

The Abel Prize—The Missing Nobel in Mathematics?

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By the spring of 2001, the lobbying to establish a prize in mathematics in memory of the Norwegian mathematician Niels Henrik Abel (1802–1829) was well underway. On May 10, Professor Arnfinn Laudal from the Department of Mathematics at the University of Oslo sent an e-mail to the president of the International Mathematical Union, Jacob Palis. Laudal described a campaign that was recently launched by some activists in the department to establish a prize in mathematics. They hoped it would persuade the international mathematical community and Norwegian politicians “. . . to present the Abel Prize as the ‘missing Nobel Prize’ in mathematics”.¹

Until quite recently, no mathematician had suggested that the time was right to establish a scientific prize in mathematics comparable to the various Nobel Prizes. It is true that there existed several international prizes in mathematics, but the obvious absence of a prize that could be compared with the most prestigious prizes in physics, chemistry and medicine had been a source of frustration among mathematicians ever since the Nobel Prizes were first awarded in 1901. The mathematical community had apparently learned to live with this frustration, but when the initiative to establish a prize in mathematics on the same level as the Nobel was suddenly introduced from the mathematical periphery of Norway, it was a wakeup call that resonated with mathematicians. The initiative would in a short time gain support, not only among Norwegian mathematicians, but also in the international mathematical community as well as from influential sectors of Norwegian society. Only after a few months of the campaign being launched in the spring of 2001, the Norwegian government decided to set aside NOK 200 million (approximately USD 35 million)

¹E-mail from Professor Arnfinn Laudal, Department of Mathematics, University of Oslo to the president of IMU Jacob Palis, 10.5.2001. Nils Voje Johansen’s private archive, file “Abel-pris” (hereafter NVJ).

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of the rapidly increasing national petroleum fund to establish the Niels Henrik Abel Memorial Fund, and in June 2003 King Harald V presented the first Abel Prize of NOK 6 million to Jean-Pierre Serre—one of the most influential mathematicians of the twentieth century—during a solemn ceremony in the university assembly hall in an Abel-celebrating Oslo city center in full spring blossom.

The successful campaign was based on the mobilization of both the Norwegian history of mathematics and the history of the dissolution of the political union between Sweden and Norway in 1905. This mobilization was presented to the international mathematical community, which had waited for one hundred years for a scientific prize at the highest level, and to the Norwegian political community, who for several years had expressed increasing concerns at the lack of interest and competence in the natural science arena throughout the entire national schooling and higher education systems. The way in which this was done might explain why the campaign was well received by both the vast majority of the international mathematical community and Norway's politicians, but it might also explain why it seriously irritated the Swedish Nobel Foundation.

In this article, I hope to shed light on the dynamics of the history of the intensive campaign that led to the establishment of the Abel Prize in 2002. This investigation also leads to more tentative considerations regarding to what degree the prize has lived up to the high expectations placed on it during the first decade of its existence.

1 Science Prizes in Historical Perspective

Historians and sociologists of science have long noted the rich variety and changing nature of prizes in the world of science. Although national academies of science might occasionally award prizes to foreigners, the notion of a truly international prize first emerged with the establishment at the turn of the twentieth century of the Nobel prizes [3, 5]. Although Swedish and Norwegian national institutions would be responsible for awarding the various prizes, Alfred Nobel's testament underscored that they should be awarded based on merit whether or not the candidates were Scandinavian or not. This clearly stated goal, as well as the implementation a system of nomination of candidates that at the time was unprecedented in its international scope, reinforced the assumption of a prize that could serve as a so-called level playing field on which the so-called civilized nations of the world could compete peacefully to prove their cultural strength and vitality [5, 6, pp. 158–162]. Although the prize committees remained national, and although recent historical studies have demonstrated a range of biases that have entered into deliberations on awarding prizes, the will to believe in a truly impartial international prize, from the very start in 1901, tended to slow down criticism and skepticism. National scientific communities and competing elite institutions within a country generally understood the importance of international recognition as a resource for local prestige and benefits [6].

The emergence and rapid acceptance of international prizes by significant national scientific communities occurred at a time when internationalism blossomed

in academic cultures. The rise during the 19th century of international organizations and international commissions for science not only fomented their supposed missions of the advancement of knowledge through facilitating communication and collaboration, they also enabled national scientific leaders to appeal locally for funds and authority based on their international activities and recognition. Appeals to the trans-national republic of letters to gain prestige in local cultural politics was nothing new, but seemingly such tendencies grew in intensity starting in the late nineteenth century and interrupted only occasionally during the First World War [6].

During the last quarter of the 20th century the number of international prizes in science really started to proliferate. Wealthy patrons of culture gladly donated fortunes to endow prizes that would carry their name in the name of advancing and stimulating science. Several such prizes attempted to outdo the Nobels in the amount of money to be awarded; some clearly aimed to bring prestige to the nation awarding the prizes. Universities and state ministries for research and higher education gladly turned to such alleged measures of excellence in their efforts to support national science [16].

The cult of excellence, as defined by prizes and awards, was largely a feature of American science and academia for much of the 20th century. Especially during the last two decades of the century, it spread to Europe and Asia. Although this phenomenon has been noted, its causes seem complex and not fully explored. New management thinking, an emerging global economy of higher education and research, higher costs for doing research and universities confronting post-Cold War reductions of state-funding of science seem to be some of the most obvious factors. Similarly the rise of global media coverage such as CNN, BBC World etc. helped transform the awarding of enormously huge prizes and award ceremonies into news events to an even greater extent than previously. Some of the prizes has thus become potentially much more powerful marketing tools for both institutions and nations alike in an ever more fierce competition for status, prestige and funds in the academic world.

The Abel prize plans were introduced in the context of this increasingly overheated culture and economy of international prizes in science. And the eventual birth of a major international prize for mathematics in a nation not normally considered a major player in international science was marked by multiple intentions and motivations, and what might be seen as pure luck. The story of how the Abel prize came about is a story of tight networks of contacts among academics, politicians, bureaucrats and industrial leaders in a small nation. It is at once both a piece of contemporary national history, offering a preliminary glimpse behind the scenes of how things might happen in a small and wealthy nation, as well as an account of how cultural heritage can be recruited as a resource for science policy: Here one of Norway's legendary highly-gifted mathematicians would be recruited for a wide spectrum of cultural-political purposes from differing constituencies with a variety of interests some 170 years after his death.

The article is based on a variety of sources: Private archives—to a large extent e-mail archives, project drafts and personal notes—from the central mathematicians involved in the process, interviews with relevant mathematicians, bureaucrats and

politicians, Norwegian and international newspaper articles and magazines and primary sources from the Norwegian Ministry of Education and Research and the Norwegian Academy of Science and Letters. Most of the key actors in the Norwegian mathematical community seem to have been quite aware that the process might be of interest for historians in the future, and most of them have kept personal—and often overlapping—archives and notes almost in the wait of an historian knocking on their door. These archives have provided not only a very rich mosaic of primary sources, but also glimpses from different angles into the most important contacts with Norwegian politicians and bureaucrats as well as with international mathematical communities during the process. Seen together with the rest of the source material—especially documents and official records from the Ministry of Education and Research—these personal archives have proven most valuable for the study. Problems related to the study of contemporary science, including the challenges of source materials are further discussed in many of the essays in *The Historiography of Contemporary Science, Technology, and Medicine: Writing Recent Science* [4].

2 A National Icon

During the nineteenth century, Niels Henrik Abel became an important part of the Norwegian national narrative of the country's unique history and cultural identity, a narrative that became ever more important in the years leading up to the dissolution of the political union with Sweden in 1905. At the centennial of his birth in 1902, and three years before the break from Sweden, Abel was celebrated as a national hero in the Norwegian capital Christiania (renamed Oslo in 1925). In a letter to the Norwegian 1903 Nobel Prize in Literature laureate Bjørnstjerne Bjørnson, the scientist, polar hero and later Nobel Peace Prize laureate Fridtjof Nansen wrote as chairman of the Abel celebrations, "For me it stands as a duty to make the most of an event like the birth of Abel in our nation; by holding this up for the rest of the world, we prove our right to exist as an independent state" [10, p. 5].

