
THE NOBEL PRIZE was referred to in a Liberal Party campaign in 2010.

# Solving pressing problems by prizing praised proposals

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You can almost hear the wind grabbing the rotor blades, the creaking as they slowly start to turn. You can almost see how their rotation makes the winder move. First slowly, hesitantly. Then with more certainty, soon rhythmically. The circular movement around and around becomes vertical travel up and down, up and down. You can almost feel the movement that mechanically transports the ore up from the mine. Once everything is moving, the construction appears impossible to stop.

There are no people or animals in the unsigned, poster-sized drawing of the winder from 1810. Over-explicitly, it shows how ore can be extracted from a mine shaft using wind power alone. There is no longer a need for waterwheels, horses or steam engines. Using the wind's action as the only power source could mechanise mining, even in smaller shafts where there were no other sources of power.

However, despite its suggestive force, the drawing did not succeed in moving the Academy of Sciences' members. Their conclusion was straightforward: no wind in the world could make the construction work. The winder would either remain still or be blown to pieces. The drawing's visually convincing pedagogy did not have a chance against the plain mathematics of theory. Because this was the only answer submitted to the Academy's prize question in 1808, how "Stormy Weather's Forces" could be used in processing ore, the prize of 50 ducats was withheld.

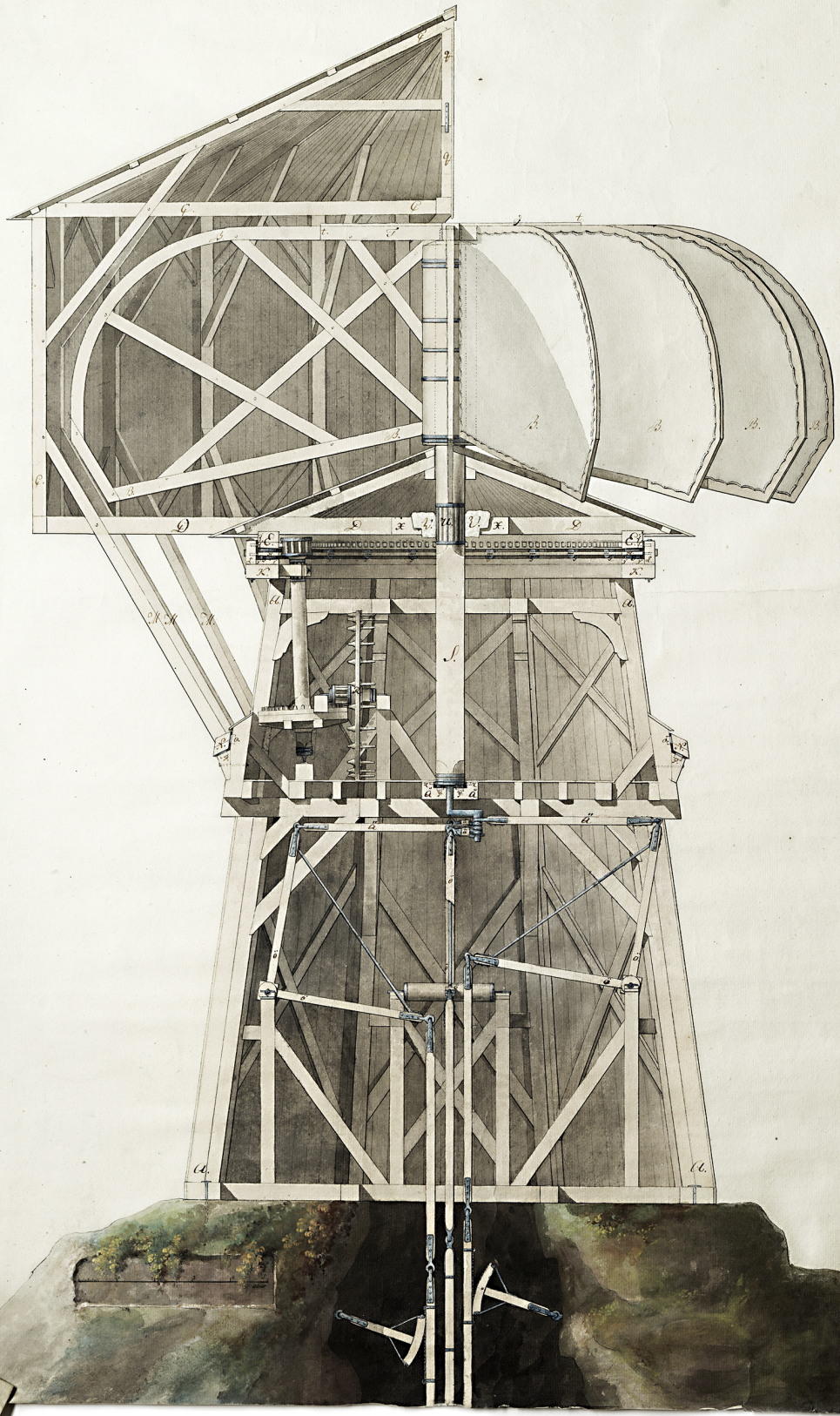
How could one keep a lantern burning under water? What is the best soil mixture with which to replace manure? What is the best way of driving caterpillars from fruit trees? From its very start, the Academy of Sciences

DRAWING OF A WINDER, submitted as an answer to one of the Academy's prize questions in 1808.

