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The Absurdity of the Nobel Prizes in Science

Ed Yong, *October 3, 2017, The Atlantic*

They distort the nature of the scientific enterprise, rewrite its history, and overlook many of its most important contributors.

This morning, physicists Rainer Weiss, Kip Thorne, and Barry Barish received the Nobel Prize for Physics, for their discovery of gravitational waves—distortions in the fabric of space and time. The trio, who led the Laser Interferometer Gravitational-Wave Observatory (LIGO) project that recorded these waves, will split the 9-million-Swedish-krona prize between them. Perhaps more importantly, they will carry the status of "Nobel laureate" for the rest of their lives.

But what of the other scientists who contributed to the LIGO project, and whose names grace the three-page-long author list in the paper that describes the discoveries? "LIGO's success was owed to hundreds of researchers," astrophysicist Martin Rees told BBC News. "The fact that the Nobel Prize 2017 committee refuses to make group awards is causing increasingly frequent problems and giving a misleading impression of how a lot of science is actually done."

This refrain is a familiar one. Every year, when Nobel Prizes are awarded in physics, chemistry, and physiology or medicine, critics note that they are an absurd and anachronistic way of recognizing scientists for their work. Instead of honoring science, they distort its nature, rewrite its history, and overlook many of its important contributors.

There are assuredly good things about the prizes. Scientific discoveries *should* be recognized for the vital part they play in the human enterprise. The Nobel Prize website is an educational treasure trove, full of rich historical details that are largely missing from published papers. And it is churlish to be overly cynical about any event that, year after year, offers science the same kind of whetted anticipation that's usually reserved for Oscar or Emmy nominees. But the fact that the scientific Nobels have drawn controversy since their very inception hints at deep-rooted problems.

The very first prize in medicine was awarded to Emil von Behring in 1901 for the discovery of antitoxins, but not to his close collaborator Shibasaburo Kitasato. The 1952 medicine and physiology prize went to Selman Waksman for the discovery of the antibiotic streptomycin, and ignored Waksman's graduate student Albert Schatz, who actually found the chemical. […] In some cases, people have protested their *own* omission. In 2003, one Ray Damadian took out a series of full-page ads in *The New York Times*, *The Washington Post*, and the *Los Angeles Times* to protest that he had been wrongfully denied a Nobel Prize in Medicine for his role in inventing magnetic resonance imaging. The Nobel committee only recognized Paul Lauterbur and Peter Mansfield for that feat—an omission that Damadian billed as a "shameful wrong that must be righted." "To wake up on Monday morning and see that I had been written out of history is an agony I cannot live with," he told the *Times*.

The wider problem, beyond who should have received the prize and who should not, is that the Nobels reward individuals—three at most, for each of the scientific prizes, in any given year. And modern science, as Ivan Oransky and Adam Marcus write in *Stat*, is "the teamiest of team sports." Yes, researchers sometimes make solo breakthroughs, but that's increasingly rare. Even

within a single research group, a platoon of postdocs, students, and technicians will typically be involved in a discovery that gets hitched to a single investigator's name. And more often than not, many groups collaborate on a single project.

Defenders of the prize note that the Nobel committee is bound to the conditions laid out in Alfred Nobel's will—the document that established the awards. But the will calls for the recognition of "the person"—singular—who has made the important discovery in their respective field "during the preceding year." The Nobel committee, by contrast, recognizes up to three people, for work that could have been done decades prior. If they are already bending the original rules, why not go further? As the editors of *Scientific American* suggested in 2012, why not award the scientific prizes to teams and organizations, just like the Peace Prize can be?

The price of reform is low, and the cost of avoiding it is high. As biologists Arturo Casadevall and Ferric Fang wrote in 2013, the Nobels promulgate the idea of the lone genius—the idea, summarized by philosopher Thomas Carlyle, that "the history of the world is but the biography of great men." Not so in science, and yet the Nobels feed this pernicious myth. And in doing so, say Casadavell and Fang, they "reinforce a flawed reward system in science in which the winner takes all, and the contributions of the many are neglected by disproportionate attention to the contributions of a few." In some ways, the prizes are not about who has made the most important contributions, but who has best survived the hazardous labyrinth of academia.