The celebration was the perfect occasion to display the desire for national independence. When the Swedish and Norwegian king, Oscar II, invited 500 guests to supper at the Royal Palace, the students at the Royal Frederick University—later the University of Oslo—seized the opportunity and arranged the greatest torchlight parade ever seen in the city. The university invited mathematicians from all over the world and appointed numerous honorary doctors. A memorial publication was published in both Norwegian and French, and the National Theater put on a celebratory performance of the Norwegian play *Peer Gynt* by Henrik Ibsen (now the most well-known Norwegian play), followed by the national anthem sung by the entire auditorium [7]. A competition was also called to create an Abel memorial monument. Six years later—and three years after the dissolution of the political union with Sweden—a pedestaled monument by Gustav Vigeland nearly forty feet high was erected in the Royal Gardens (in what later came to be known as Abelhaugen) close to the university buildings.

It is in no doubt that Abel played an important role as a symbol of Norway's growth as an independent nation from the beginning of the twentieth century. He was perhaps most important as an academic ideal in a period when the natural sciences especially received both scientific and economic importance and prestige in Norway [12]. On the centenary of Abel's death in 1929, a series of Abel stamps were issued—an honor previously only given to royalty and Henrik Ibsen—and again international honorary doctors were appointed at the university. Abel's portrait was also printed on the Norwegian 500 kroner bill between 1948 and 1991, and many Norwegian cities and towns have streets and squares named after him. In 1966 the mathematicians at the University of Oslo, where Abel himself was a student from 1821 to 1825, moved into the new Niels Henrik Abel building at the modern Blindern campus on the western outskirts of the city center.

Abel's name was once again brought to the forefront in the late 1990s as part of plans for two major international mathematical events in Norway. The Abel bicentennial in 2002 was approaching while the International Mathematical Union (IMU) made preparations for the International Congress of Mathematicians to be held the same year. The IMU leadership was aware that China would apply to host the world congress, but the international union feared that such an event would be a highly controversial or even impossible because of China's human rights situation. In 1995, a professor of mathematics at the University of Oslo, Jens Erik Fenstad, shared a seat with the then IMU secretary and later IMU president Jacob Palis on the executive board of the International Council of Scientific Unions. Palis asked Fenstad if it was possible for Norway as both a politically and mathematically uncontroversial nation to prepare a back-up application to host the 2002 IMU International Congress of Mathematicians as a plan B if it proved politically unattainable to proceed with the original plan to hold the congress in Beijing.²

In a relatively short time, it became clear that the IMU plans were going ahead as scheduled, and that China would host the 2002 congress. The Norwegian preparations for a back-up plan, which had been started shortly after Palis' request, were soon transformed into plans for a major international mathematical conference in memory of Abel. A working committee of five mathematicians from the University of Oslo and the Norwegian University of Science and Technology in Trondheim was put in place and given the task to make appropriate preparations for a "*Niels Henrik Abel Bicentennial Conference*" in Oslo in the spring of 2002. This committee also made preparations for Norway's role in the World Mathematical Year 2000. Even though Abel's name and history was prominent in the preparations for both these events, it never occurred to anybody in the Norwegian mathematical community that these occasions could be used to advocate the creation of an international prize in mathematics in memory of Abel. One hundred years earlier, major efforts had been made to do so when Norwegian mathematicians had launched an extensive campaign to establish a prize as part of the Abel centennial celebrations in 1902.

²Jens Erik Fenstad, undated and unpublished, "3.4 Abelåret og Abelprisen" in "*Noen notater om matematikken etter annen verdenskrig*", in Jens Erik Fenstad's private archive (hereafter JEF).

3 The Initiative

The new initiative to create a prize in memory of Abel was presented from a different angle by the author and poet Arild Stubhaug. Stubhaug had published several poetry collections, but he had also studied mathematics at the University of Bergen. As a passionate stamp collector, Stubhaug was from an early age acquainted with and fascinated by Abel's life. Abel had died at the age of 26, only two days before the Frederick William University in Berlin—later known as Humboldt University—was to offer him the tenured position as professor he needed to be able to fully concentrate on his mathematical work. Abel also died convinced that his main work, the so-called Parisian manuscript, was lost forever. The same day as the letter was posted offering him the professorate in Berlin, the manuscript was found in Paris. More than anything this work laid the foundation for Abel's posthumous fame and acknowledgment both in Norway and in the international mathematical community [9, 14].

Arild Stubhaug had for a long time wanted to write about Abel. From the early 1980s he lived in Arendal, close to Gjerstad where Abel spent his childhood years, and not far from Froland where the mathematician died. In 1988 Stubhaug was encouraged by the publishing house Aschehoug to go forward with his plans. The research and writing took him eight years and resulted in the critically acclaimed biography *Et foranskutt lyn* (the English version, *Called Too Soon by Flames Afar: Niels Henrik Abel and His Times*, was published in 2000). The response of the Norwegian daily newspapers was close to panegyric and wrote of a “biographical masterpiece” and a “first class cultural biography”.³ The Notices of the American Mathematical Society several years later, when the book had been translated into English, wrote of “a great contribution to our knowledge of Abel and his time”.⁴ The research and the positive reception of the book brought Stubhaug in close contact with the Norwegian mathematical community in general, particularly with mathematicians at the University of Oslo. Shortly after the release of the Abel biography, the mathematicians in Oslo encouraged him to write a biography about a further great nineteenth century Norwegian mathematician, Sophus Lie (1842–1899). In 1997 Stubhaug got his own office next to the Oslo mathematicians in the Niels Henrik Abel building on Blindern campus.

During his work on the two biographies, Stubhaug collected a great deal of material detailing how Sophus Lie dedicated a good part of the last years of his life to establishing an international mathematical prize in acknowledgment of Abel. Lie's work was clearly inspired by the grand Nobel prize plans presented in 1897. Those plans did not include any prize in mathematics because Nobel first and foremost wanted to encourage the practical outcomes of science and technology, and found

³VG—24.9.1996 “Biografi-bragd”, *Aftenposten*—24.9.1996, “Storslått Abel-biografi”, *Dagbladet*—30.9.1996, “Kultur-biografi av ypperste rang”.

⁴Book review by Jesper Lützen, “Called Too Soon by Flames Afar: Niels Henrik Abel and His Times”, in *Notices of the American Mathematical Society*, August 2002 Volume 49 Issue 7.

the mathematical world far too theoretical and abstract. Sophus Lie received much support for his plans from the leading mathematical circles in Europe.

International support for the award was closely connected to Lie personally, and it essentially dwindled away after his death in 1899. Efforts to create an Abel Prize were now carried along within a national framework. In close cooperation with some of Lie's colleagues, the Scientific Society of Christiania (now the Norwegian Academy of Science and Letters), represented by W.C. Brøgger—the future rector of the university—and Fridtjof Nansen, developed statutes and rules for an Abel Prize in mathematics. The prize of a gold medal worth 1000 kroner was to be awarded every fifth year for “outstanding work within pure mathematics”. The Nobel medals were at this time worth 500 kroner and awarded annually [10, pp. 6–8].

The Brøgger/Nansen initiative was financially supported by the king of Sweden and Norway, Oscar II, who took a personal interest in mathematics, and it was applauded by leading Norwegian mathematicians and cultural personalities. However, after the dissolution of the political union between the two countries in 1905, the Norwegian Academy was not able to collect the necessary funds to finance the prize in the relatively poor, independent Norway. The dissolution of the union was eventually peaceful, even though some days in September 1905 saw tens of thousands of troops lined up on both sides of the border. It was nevertheless financial constraints and not resentment against the Swedes that made it impossible to go on with the prize plans after the separation. W.C. Brøgger was by far the most influential organizational entrepreneur in Norwegian science in the first decades of the 20th century, and he was above all a great admirer of Swedish science and Swedish scientific institutions. Almost all of Brøgger's influential institutional work within Norwegian science in the first three decades of the 20th century was in fact modeled after Swedish ideals on how to provide ever more substantial funding for science and scientific institutions [2, pp. 19–22]. It was a great disappointment for a resigned Norwegian mathematical and scientific community that the money for a prestigious Norwegian prize in mathematics disappeared with the dissolution of the union with Sweden. Fridtjof Nansen wrote: “the Abel Prize that we had been promised by good King Oscar went to heaven with the union” [10, pp. 6–8].

Arild Stubhaug gave many lectures in the years following the publication of his biography on Abel. Time and again he told of the plans to establish an Abel Prize around the 1902 centennial, and time and again he told of how the plans were aborted with the death of the mathematician Sophus Lie and the dissolution of the union with Sweden. Stubhaug frequently asked, would one hundred years later not be the perfect opportunity to revitalize these plans and finally create a prize in memory of Abel? He aired his thoughts among a great number of Norwegian mathematicians, but even though several found the history and the idea interesting, the general attitude in the mathematical community was that an Abel Prize was, in Stubhaug's words, “extremely unrealistic” [13, p. 5].

