B. Doran, "Prizes and Productivity: How Winning the Fields Medal Affects Scientific Output," *Journal of Human Resources* 50 (2015), 728–758.

15 Harriet Zuckerman, *Scientific Elite: Nobel Laureates in the United States* (New Brunswick: Transaction Publishers, 1995).

16 Jeffrey S. Flier, "Foreword," in *Attributing Excellence in Medicine: The History of the Nobel Prize*, edited by Nils Hansson, Thorsten Halling and Heiner Fangerau, IX–XI (Leiden: Brill, 2019).

17 "The Consecrating Power of the Nobel Prize in the Global Literary Field," edited by Jørgen Sneis and Carlos Spoerhase, *Poetics* 101 (2023), 101821.

18 See, for instance: *Epistemic Virtues in the Humanities and the Sciences*, edited by Herman Paul and Jeroen van Dongen (Boston: Springer, 2017); Herman Paul, "What is a Scholarly Persona? Ten Theses on Virtues, Skills, and Desires," *History and Theory* 53 (2014), 348–371; Lorraine Daston and H. Otto Sibum, "Introduction: Scientific Personae and Their Histories," *Science in Context* 16 (2003), 1–8.

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