Planche N:o 1.

# Förs[illegible]k

Til Svar på Kongl. Vetenskaps Academiens Pris-fråga: Huru skola Blåsvädrens Kraft, genom tjenliga Mechaniska Inrättningar, förmånligast kunna användas vid Grufver och Bergverk, til Malms Uppfordring, Bokning och Häfsning, då belägenheten är sådan, at vattfall för spelhjul, icke är at tilgå, häft-vindar, i anseende på Dragares underhåll, fälla för kostsamme, och Bränsle för Ång-Machiner saknas?



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asked a range of questions to which it wanted answers. Unlike common practice abroad, initially the Academy rarely used financial rewards as motivation. There was simply no prize money. And, typically, when they did try to reward the best proposal for bleaching linen cloths, for example, no answers were submitted. When the attempt with prizes was repeated a decade or so later, for the best explanation of the active processes in the production of high phosphorous iron, all the responses were judged too poor to be rewarded.

These circumstances changed thanks to a donation by Fredrik Sparre, surveyor to the royal household, which meant that the Academy of Sciences could award financial prizes for the best articles in the Academy's *Transactions* for a few years in the 1750s. However, in 1761 this was changed so that the money was used as a reward for various prize questions. Over subsequent decades, several similar donations were received and the number of prize questions increased. Actually, after publication activities, these prize competitions have been regarded as the Academy's "most spectacular manifestations".

The idea was that the interested public, as well as renowned Academy members, would be encouraged to produce ingenious solutions to difficult but pressing problems, such as building and maintaining fish ponds or finding the most successful anti-rust treatment. The best answers would then be rewarded with money or other honours. The Academy could also publish them for general dissemination. This was an effective tool for approaching the various challenges of the time, large and small. The intention was good, but the results were sometimes lacking. As stated, not all the prize questions received answers and the ones that did arrive were often too few and too poor.

The submitted solutions were judged by a committee of a handful of Academy members or other confidants. However, assessment criteria were rarely or never provided, with the consequence that it was often hard for the experts to agree, for example on the best way to rid a garden of moles. After voting and voting again, sometimes with difficulty and written correspondence, a prize-winner could often be announced. If several contributions were good enough, there could be a whole podium of winners: first, second and third place. While the originators of previously unknown inventions and findings were rewarded with prize money, jettons and other honours, they could also be published and thus become more widely known. The real point of the prize competitions was namely the dissemination of good solutions to actual problems, especially in agriculture.

Competing in findings and advice was thus not ridiculous, but was a clever way of obtaining texts worth printing and distributing. Actually, in the 1760s, the publication of various competition answers became a separate and popular periodical series. Prizeworthy discoveries were rewarded so they would achieve wider recognition, not because they had already made a breakthrough.

The competitions thus reflected an important aspect of the Academy of Sciences' ideals in the 18th century; that it would function as a meeting place for different categories within the estates of the realm. Naturally, the nobility, clergy and burghers were represented in various forms, such as university tutors, officials, squires and officers. These were men with a high social status from the capital or Uppsala. There were astonishingly few women elected throughout the entire century, precisely one Swede and one foreign woman. There was also a lack of representation for the more populous groups of peasants, land-owning farmers and crofters.

But the competitions were open to everyone. Even farmers could try to find the richest deposits of good soil in the kingdom, or describe the best way to breed bees. The competitions therefore testify to a view of practical knowledge which everyone could be included in compiling. Provided you were literate – which was not a given in the 18th century – or had someone who could help you author a submission, you could try your luck in a prize competition. However, all those who were appointed to judge the entries were well-established academics or other trusted men. They were not unknown quantities.

The prize competitions changed character in the 19th century. Declining interest in submitting answers was noted from the mid-1770s. There was competition from, among others, the newly-formed Patriotiska sällskapet [Patriotic Society], which issued a wholly agriculturally focused journal, *Hushållnings-Journal*. The interest in prize questions further declined in the 1780s, and they were only sporadically issued at the end of the 18th century. This declining interest was difficult to reverse, because the available prize money was shrinking. The competitions were eventually revived at the start of the following century, only to be dropped again. Money that was donated for prizes was instead channelled to other activities at the Academy. This probably also applied to 1808's unpaid prize money of 50 ducats for the best suggestion on how to use wind power in mining.