Stubhaug's efforts to bring the idea of an Abel Prize back to life seemed to amount to nothing when suddenly things brightened up in the summer of 2000, nearly four years after the publication of the biography. The book had now been translated into English, and on July 1, Stubhaug was invited to a bookstore in the

small coastal town of Risør, close to where Abel both grew up and died, to sign books on the final day of a yearly chamber music festival. Every year this festival attracts many tourists and potential customers to town. Abel's mother grew up in Risør in a house close to the store, and the owner had arranged for the translated biography to be sent by courier in time for the festival. Thus, the bookstore in the small harbor town of Risør became the first to sell the English edition of the Abel biography.⁵

When Stubhaug turned up at the bookstore, a few minutes late, he met the CEO of Telenor (a Norwegian telecommunications company) Tormod Hermansen on his way out the door with a copy of the Abel biography under his arm. Towards the end of the 1990s, the prominent Labour Party politician and industrial leader Hermansen was characterized as both "the most powerful bureaucrat in Norway" and "Norway's most powerful man" [15]. He was primarily known as one of the most influential architects of the far-reaching and controversial public sector reforms of the past couple of decades, heavily inspired by the principles of New Public Management. Hermansen had held different key positions in the state bureaucracy since the early 1970s, and as Under-secretary of State he led a profound reorganization of the Ministry of Finance towards the end of the 1980s. As chairman of the Government Bank Insurance Fund he was in charge of the rescue plan for private banks during the Norwegian bank crisis in the early 1990s, and had been CEO of Telenor (the former state-owned telephone monopoly Televerket) since 1995 [15].

Stubhaug and Hermansen were not previously known to each other, but they sat down to talk in the bookstore. During the conversation Stubhaug told Hermansen about the failed attempts to create an Abel Prize one hundred years earlier. As on numerous occasions during his lectures about the Abel biography, he made sure again to mention that the forthcoming bicentennial celebrations provided a new opportunity for such an award. According to Stubhaug, Hermansen took special notice of how the dissolution of the union between Sweden and Norway in 1905 had halted the plans for an Abel Prize.⁶ As CEO of Telenor, Hermansen had his own and very recent experiences on how relations with Norway's Swedish neighbors could put an end to grand-scale plans. At the time of the meeting with Stubhaug, Hermansen had just finished protracted and failed negotiations regarding a merger between Telenor and the Swedish telecommunication giant Telia. This had been one of the most contested and controversial political issues in both countries in the past two years. After fierce political, administrative and personal struggles for power, the two companies broke an already signed merger deal. Hermansen took much of the blame for the failure [15]. The relationship with the Swedes should not also end the plans for an Abel Prize, and the Telenor CEO promised Stubhaug that he would do everything he could to grab this new opportunity. The two separated with mutual assurances that they would promote the cause with a new strength, Hermansen through his po-

⁵Interview with Arild Stubhaug, 7.2.2012. Telephone interview with Torkjel Gudmund Johansen, owner of Risør Bokhandel, 9.2.2012.

⁶Interview with Arild Stubhaug, 7.2.2012.

litical contacts and Stubhaug through the mathematicians at the University of Oslo [13, p. 5].

4 Mobilization

Shortly after the meeting in Risør, Stubhaug made his colleagues in the Department of Mathematics at the university aware of the new development. The department immediately got in contact with Hermansen. Together with Stubhaug, the head of department and head of office “looked into what had to be done to create a powerful prize with international recognition”. There “was no Nobel Prize in mathematics”. Abel “was a world known name that enjoyed the highest scientific recognition”, and the department suggested that the establishment of a prize in Abel’s name was something that Telenor might take interest in as part of their internationalization strategies.⁷

However, Tormod Hermansen did not envision Telenor as a sponsor of an Abel Prize. This was a matter of national importance that had to be presented to the Labour Party government. In early September 2000, Hermansen called the Minister of Education and Research, Trond Giske, and some days later the Telenor CEO sent the Minister a letter regarding “the Abel Prize”. In the letter Hermansen expressed his hopes that Giske would get people truly excited about the idea. The enclosed memorandum from the Department of Mathematics stated that Abel’s name was among the very greatest in “the history of mathematical-technical science”. An Abel Prize would “highlight a research area that is at the core of all scientific progress, and as such it would create both attention and respect for Norway all around the world”.⁸

The Ministry did nothing about Hermansen’s initiative during the fall and winter of 2000–2001. The pessimists seemed to be proven the most realistic; there was no obvious reason to believe that there would be a break-through to establish an Abel Prize one hundred years after it “went to heaven with the union” with Sweden. Stubhaug tried to call Hermansen several times, but was only able to speak to his secretary, who had no new information.⁹

Therefore, it came totally out of the blue when Hermansen called Stubhaug early in the morning on March 12, 2001, and said that they had to immediately set up a meeting with the mathematicians in Oslo. Hermansen had been involved in some promising talks with possible key political actors regarding establishing a mathematical prize. Not only had he spoken to the Minister of Education and Research,

⁷“Opprettelse av Abelpris”, letter from the head of department Arne Bang Huseby and the head of office Yngvar Reichelt in the Department of Mathematics to Telenor CEO Tormod Hermansen, 22.8.2000, NVJ.

⁸Letter from Tormod Hermansen to the Minister of Education and Research, Trond Giske, 7.9.2000. Ministry of Education and Research archive (hereafter KD): Saksnr. 00/7309, FO./ESO, Archive code 757, “Abelprisen i matematikk, Niels Henrik Abels minnefond”.

⁹Interview with Arild Stubhaug 7.2.2012.

he had also been in contact with the Prime Minister's office, and he had received positive signals from the experienced Under-secretaries of State in both the Ministry of Education and Research and in the Ministry of Finance.¹⁰

As noted above, a national committee had been set up in the late 1990s to prepare the program for the Abel bicentennial celebrations as well as the academic program for the international "Niels Henrik Abel Bicentennial Conference" in 2002. The Ministry of Education and Research contacted the leader of this committee, the mathematician Jens Erik Fenstad at the University of Oslo. In 1995 Fenstad was asked by the later president of IMU, Jacob Palis, to design a Norwegian alternative for the 2002 International Congress of Mathematicians, and in doing so Fenstad cooperated closely with the Ministry of Education and Research. The Ministry now apparently believed that it was the National Abel Bicentennial Committee that had come up with the initiative to create an Abel Prize as part of the 2002 celebrations. However, the national committee knew nothing of any such plans. The few involved at the Department of Mathematics at the University of Oslo had not deemed it necessary to inform the national committee in the early stages of the process, and as autumn passed and winter came without any new information or developments, the department members lost interest in the project and the issue was nearly forgotten.¹¹

Up until March 2001, there were only a handful of people in the mathematical community at the University of Oslo who even knew of the plans for an Abel Prize; this was more than eight months after the biographer Stubhaug met the Telenor CEO Hermansen at the Risør bookstore during the chamber music festival. The future planning of the prize would be carried out by a small group of people at the Department of Mathematics in Oslo, where Stubhaug had his office and closest contacts with the Norwegian mathematical community.

5 The Abel Prize "Working Group"

On March 21, Tormod Hermansen and his Telenor colleague Kjell Stahl met with the Oslo mathematicians on one of the top floors of the Niels Henrik Abel building on Blindern campus. The head of department Arne Bang Huseby, head of office Yngvar Reichelt and university lecturer Nils Voje Johansen had all known of the plans from their inception nearly one year prior. The biographer Arild Stubhaug was of course present. From this date the University of Oslo mathematics professors Arnfinn Laudal, Jens Erik Fenstad and Ragni Piene became fully involved in the process. Laudal was head of the scientific committee for the forthcoming Abel Bicentennial Conference, and both Fenstad and Piene were members of the national committee for the Abel bicentennial celebrations.

¹⁰Jens Erik Fenstad in an e-mail to Trond Fevolden 3.4.2001, JEF. Telephone interview with Tore Eriksen 23.01.2012.

¹¹Interview with Nils Voje Johansen, 16.12.2011.