And in many cases, the prizes are about who has survived, full stop. Nobel Prizes cannot be awarded posthumously. So Rosalind Franklin was not recognized for her pivotal role in discovering the double-helical structure of DNA because she died four years before the Nobel was awarded to James Watson, Francis Crick, and Maurice Wilkins. Astronomer Vera Rubin provided evidence for the existence of dark matter by studying the way in which galaxies rotate—a feat that revolutionized our understanding of the universe. "Vera Rubin deserves a Nobel," said science writer Rachel Feltman in October 2016. "She probably won't get one in time." Rubin died two months later.

Rubin and Franklin point to another longstanding issue with the Nobels. In as much as they propagate the myth of the lone genius, that lone genius is almost always white and male. Women have won just 12 of the 214 prizes in physiology or medicine, just 4 of the 175 prizes in chemistry, and just 2 of the 204 prizes in physics. The most recent female physics laureate, Maria Goeppert Mayer, won her prize 54 years ago. It's not for lack of potential honorees, either. Rubin inarguably deserved one, as did Lise Meitner who contributed to the discovery of nuclear fission alongside laureate Otto Hahn. Between 1937 and 1965, Meitner was nominated 48 times by different people, and never won. "There are great things about the Nobel Prize but we should keep in mind that demographics of the winners reflect and amplify structural biases," said astrophysicist Katie Mack on Twitter last year.

Perhaps none of this would matter if the Nobels weren't such a massive deal. Beyond the monetary value of the prize, laureates are virtually guaranteed a stream of lucrative speaking gigs. Their papers garner more citations. They tend to live for a year or two longer than people who were nominated but never actually won. And the award imprints them with a permanent imprimatur of greatness. The Nobel Prize is not, say, a MacArthur genius grant, which is awarded to people "who show exceptional creativity in their work." It recognizes a *particular discovery*. And yet the discoverer is forever billed as an intellectual force in their own right—creating an equivalence between one historical contribution and their entire portfolio of ideas forevermore.

This creates problems when laureates become champions of pseudoscience or bigotry, as many have done. William Shockley, who received the 1956 physics prize for inventing the transistor, became a proponent of eugenics, arguing that people with low IQ—mainly African Americans—should be sterilized. James Watson has also claimed that Africans are less intelligent than average. Kary Mullis, who received the chemistry prize in 1993 for creating PCR—a technique for copying DNA that is used in every biology lab around the world—became a vocal proponent of astrology, and an equally vocal denier of human-made climate change, and the link between HIV and AIDS. He also wrote, in an autobiography, that he had once encountered a glowing raccoon that may or may not have been an alien.

In fairness, unlike the problem of how many scientists to award in a given year, the issue of laureates going off the rails is not one that the Nobel committee can solve. That one's on us—on our tendency to see the Nobel Prize as the apotheosis of scientific worth. It is not. Like every other prize, it is flawed and subjective. By reifying it, we overinflate the egos of those who receive it, and we undermine those who do not. "Ultimately, it's up to us to dethrone the Nobel Prizes," wrote science writer Matthew Francis last year. "They rule our perception of science and how it's done by our consent, and it's past time we withdrew that consent." (1420 words)

1. READING COMPREHENSION

Answer the following questions *in your own words.*

- Any passage including 3 or more words in sequence taken from the source, or paraphrase without citation will be penalized.

- 50 words minimum / question.

1. What is the "pernicious myth" mentioned by the author? Why is it a problem?

2. What are the reasons why the author thinks the Nobel Prize could be awarded to more than three people?

3. Summarize and explain the three main criticisms levelled at the Nobel Prize.

4. Explain the sentence below:

[…] it is churlish to be overly cynical about any event that, year after year, offers science the same kind of whetted anticipation that's usually reserved for Oscar or Emmy nominees.

2. ESSAY

Discuss the question below (450 words, +/- 10%; use a / every 50 words).

Will the Nobel Prizes ever be superseded or sink into obscurity? I suspect not in our lifetimes, and nor do I want them to. Public celebration of achievements for societal good is something which should be increased rather than ridiculed or downplayed.

Benjamin Burke, The Conversation, October 10 2014