Prize competitions were abolished when the new statutes of the Academy were adopted in 1820, as one way of creating greater academic and scholarly weight. Instead, the best scientific investigations in various areas were now rewarded post-publication. In one stroke, the entire institution changed and prizes were now exclusively awarded to scholarly works or other cultural achievements, often published or in some other way previously announced. It was not uncommon for the Academy's own members to be rewarded, confirming that they really were the cream of the crop among the research elite.

Over the course of the 19th century, the number of prizes for which the Academy of Sciences was responsible increased. They were almost all named after the donor. Ferrner, Lindbom, Florman, Wallmark, Letterstedt, Edlund, Arnberg, Adelsköld, Söderström and others have, through prize donations

to the Academy, immortalised their family's names. They not only resulted in prizes for outstanding Swedish researchers and translators, inventors and authors; long lists of prize-winners also attracted people who liked to try to measure scientific quality with quantitative methods. Who was represented among the prize-winners? How often? Why?

The prizes were almost always individual and never awarded to organisations or large research groups, a fact that reflected the 19th century's romantic view of research. According to this sentiment, research was conducted by brilliant individuals who, in moments of divine, or at least spiritual, inspiration, made discoveries and presented results that could be rewarded for their beauty, simplicity, insightfulness, thoroughness, scope or other conventional signs of scientific greatness. Even today, prizes are rarely awarded to more than one or a few individuals. Research groups need not bother.

However, on Alfred Nobel's death in 1896, it was not a foregone conclusion that the Academy of Sciences would be tasked with deciding the recipients of the prizes stipulated in his will. Discussions were stormy. Although the Academy already awarded a considerable number of scientific prizes and awards, many people felt that the prizes entailed too great a commitment. The prize amounts were significant and the prizes were expressly international. The Academy was, however, attracted by the potential to use a sliver of Nobel's estate for other purposes too.

The Nobel prizes remain most widely known as a type of rhetorical measure of national research quality; the romantic 19th-century ideal for scientific prizes still shines through. In Sweden in 2010, the Liberal Party conducted an educational policy campaign on the theme, with nationalistic undertones. Yet it was probably not Tomas Tranströmer's Prize in Literature one year later that these liberal forces had in mind. In this type of reasoning, the prizes in Chemistry and Physics, along with the one in Medicine or Physiology, are the only ones that count.

The Academy of Sciences now awards about thirty scientific prizes, including the Nobel prizes in the sciences. Deciding upon laureates still comprises a considerable part of its activities. Work on assessing and comparing laudable research has become one of the Academy's most publicised tasks. In this way, the various prizes – particularly the Nobel prizes – are now an invaluable rhetorical tool for supporting research. They are not only concerned with rewarding outstanding research, but are also a form of marketing. The Academy of Sciences is actually now best known for the Nobel Prizes in Chemistry and Physics and, in Sweden, even more for the subsequent Nobel Banquet. In the light of an annual formal dinner at Stockholm City Hall, all the Academy's other activities to support research seem to pale in comparison.

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The drawing of the winder is in the Academy of Sciences' archive at the Center for History of Science, drawer 31 in the lower archive. The statement on the construction is in the Academy's diaries for 1807–1814 (1 August 1810, Section 2, App. N1), also at the Center for History of Science. The drawing's context was identified by searching all the prize questions in Brita Stina Nordin-Pettersson's article "K. Svenska Vetenskapsakademiens äldre prisfrågor och belöningar 1739–1820", in *Kungl. Svenska Vetenskapsakademiens årsbok*, 1959. Maria Asp was the one who realised that Nordin-Pettersson's article contained the information necessary to date the drawing, so her work has been invaluable. A good overview of the prizes prior to the Nobel prizes is Sven Widmalm's article "Normal science: Prizes in the Swedish Academy of Sciences before Nobel", in *Nuncius*, 1, 2019 (under publication). The Letterstedtska prizes are described in Inge Jonsson's *Jacob Letterstedt 1796–1862: Storföretagare och donator* (Stockholm, 2015). Debates about the Nobel prizes are described in Elisabeth Crawford, *The Beginnings of the Nobel Institution: The Science Prizes, 1901–1915* (Cambridge, 1984). Other information is found in Sten Lindroth's *Kungl. Svenska Vetenskapsakademiens historia* (Stockholm, 1967) and in E. W. Dahlgren's *Kungl. Svenska Vetenskapsakademien: Personförteckningar 1739–1915* (Stockholm, 1915), in which page 255 states that the prize questions were abolished in 1820.