During the meeting, Tormod Hermansen told of the contacts with the Office of the Prime Minister and the two core ministries, Education and Research and Finance. He made it clear that there was a good chance of success if the government could be persuaded to use the petroleum fund, where surplus profits from Norwegian petroleum income were deposited. By the end of 2000, the fund had reached NOK 386.4 billion (approximately USD 45 billion). He had reason to be optimistic. Two years earlier, the government had used the petroleum fund to establish a research fund of NOK 3 billion, and the profits were allocated to support Norwegian research. With such use of the funds, the Ministry of Finance had deviated from the normal practice to make all public spending visible in the national budget through explicit postings. A similar exception was possible for the Abel Prize. The Undersecretary of State of the Ministry of Finance said in a later interview that he made it explicitly clear to both Hermansen, as well as later contacts concerning the Abel Prize, that the Ministry would not normally encourage such a practice. Nevertheless he also stated that it was a widely held belief in the Ministry of Finance at the time that an Abel Prize could be important in future recruitment, within an academic field that many in the Ministry believed to be of the greatest importance. According to the Undersecretary of State, there existed nothing less than “a genuine enthusiasm for promoting mathematics” within the Ministry. Initially, there was a fear in the Ministry that an Abel Prize might become “a home-made Norwegian prize”, but such concerns gradually diminished as the campaign for the prize proceeded into the spring of 2001.¹²

The meeting with Hermansen made it clear to all those present that it was possible that they would obtain more than anyone had dared to dream. Jens Erik Fenstad stated that the government “could just earmark a sum of money, and leave the profits from the interest to pay for both the award and the arrangement”.¹³ Hermansen’s passion fuelled others; “Hermansen inspired us to aim high”, Nils Voje Johansen voiced and “his enthusiasm rubbed off on us”, wrote Jens Erik Fenstad.¹⁴ Several of those present at this initial meeting tell that they immediately understood the importance of putting aside all potential conflicts and power struggles that often characterize the inner life of academic institutions. There were already more than enough potential time bombs in the room. Only a few years earlier it would have been unthinkable that Hermansen’s colleague Kjell Stahl and Professor Arntfinn Laudal would sit together in the same room peacefully. Laudal had been a central force behind a strong university opposition in 1990 that ended Kjell Stahl’s short career as director at the University of Oslo after the most fierce internal conflict and crisis within the university since WWII. As pro-rector at the time, Jens Erik also played a central role in this conflict [8, pp. 75–79]. Now, however, there were important matters of mutual interest that everybody focused on.

¹²Telephone interview with Tore Eriksen, 23.1.2012.

¹³*Aftenposten*, 28.5.2001, “Ber om 150 mill. til Abel-pris”.

¹⁴“Noen notater . . .” and “Abel-prisen—punkter fra historien”, NVJ. Interview with Yngvar Reichelt, 13.2.2011.

From the very beginning of the work in this group, the Nobel Prizes were established as the “gold standard”. Before the meeting, the Oslo mathematicians had prepared a presentation on the Nobel organization and its budget. During the meeting it was decided that the committee should seek advice from the director of the Norwegian Nobel Institute and the leader of the Norwegian Nobel Committee. It was suggested that a fund of approximately NOK 100–150 million was required to present an award of the same value and prestige as the Nobel Prizes.¹⁵

Before the meeting, Arnfinn Laudal had mentioned the plans to the General Secretary of the Norwegian Academy of Science and Letters. The Academy, which at this time was beginning to regain some strength after decades in decline, was more than willing to take on the task of administrating a scientific prize on a Nobel level [7, pp. 194–198]. As we have seen, the Academy would have also taken care of the Abel Prize if it had been created one hundred years earlier. There was also general agreement that the Academy would provide the prize with a greater national legitimacy than if it was handled by the University of Oslo. The latter option would have most probably started one of the very common and time-consuming Norwegian debates about localization, which might have jeopardized the whole project.

The meeting ended with the creation of an informal “working group” for the Abel Prize in the Department of Mathematics at the University of Oslo. It consisted of biographer Stubhaug, head of office Reichelt, lecturer Voje Johansen and the three professors Laudal, Fenstad and Piene. In the time that followed, the six people in this working group came to run an intense campaign directed towards the international mathematical community and the national public opinion to obtain a political green light for their plans.

6 Scientific Legitimization and Support

The members of the working group tell of an informal and level structure where each was given more or less a defined area of responsibility, and where the development of the work was coordinated via contact by e-mail and in frequent meetings. Partly depending on each member’s personal networks in academic and political circles, and influential echelons of Norwegian society, the working group contacted people in the international mathematical community and those in Norwegian society that would benefit the campaign which was by now really getting underway. The work was proceeding without any major tensions and in an enthusiastic environment. The trustful atmosphere was also most likely strengthened by the fact that the initiative was being met with open arms from almost all arenas.

From the beginning, the working group was assured of full support from the Norwegian Academy of Science and Letters where all three professors of the working

¹⁵Minutes from the meeting with Hermansen 21.3.2001 noted in Ragni Piene’s academic diary. Ragni Piene’s private archive (hereafter RP). Minutes from the meeting with Hermansen 21.3.2001, JEF.

group were members. In just a few weeks after the first request, the working group received the Academy's formal acceptance that the institution would like to take responsibility for the prize.¹⁶ By the end of April 2001, Oslo mathematicians Piene and Laudal contacted the European Mathematical Society (EMS) and IMU to obtain further support for the plans for an Abel Prize from the highest level in European and world mathematics.

Professor Piene wrote to the president and vice-president of EMS, Rolf Jeltsch and Bodil Branner, to tell them that they were now making plans in Norway for a prize in mathematics “comparable to the Nobel Prize in the other sciences”. Piene asked EMS if they wanted to support such an idea, and if so, were they willing to write a letter to confirm “that the name of Niels Henrik Abel is indeed a good, internationally recognized name, worthy to be used for a prize of this magnitude”. She added “in fact, it seems quite realistic, though of course it is yet too soon to say precisely how realistic it is”. Over the duration of the day, many e-mails were sent between Piene, Jeltsch and Branner. Jeltsch got in contact with the EMS executive committee, and stated that he had received an important message from Norway about the establishment of a prestigious prize in mathematics. If he did not receive any objections from the committee, Jeltsch made clear that he was going to write a letter in support of the idea as soon as possible.¹⁷

Later the same day, EMS vice-president Bodil Branner could inform her Norwegian contact that the distinguished American mathematician John H. Hubbard from Cornell University was visiting her. Hubbard is especially known for his studies within complex dynamics, a core field in Abel's works. When Branner told Hubbard about the plans, he immediately wrote a text which—Branner added—“I think is what you need in Norway”. In his letter Hubbard wrote that Abel's ideas—like those of “the very greatest scientists”—“have so permeated mathematics that one is no longer aware where they come from”. According to Hubbard, Abel had “revolutionized the theory of equations, complex analysis, number theory and algebraic geometry”. Abel was “responsible for the deepest work on algebraic integrals of the nineteenth century”, and “the ideas he initiated are still, 170 years later, central to the best of mathematics”. “Abelian groups” are part of the undergraduate vocabulary; “Abelian varieties”, “Abelian integrals” are part of standard topics in graduate courses. The next day Hubbard's panegyric appreciation of Abel was enclosed in a letter of wholehearted support from the president Rolf Jeltsch on behalf of EMS: “It is with great pleasure that I hear that Norway plans to honor its famous Mathematician Niels Henrik Abel by introducing a prestigious prize. I can assure you that the European Mathematical Society is enthusiastically supporting this idea. For us, there is no doubt that his name is worthy to be used for this prize”.¹⁸

¹⁶Ragni Piene to the Norwegian Academy of Science and Letters, 18.4.2001. Final confirmation in mail from the academy to the working group, 20.4.2001. RP and NVJ.

¹⁷Rolf Jeltsch to the EMS executive committee, 18.4. NVJ.

¹⁸President of the EMS Dr. Rolf Jeltsch to Ragni Piene, 19.4.2001. KD: Saksnr. 00/7309, FO./ESO, Archive code 757, “Abelprisen i matematikk, Niels Henrik Abels minnefond”.

Professor Laudal had by now got in contact with the president of IMU, Jacob Palis, who liked the idea very much.¹⁹ IMU already awarded the most prestigious international prize in mathematics, the Fields Medal. The Fields Medal—which history can be traced back to 1924—is awarded every four years during the International Congress of Mathematicians to recognize outstanding mathematical achievement for existing work and for the promise of future achievement to mathematicians under the age of 40. The prize amount was however modest. In 2000 it was well under NOK 100,000 (approximately USD 10,000). IMU did not want a new prize to compete with the Fields Medal, and Laudal assured Palis that the planned Abel Prize would not be comparable to any of the existing IMU prizes. As we saw in the introduction, the prize was therefore also presented as “the ‘missing Nobel Prize’ in mathematics”.

This argument was very well received by IMU, which had for one hundred years been longing for a scientific prize comparable to the Nobel Prizes. This desire is evident in the strength of the stories retold in the international mathematical community, about how Nobel allegedly decided not to establish a prize in mathematics because of quarrels over a woman with the Swedish mathematician Gösta Mittag-Leffler. Even though this story has been proven false, the almost haunting issue of the “missing Nobel in mathematics” has been kept very much alive [11, 13, p. 17]. This might explain why the working group was soon able to present Norwegian politicians and state authorities with overwhelming support for the plans from the world’s leading mathematical organization.

Through President Palis, IMU expressed its “full support to [the] initiative to create the Prize named after Abel, one of the greatest mathematicians of all time”. The mathematical union considered the establishment of an Abel Prize no less than “the most important project in many years for the development of mathematics worldwide”. A prize at this level was very much welcomed and would not interfere with the other IMU prizes such as the Fields Medal or the Nevanlinna Prize. According to IMU leadership, the absence of a prize “similar to the Nobel Prize for Mathematics is a century old one and an ever discussed missing feature of the scientific work of our community”. The creation of the Abel Prize would therefore be most appropriate “to fill such a serious gap”.²⁰

7 Political Lobbying

During May 2001 the working group gathered support from the members of the parliamentary Standing Committee on Education, Research and Church Affairs, and key persons in Norwegian science, culture and public life. One main objective of

¹⁹Jacob Palis to Arnfinn Laudal 1.5.2001, NVJ.

²⁰KD, Saksnr. 00/7309, FO./ESO, Archive code 757, “Abelprisen i matematikk, Niels Henrik Abels minnefond”. (E-mail 19.7.2001. This message was sent in different versions, in both e-mail and letters through the spring and summer of 2001).

the prize was, according to the working group's four-page public presentation, "to create better understanding of the importance of mathematics and science in today's society". Mathematics, it was emphasized, is a broad discipline, ranging from "pure mathematics to a vast number of applications within science, society and technology". The prize would contribute to make these applications more visible to the general public, whether they dealt with understanding ecological systems, the study of financial markets, oil drilling, medical diagnostics or biotechnological development. The working group's presentation also highlighted the Nobel Prizes as the obvious ideal for the new prize, both in organizational and economical terms: "If handled properly, an annual Abel Prize might draw great attention and in time achieve the same status as the Nobel Prizes within the other sciences".²¹

The responses were welcomed and strongly supported the need to make the importance of mathematics much more visible to the general public. This, many of the respondents maintained, was essential to create a much needed interest in mathematics and science, and to improve the poor and declining recruitment numbers in those fields over the past decades. Soon the working group had a list of 29 prominent people supporting the plan. The list included the rectors of all four Norwegian universities, the presidents of the Norwegian Academy of Science and Letters in Oslo and the Royal Norwegian Society of Sciences and Letters in Trondheim, several other professors, a recent Minister of Education and Research and the most influential prime ministers of the past two decades, Kåre Willoch (Conservative Party) and Gro Harlem Brundtland (Labour Party).²²

The then Minister of Education and Research, Trond Giske (Labour Party), was nevertheless somewhat reluctant. The initiative was presented to him and his office several months earlier and nothing had happened. Some days after the first meeting in late March, the working group invited the Minister to meet the group to be "informed and initiate a dialogue [...] about possible solutions".²³ But Minister Giske was still not very enthusiastic, and made it clear that he did not have millions of kroner just lying around. And if he did, he was not at all sure that he would spend them on a mathematics award.²⁴ In contrast, the working group had a "very encouraging meeting" with the Under-secretary of State in Giske's department.²⁵

Towards the end of May, the group seemed somewhat uncertain about what their next move should be: was it strategically wise to proceed with talks with Giske's Ministry or would it be better to head straight for the Office of the Prime Minister?²⁶

²¹Prospectus "Abel-prisen", spring 2001, JEF/NVJ. See also *Aftenposten* 27.6.2001, "Blant de største" by Jens Erik Fenstad.

²²Prospectus "Abel-prisen", spring 2001, JEF/NVJ.

²³Letter from Yngvar Reichelt on behalf of the Abel Prize working group to the Minister of Education and Research Trond Giske, "Abelpris i matematikk", 29.3.2001. Yngvar Reichelt's archive (hereafter YR).

²⁴E-mail from Rolf Reikvam to Arnfinn Laudal, 18.5.2001, NVJ.

²⁵E-mail from Jens Erik Fenstad to Kjell Stahl 27.4.2001, JEF.

²⁶E-mail from Laudal to Reikvam, 16.5.2001, and e-mail from Reikvam to Laudal, 19.5.2001, NVJ.

They chose a broad approach. By the end of May the working group made three parallel moves: (1) they sent a letter to Prime Minister Stoltenberg and asked for a meeting; (2) Professor Laudal got the Socialist Left Party representative in the Standing Committee on Education, Research and Church Affairs—who was very enthusiastic about the plans—to present a formal question in Parliament (Stortinget) to Minister Giske; and (3) Professor Fenstad got full-page coverage in the large national newspaper *Aftenposten*, regarding the possible creation in the near future of a prestigious mathematics award in memory of Abel.²⁷

Together with the letter to the Prime Minister and the news coverage, the formal question asked in Parliament raised the political temperature of the issue.²⁸ In his question, the Socialist Left Party representative first made clear that the prize had to be on level with Nobel Prizes to gain the necessary prestige. He summed up by asking “Will the Minister take action and establish a fund so that the prize can be awarded already next year?”²⁹ Based on the letter to the Prime Minister and the question in Parliament, a state secretary at the Office of the Prime Minister advised Minister Giske to meet with the Abel Prize working group. Even Giske’s own Department of Research now urged the Minister to give Parliament a positive answer, and invite the working group to a follow-up meeting.³⁰

In his answer to Parliament in the beginning of June, Giske stated that he was fully aware of the plans, and that he agreed that “the building up and strengthening of the national competence within mathematics and the natural sciences is needed”. He had also noted that the plans were supported in “important academic circles”. If the government was to establish a fund “that placed a prospective Abel Prize on level with the Nobel Prize”, then the proposal had to “be evaluated together with other measures to strengthen recruitment and improve the scholarly quality of Norwegian mathematics and natural science”. In accordance with the clear political signals from both the Office of the Prime Minister and his own Department of Research, Giske promised to look closer into the matter and invite the Abel working group to further talks.³¹

²⁷KD, Saksnr. 00/7309, FO./ESO, Archive code 757, “Abelprisen i matematikk, Niels Henrik Abels minnefond” and Saksnr: 01/4385, FO./ESO, Archive code 001 “Spørsmål til skriftlig besvarelse fra representanten Rolf Reikvam om etablering av en Abelpris i matematikk”. *Aftenposten* 28.5.2001. “Ber om 150 mill. til Abel-pris”.

²⁸E.g., *Aftenposten* 1.6.2001, “Økt press på Abel-prisen”.

²⁹“Spørsmål til skriftlig besvarelse” (spørsmål nr. 421), 30. May 2001. KD, Saksnr. 01/4385, FO./ESO, Archive code 001 “Spørsmål til skriftlig besvarelse fra representanten Rolf Reikvam om etablering av en Abelpris i matematikk”.

³⁰KD, Saksnr. 01/4385, FO./ESO, Archive code 001 “Spørsmål til skriftlig besvarelse fra representanten Rolf Reikvam om etablering av en Abelpris i matematikk”. See also the letter from the secretary of state Tom Therkildsen at the Office of the Prime Minister to the Abel Prize working group, 18.6.2001, NVJ.

³¹Trond Giske’s response 7.6.2001. KD, Saksnr. 01/4385, FO./ESO, Archive code 001 “Spørsmål til skriftlig besvarelse fra representanten Rolf Reikvam om etablering av en Abelpris i matematikk”.

8 Breakthrough

On July 18, the working group received a call from a state secretary in the Ministry of Education and Research who asked if they could come to a meeting the following day. This was now “a matter of great importance”. The director general in the Ministry’s Department of Research and a state secretary from the Ministry of Finance would also take part in the meeting. The working group immediately got together to prepare their answer to the main question that would come up the next day: why an Abel Prize in mathematics?³²

At the July 19 meeting, the State Secretaries of both the Ministry of Education and Research and the Ministry of Finance emphasized that for the Abel plans to come to fruition, it was absolutely crucial that the prize would contribute to strengthen the position and status of the natural sciences and mathematics in Norway, and increase public awareness of the societal importance of these fields of knowledge. The working group was asked to formulate some thoughts about this issue as soon as possible. Four days later the group presented a document on how the Abel Prize could meet those requirements with regard to both school-aged and university students, researchers and the general public. There already existed two Abel associated mathematics competitions in Norwegian schools: KappAbel at the final level of primary school and the Abel competition in upper-secondary school. These competitions could organizationally be placed under the umbrella of the Abel Prize, and this merger would increase media attention as well as the status of the competitions. Students at universities and university colleges could find motivation from the fact that the international mathematical stars would come to Norway on a regular basis, and Norwegian mathematicians would be given unique opportunities to create networks and work with the world’s top mathematicians and mathematical research centers. In this way—the working group argued—the Abel Prize would also contribute to enhance public understanding of mathematics and the natural sciences as important cornerstones of modern society. The Abel Prize working group ended with a quote from the IMU president Jacob Palis: “Abel’s prize would certainly make mathematics much more visible to society and perhaps this is more important than ever”.³³

Then things really began to move. In early August the working group was again contacted by the Ministry, which wanted them to specify the organizational structures and budget. A couple of weeks later the Ministry wanted further biographical details on Abel and his scientific contributions and importance. The working group was now totally on home ground, and their paper “Facts about Niels Henrik Abel” was immediately—and without the knowledge of anyone in the working

³²Jens Erik Fenstad in two e-mails to the working group, 18.7.2001. NVJ.

³³Letter from Nils Voje Johansen on behalf of the working group to the secretary of state Randi Øverland in the Ministry of Education and Research, 23.7.2001, “Abel-prisen og rekruttering til realfagene” og notat til KUF og Finansdepartementet, “Virkninger av en Abel-pris i matematikk”. KD, Saksnr. 00/7309, FO./ESO, Archive code 757, “Abelprisen i matematikk, Niels Henrik Abels minnefond”. E-mail from Jacob Palis to Arnfinn Laudal, 19.7.2001, NVJ.

group—passed on from the Ministry of Education and Research to the Office of the Prime Minister.³⁴ Like many of the Ministry of Finance economists, Prime Minister Stoltenberg was educated at the University of Oslo’s Department of Economics. And like many of the economists in the Ministry of Finance, Stoltenberg would soon prove to be very much in favor of creating an international mathematics prize that was believed to support the visibility of and interest in mathematics in Norway.³⁵

The working group had no idea that Prime Minister Stoltenberg would announce the establishment of the Abel Prize during a speech to the local Labour Party youth organization Arbeidernes Ungdomsfylking (AUF) at the University of Oslo’s Blindern campus on August 23, 2001. The working group knew that the Prime Minister was scheduled for a meeting with the university rector later in the day, and because of this they had provided the rector with further arguments in support of the prize.³⁶ Three of the six working group members nevertheless walked the few meters from the Niels Henrik Abel building to the auditorium in the neighboring Vilhelm Bjerknes building, where the Prime Minister was to meet with the AUF. Here the working group members hoped to have a quick word with Stoltenberg and deliver a letter they just had received from the IMU president. In the letter Jacob Palis gave an assurance that the IMU “in every possible way” would cooperate with the Norwegian government and the Norwegian Academy of Science and Letters “in establishing such a wonderful prize and in implementing it in the most dignified form”.³⁷

IMU would soon get the opportunity to do so. The Abel Prize working group members immediately understood what was coming when they saw that all of their bureaucratic and political contacts from the past month were present at the Prime Minister’s meeting with the local branch of AUF at Blindern.

9 High Expectations

A press release from the Office of the Prime Minister later that same day stated that “the Government wanted to heavily increase the focus on mathematics and natural sciences”. The Abel Prize should “serve as an encouragement for both students and researchers alike” at a time “when great parts of the Western world experienced a decline of interest in these fields of knowledge”. The prize was intended “to make visible the importance of mathematics and the natural sciences”. Prime Minister Stoltenberg hoped the prize would “improve the recruitment of young people to

³⁴The paper “Fakta om Niels Henrik Abel” was sent from the Ministry of Education and Research to the Office of the Prime Minister til SMK on the 22.8.2001. KD, Saksnr. 00/7309, FO/ESO, Archive code 757, “Abelprisen i matematikk, Niels Henrik Abel minnefond”. Interview with Nils Voje Johansen, 16.12.2011.

³⁵Telephone interview with Prime Minister Stoltenberg 7.11.2011.

³⁶E-mail from Jens Erik Fenstad to Helge Holden, 2.11.2001, NVJ.

³⁷Telefax from Jacob Palis to the Abel Prize working group, 22.8.2001. KD, Saksnr. 00/7309, FO/ESO, Archive code 757, “Abelprisen i matematikk, Niels Henrik Abels minnefond”.

mathematics and the natural sciences, the strengthening of Norwegian mathematical research, and the image of Norway as a knowledge society”.³⁸

The Labour Party government was not alone in wanting to strengthen the position and status of mathematics and the natural sciences. From around the turn of the century, this topic was considered to be one of the most important issues by all major Norwegian political parties. The first OECD Programme for International Student Assessment (PISA) survey in 2001 presented a gloomy picture of Norwegian students’ knowledge about, and attitudes towards, mathematics and the natural sciences. This was a serious wake up call that seemed to confirm what had been an increasing suspicion recent years: the Norwegian educational system was in poor shape. High quality competence in mathematics, natural sciences and technology was now seen as the key factor to improve the future capacity for innovation and economic growth in the so-called global knowledge economy.

This shift was evident in all areas of Norwegian education and research policy. In research, the creation of the Norwegian Centres of Excellence system in 2002 represented a serious break with the traditional and essentially egalitarian national policy in that field. In higher education, the so-called Quality Reform in 2003 was inspired by similar concerns, as was the Knowledge Promotion reform in primary and secondary schools in 2006. Since 2002, both the center-right and the center-left governments have presented and updated their own strategic plans to support mathematics, natural science and technology studies and research. These fields of knowledge were all matters of increasing political attention, and simultaneously more elitist perspectives gained ground in the Norwegian debate regarding primary and secondary schools, higher education and research. The Abel Prize plans encompassed the very essence of this political wave as it was about to break over the Norwegian political landscape [8, pp. 115–144].

The need to improve within the fields of mathematics, natural science and technology in order to succeed in the developing so-called knowledge economy thus became an axiom of all major Norwegian political parties—from the Socialist Left Part on one side to the right-wing Progressive Party on the other—from about the turn of the century. All the members of the parliamentary Standing Committee on Education, Research and Church Affairs thus fully supported the prize when it was announced, and basically for the same reason: fear that the Norwegian educational system—from top to bottom—was unprepared to meet the challenges from the developing knowledge economy when it came to mathematics, natural science and technology. The Conservative Party representative stated that Norway “was facing a general natural sciences crisis”, and that any measure taken to counteract this was “most appropriate”. The Liberal Party committee member hoped the prize would help to turn the “decay of natural science in this country”. The former minister of education and research and Christian Democratic Party representative said the prize might come to mean just as much for natural science in Norway “as the Nobel Prizes means for science in Sweden”.³⁹ The right-wing Progressive Party had for a long

³⁸Press release 155/2001, 23.8.2001. The Office of the Prime Minister.

³⁹*Aftenposten*, 24.8.2001: “200 millioner kr til nyopprettet Abel-pris”.

time warned against the economical consequences of a decline in the “hard subjects” within the national educational system, and the party’s representative had early in the process encouraged the Abel Prize working group to ask for more money.⁴⁰ On the other side of the political spectrum, the Socialist Left Party representative became—as we have seen—the most important advocate of the committee when he brought the question about the prize to Parliament in the end of May.

A significant section of the international mathematical community now hoped that they would soon be enjoying a mathematical counterpart to the Nobel Prizes. Because of the frustration caused by—as IMU president Palis had put it—“a century old one and an ever discussed missing feature of the scientific work of our community”, the history about the Abel Prize and how it “went to heaven” with the dissolution of the union between Sweden and Norway in 1905, did resonate extremely well in the international mathematical community. The story brought forward by the Abel Prize working group was nothing less than the story of how one hundred years earlier Norway had been on the verge of creating a prize in mathematics almost as prestigious as the Nobel Prizes, and at the same time and in the same kingdom! This was undoubtedly the single most important reason for the overwhelming and absolutely decisive support from the highest level in European and world mathematics via the EMS and IMU.

The establishment of the Abel Prize one hundred years later could therefore also be seen as the righting of old wrongs against mathematics. In influential parts of the international mathematical community, the Abel Prize was from the very beginning clearly seen as a very close relative to the Nobel Prizes, both historically and geographically. One week after the announcement of the prize, *Science*—the journal of the American Association for the Advancement of Science—stated it clear and simple: “For mathematics, Abel = Nobel” [1]. President of EMS Rolf Jeltsch wrote in his annual report that the creation of the Abel Prize would have enduring consequences for mathematics both in Europe and in the rest of the world. In a short time it also became common for mathematicians internationally to speak about the Abel Prize as the “Nobel Prize in Mathematics”.⁴¹

However, some Canadian mathematicians soon became concerned about what the creation of the Abel Prize would mean for the status and prestige of the Fields Medal, and wrote an open letter to their prime minister: According to the Canadian mathematicians, few people were aware that John Charles Fields was a Canadian, that the prize was originally a Canadian idea and that the medal foundation was in Canada. They argued, largely in vain, that the newly established Abel Prize had to be met by the Canadian government with a strong manifestation of the Canadian identity of the Fields Medal and a marked increase in the modest prize value.⁴² IMU—which awarded the Fields Medal—was nevertheless relatively clear in its

⁴⁰Nils Voje Johansen’s meeting with Ursula Evje (FrP) in Parliament (Stortinget) 23.5.2011, NVJ.

⁴¹President Rolf Jeltsch to EMS, December 2001, NVJ.

⁴²“Open letter to the Prime Minister of Canada”, 7.5.2002. From Nassif Ghoussoub, Arvind Gupta and Robert V. Moody. YR.

support for the new Abel Prize as a mathematics counterpart to the Nobel Prizes. And obviously the generous funding of the prize from the rich Norwegian state played an important role in gaining this support from large parts of the international mathematical community. The marketing of the Abel Prize during the first years thus came to show clear similarities to the establishment of the Nobel Prizes in the early twentieth century; both prize winners and their often very influential scholarly communities almost systematically praised their respective prizes very highly, thereby increasing the prestige of both the prizes and the academic elites that received them. In these processes, media attention has been of vital importance. Media fascination from the start seemed to reinforce a general will to believe that a prize that entails so much money as well as so much prestige simply must be just and important [5, especially pp. 268–272].

In summary, it is fair to say that when the initiative was finally brought out in the open in the spring of 2001, the entire spectrum of Norwegian political parties and significant and influential sections of the international mathematical community were fervent in their desire for the prize, but for entirely different reasons. For many years the campaign started by Abel's biographer Arild Stubhaug had garnered polite interest but little true support among Norwegian mathematicians. When the Telenor CEO and Labour Party veteran Tormod Hermansen came into the picture in the summer of 2000, the issue was put into a much larger cultural and political context, and soon the Abel Prize initiative proved to be much more in tune with the times than anybody had expected: Norwegian politicians across the whole political spectrum—from the Socialist Left Party to the Progressive Party—saw the prize as an opportunity to promote mathematics and science and counteract an alarming decline in these fields within the national educational system, as well as a way to promote Norway as a knowledge society. And the international mathematical community finally—after one hundred years—got a prize they both hoped and believed could equal the Nobel prizes. Well underway, the process was also characterized by close and informal contacts among academics, politicians, bureaucrats and industrial leaders, relationships that would possibly be much harder to manage in a larger political system.

The story of how the Abel Prize came about is a piece of contemporary national history about how politics could be made off the public scene through close networks in a small nation. The story would also almost repeat itself in 2005 when the Kavli Prizes in Astrophysics, Nanoscience and Neuroscience were established with an ambition to become as important for the development of these fields of knowledge in the 21st century as the Nobels had been for physics, chemistry and medicine in the 20th. As the Abel Prize, the Kavli prizes would also be awarded by the Norwegian Academy of Science and Letters. And again the establishment was a result of a close collaboration between an industrial leader, scientists, bureaucrats, and the Ministry of Education and Research. Only this time the sponsor providing the necessary funding to reach the level of the Nobel prizes was not the ever richer Norwegian state but the US-based Norwegian-born entrepreneur, billionaire

and long time science benefactor Fred Kavli.⁴³ The story of the Abel prize is also an account of how cultural heritage can be recruited as a resource for science policy: how the prize could bring together politicians, bureaucrats and mathematicians for a spectrum of cultural-political purposes from differing constituencies working with a variety of interests.

10 Nobel Level?

It is too soon to accurately present an authoritative historical judgment of the first ten years of the Abel Prize. Nevertheless, it is possible to make some tentative observations regarding the extent that the prize has succeeded in establishing its reputation and status, both in the academic community and in the greater public, both in Norway and internationally.

It was a bold ambition to establish the Abel Prize as a mathematical counterpart to the Nobel Prizes, but as we have seen, the approach was warmly welcomed by the international mathematical community. This support was not only important but also absolutely necessary for the subsequent political acceptance of the prize. During the first ten years, the prize seems to have been firmly established, not the least because the winners are chosen by an international committee whose members are nominated by the EMS and IMU. Unlike the national Swedish Nobel committees and the national Norwegian Peace Prize committee, the Abel committee leans on the expertise of the highest European and world organizations within the field. So far few controversies have risen from the Abel awards. After just two years, and the awards to Jean-Pierre Serre (2003) and the shared prize to Michael F. Atiyah and Isadore M. Singer (2004), the mathematics section of the US National Academy of Sciences sent their most sincere congratulations:

We extend our congratulations to the Abel Prize Committee, to the Norwegian Academy, and to the Norwegian Government, for their outstanding management of the Abel Prize these two first years. [...] In two unerringly placed awards, you have made the Abel Prize the leading international prize in Mathematics—the true “Nobel Prize” of Mathematics.⁴⁴

In spite of the strong academic support, the prize has had problems in obtaining media attention both in Norway and internationally. To increase the general awareness and knowledge of the prize, key persons have tried to establish more formal links between the Abel Prize and the Nobel Prizes. Former IMU President David Mumford was a member of the first Abel committee, and he had very high ambitions for the prize. To ensure that the Abel Prize would reach “the general consciousness

⁴³<http://www.kavliprize.no>.

⁴⁴Letter from Richard V. Kadison, Chairman for the mathematics section in National Academy of Sciences, USA, to the Norwegian Academy of Science and Letters, 28.4.2004. The archives of the Norwegian Academy of Science and Letters (hereafter DNVA), file: Abelkomiteen.

of the world” in a way comparable to the Nobel Prizes, he advocated to use more actively the history behind the prize. This history—according to Mumford—showed “that the Abel Prize is logically the long missed mathematics component of the Nobel awards”. Mumford thus suggested that the president of the Norwegian Academy of Science and Letters should get in contact with its Swedish sister academy to ask if they could officially present the creation of the Abel Prize during the 2002 Nobel Prize award ceremony in Stockholm.⁴⁵ The following year, the new IMU president John Ball followed up on Mumford’s idea. If the Norwegian Academy of Science and Letters did not have any objections, he would very much like to try to persuade the Royal Swedish Academy of Sciences to, at least, “give a recognition of the Abel Prize”.⁴⁶

Both within the Norwegian Academy and the Niels Henrik Abel Memorial Fund Board it was generally known that such recognition from either the Swedish Academy or the Nobel Foundation was not likely given the traditional and strong exclusivity of the Nobel Prizes. At the same time, the Norwegians enjoyed the references in print and media stating that the Abel Prize was a Nobel in mathematics.⁴⁷ It took six years for the *New York Times* to include a full-page article on the Abel Prize; by then it was—according to the newspaper—“widely regarded as the Nobel of mathematics”.⁴⁸ The Nobel Foundation was not at all pleased with the repeated presentation of the Abel Prize as a Nobel in mathematics, and after some years they took action to ensure that this practice at least was not officially promoted by the Abel Prize itself. In 2008 the foundation sent a stern message to the Norwegian Academy: “The Nobel Foundation has noticed that the ‘Abel Prize’ in some contacts with media, and in some e-mails, has been presented as ‘the Nobel Prize of Mathematics’.” Further, the letter stated that it was a registered trademark, and the Norwegian Academy should know that the Nobel Foundation always had and always would protect this trademark “from degeneration and watering down with great care and determined efforts”. Those responsible for the Abel Prize were strongly requested to “carefully avoid” such practice in the future “in a, for us, matter of great importance”.⁴⁹ Apart from this—and although the Abel Prize has not been the subject of much media attention in Sweden—it seems that the Abel Prize

⁴⁵E-mail from David Mumford to the president of the Norwegian Academy of Science and Letters, Lars Walløe, 29.10.2002, NVJ.

⁴⁶E-mail from IMU President John Ball to Chairman of the Abel Committee Erling Størmer, Chairman of the Abel Board Jens Erik Fenstad, and General Secretary of the Norwegian Academy of Science and Letters Reidun Sirevåg, 17.11.2003. JEF.

⁴⁷See for example F. Thomas Bruss, “Homage to the Abel Prize. Homage to Norway” in EMS Newsletter June 2005, NVJ.

⁴⁸*New York Times*, 31.5.2009: “Complex Math, Simple Sum: 3 Awards in 5 Years” <http://www.nytimes.com/2009/06/01/nyregion/01nyu.html> (visited 10.12.2011). The theme of the NYT article was that in the short history of the Abel Prize, already three professors at New York University had received the prize.

⁴⁹Letter from the Nobel Foundation to the Norwegian Academy of Science and Letters, 21.4.2008, DNVA.

has been received in a rather welcoming way also there. Perhaps it helped that the Swedish mathematician Lennart Carleson was awarded the Abel prize in 2006, as three years later, the leading Swedish newspaper *Dagens Nyheter* presented both the Fields medal and the Abel Prize as the only prizes in mathematics on “Nobel level”?⁵⁰

Even though only very few Norwegian mathematicians were involved in the planning for an Abel Prize, the whole Norwegian mathematical community did receive it with open arms. Initially it caused some frustration that the planning was carried out in secrecy as an exclusive project of a small group of Oslo mathematicians. For example, in 2001 Professor Helge Holden from the Norwegian University of Science and Technology in Trondheim was heading the national committee for the Abel bicentennial celebrations together with Jens Erik Fenstad from the University of Oslo. Holden was not very pleased that he, in this position, knew nothing about the prize plans until he read about them in the newspapers.⁵¹

When the Abel Prize plans became known to the public at the end of May 2001, both the Royal Norwegian Society of Sciences and Letters in Trondheim (in the middle of the country) and a planned university in Abel’s home county Agder (in the south) wanted their share of the prize. The Academy in Trondheim—the oldest in the country—pointed to the fact that Abel had been an Academy member. In Agder, it was suggested that the planned university would be called the Niels Henrik Abel University. It was then, they argued, “a natural consequence that the prize would be awarded by the university which carries his name”.⁵² When the plans became known outside Oslo, they had nevertheless been developed to a point where there was little room for a traditional Norwegian regional or center vs. periphery debate.

Additional activities were soon put in place to secure support from Norway’s mathematicians and universities. Parts of the official program took place in Trondheim, central Norway, Bergen in the west and Kristiansand in the south. The Norwegian Mathematical Society was thoroughly revitalized in numerous ways. Most importantly, the society was put in charge of the annual and week-long international Abel Symposia which since 2004 has attracted cutting edge mathematicians from all over the world, and every year different Norwegian universities have been given special responsibilities for the symposium. Abel stipends have been created to support recruitment at the universities, and there are numerous activities in Norwegian schools connected to the prize, most notably the primary school KappAbel competition and the upper secondary school Abel competition.

The Niels Henrik Abel Memorial Fund was from the start worth NOK 200 million (approximately USD 35 million), NOK 50 million more than the Abel Prize

⁵⁰*Dagens Nyheter*, 11.10.2009, “Matematik i praktiken”.

⁵¹E-mails between Jens Erik Fenstad and Helge Holden 2.11.2001, JEF.

⁵²Letter from the President of the Royal Norwegian Society of Sciences and Letters in Trondheim, Karsten Jacobsen, to the Abel Prize Working Group, 12.6.2001, NVJ. Letter from the Agder County Council to Prime Minister Kjell Magne Bondevik (Christian Democratic Party), 2.4.2002, “Sørlandet som utdelingssted for matematikkpris og lokaliseringssted for fondstiftelse”. KD, Saksnr. 00/7309, FO./ESO, Archive code 757, “Abelprisen i matematikk, Niels Henrik Abels minnefond”. The new university was finally called the University of Agder.

working committee had asked for. This came close to an embarrassment for the mathematicians, as the symbolism of asking for 200 million at the bicentennial should be more than obvious. The NOK 200 million fund also provided almost exactly the income the group had wanted: a budget of NOK 12.4 million to cover the prize (NOK 6 million), administration and associated activities, such as the Abel Symposia and the school competitions.⁵³ These additional activities were also important from the view of Norwegian politicians. Because of this, the Abel Memorial Fund Board soon created a Child and Youth Committee to support and fund mathematical activities all over the country. A mathematics teachers' prize was also established in 2005 in honor of Abel's teacher, Bernt Michael Holmboe. An annual Holmboe Prize of NOK 50,000 (approximately USD 8,500) is awarded in Abel's old school, Oslo Cathedral School, by the Minister of Education and Research the day before the Abel Prize itself, and in the presence of the Abel Prize laureate.

11 Conclusion—And the Need for Future Adjustments?

In conclusion, it is fair to say that the Abel Prize has gained significant reputation and prestige in the international mathematical community, and has injected new life into Norwegian mathematics. This article has explained how the prize was established in light of multiple intentions and ambitions among a great variety of actors and stakeholders, both nationally and internationally, during a short period of time in 2000 and 2001.

From the outset, the plans for an Abel Prize in mathematics were presented by Abel's biographer, the poet and author Arild Stubhaug, without gaining much support from the Norwegian mathematical community. The plans were nevertheless eventually warmly embraced by the major Norwegian political parties, all increasingly concerned with educational performances in mathematics, natural science and technology and the future capacity for innovation and economic growth in the so-called global knowledge economy. In the process of creating political awareness of the prize plans, Stubhaug initially got substantial help from the prominent Labour Party politician and industrial leader Tormod Hermansen. But it was also of crucial importance that Norwegian mathematicians took real interest in the project in the spring of 2001. The small group of mathematicians at the University of Oslo was instrumental in collecting the decisive support from the highest level in European and world mathematics via the EMS and IMU. Without this strong international academic support, it is not likely that the plans would have seen a political breakthrough in Norway.

For the international mathematical community in large, and especially for EMS and IMU, the Abel Prize was an opportunity finally—after one hundred years—to establish “the missing Nobel in mathematics”. For Norwegian mathematicians the Abel prize became a welcome opportunity to celebrate one of their own grand heroes and increase their international attention and cooperation. And, even though

⁵³The fund was placed in government bonds with a ten-year fixed interest rate of 6.2 %.

the prize was unanimously supported by all major Norwegian political parties, the Labour party government could proudly present a prize that—as previously noted—aimed to “improve the recruitment of young people to mathematics and the natural sciences, the strengthening of Norwegian mathematical research, and the image of Norway as a knowledge society”.⁵⁴ In this way the story of the creation of the Abel Prize stands as no exception when it comes to how it promised pride and prestige to important stakeholders. But the story to some extent stands out in the way both political authorities and national and international academic communities could read quite different desires and ambitions into the prize in a given place at a given time: the wealthy oil-nation Norway concerned with educational performances at the time of the Niels Henrik Abel bicentennial. In a matter of months, this nexus of desires and ambitions gave rapid and strong momentum to the establishment of a science prize that just a handful of people could only imagine one year earlier.

There is nothing to suggest that the broad support obtained through the process described in this article has diminished in any way during the first ten years. However, the finance model changed from 2012 because of the steep fall in interest rates during the international financial crisis. The fund was liquidated, and the Abel Prize was now listed clearly as a separate post on the national budget. This of course means greater insecurity for the future, but in the first year after the change the Abel budget was increased by a few hundred thousand NOK. As we have seen, the prize has also had problems with low levels of media attention. In addition, it has been especially difficult to ensure that the laureates’ work is understandable to the general public. As the need to increase the popularity and visibility of mathematics was a major argument in obtaining political support for the creation of the prize, these problems are challenging. The Abel Prize working group stated in the spring of 2001, the prize would “demonstrate the numerous mathematical applications in science, society and technology”; the prize has only lived up to this promise to a small extent.

It would appear that first and foremost the Norwegian Academy of Science and Letters and the Abel committees wanted to firmly establish the prize via uncontroversial awards to the grand old men of “pure” mathematics. In the short run, this seems to have been a successful strategy. In the longer run however, this strategy may prove somewhat risky, when much of what is of most—at least obvious—importance for the rest of the world, goes on in more applied parts of the broad mathematical field. A systematic opening of the prize towards more applied areas of mathematics could instigate controversies within the mathematical community and lead to more controversial awards. It might also increase the level of outside and media attention. Such an adjustment would be a bold one after just ten years, but then again, the history of the Abel Prize—both the long and the short one—is paved with bold ideas.

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⁵⁴Press release 155/2001, 23.8.2001. The Office of the Prime Minister.

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