THE OUTSIDERS

Prizewinners, No—But Not Losers

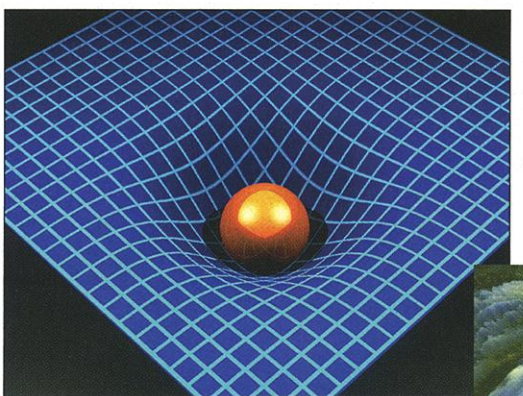
Through misjudgment or design, worthy theories and discoveries have failed to win the Nobel stamp of greatness

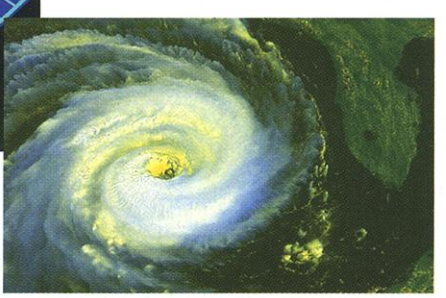
The caller to a radio talk show a few years ago was irate. How could teachers take Charles Darwin's theory of evolution seriously? After all, he asked the host, if Darwin was so great, "how come he never won a Nobel Prize?"

"Probably because he wasn't smart enough," growled the equally skeptical host from his Bible Belt studio.

The real answer is that Darwin died long before Alfred Nobel's will established the awards a century ago. And even if Darwin had lived long enough, it's doubtful that the great naturalist's musings on the origin of species would have fallen within the prize's reach of chemistry, physiology or medicine, and physics.

Although many people see the Nobel as *the* imprimatur of important science, a slew of discoveries that have shaped our world view—from the theory of relativity to the discovery of ancient human ancestors—were never recognized by the Nobel Prize committees. Some breakthroughs occurred in fields such as mathematics, earth sciences, and ecology that clearly fall outside the Nobel trio; other fields, such as astrophysics, were long excluded by the selection committees. Sometimes a discoverer died before a committee could act: Posthumous prizes are prohibited, with the exception of winners who die in the narrow window after they are named in October but before the award ceremony in December. And with 20/20 hindsight, it's clear that the august selectors have snubbed paradigm-shifting concepts. In perhaps the most famous example, Albert Einstein's relativity theory never achieved Nobel status (see p. 288).





Unrewarded. General relativity and weather fronts are among the groundbreaking ideas that Nobel committees did not, or could not, commemorate.

Scientists of all stripes have their favorite high-impact discoveries that never won the prize. Prominent examples include seismology wizard Beno Gutenberg's pinpointing of Earth's core, Vilhelm Bjerknes's explanation for weathermaking "fronts," and Ed Knipling's and Raymond Bushland's creation of sterile insects to combat agricultural pests. From a century's worth of unrecognized genius, here are five more un-Nobel ideas that researchers agree are scientific dynamite but had the misfortune of falling outside the terms of Nobel's will:

The Expanding Universe. In the 1920s and 1930s, astronomer Edwin Hubble helped reveal the Milky Way's smallness in an immense, and expanding, universe. From his Mount Wilson aerie, Hubble first showed that there are many galaxies outside our own, then proposed that distant galaxies produce a pronounced "red shift" in their spectra because they are speeding away. "Hubble's Law" holds that the fastest moving galaxies are the farthest from our own and lie on the cusp of a rapidly expanding universe. The discoveries made Hubble a celebrity, but the physics committee would not reconsider its exclusion of astrophysics. The jury is rumored to have voted him the prize just before his death in 1953, says biographer Gale Christianson of Indiana State University in Terre Haute. Hubble probably would have won sooner, he says, "if they hadn't diddled with the categories."

Island Biogeography. Robert MacArthur and Edward Wilson shook up ecology in the 1950s and 1960s by linking elegant math with creative fieldwork to develop theories of how species colonize new territories. Today, the ideas help conservationists figure out how much habitat endangered species need to survive, and evolutionary ecologists have seized on them to deepen their thinking about speciation and extinction, says Stuart Pimm of Columbia University in New York City. Although MacArthur died in 1972, Pimm notes that Wilson has hauled in a fair number of prestigious—and valuable—prizes. "Nobels are not everything," says Pimm. "For many of us, they aren't anything."

Continental Drift. Colleagues laughed at geoscientist Alfred Wegener's suggestion in

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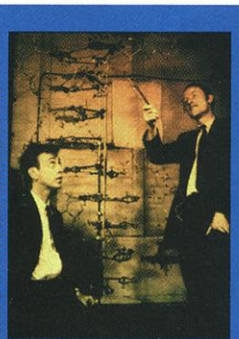
NOBEL NUGGETS

Postnuptial. By prior agreement, all the money from Albert Einstein's 1921 Nobel Prize went to his ex-wife Mileva Maric.

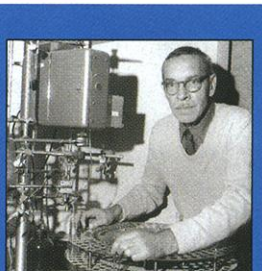


COLD SPRING HARBOR/VISUALS UNLIMITED

1962 ◀
James Watson, Francis Crick, and Maurice Wilkins win the prize in physiology or medicine for their discovery of the structure of DNA.

1965
Richard Feynman, Sin-Itiro Tomonaga, and Julian Schwinger win the prize for the discovery of quantum electrodynamics.

François Jacob, André Lwoff, and Jacques Monod are honored with the prize in physiology or medicine for the discovery of messenger RNA.



UPI

1969 ◀
Max Delbrück, Alfred Hershey, and Salvador Luria win the prize in physiology or medicine for showing that DNA carries genetic information.

The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel is established; the first prize goes to Ragnar Frisch of Norway and Jan Tinbergen of the Netherlands.

1915 that Earth's land masses wander across the globe. Wegener froze to death on a research expedition in Greenland in 1930, just as other researchers were beginning to take continental drift seriously. By the time indisputable proof emerged in the 1950s, Wegener had become a scientific footnote.

The Hidden Mind. On 31 October 1929, 73-year-old Sigmund Freud opened his diary and wrote: "Passed over for the Nobel prize." By then, decades after his groundbreaking theories of the unconscious mind and its influence on behavior, Freud was used to rejection. Biographers, however, say he held out hope to his dying day, a decade later, that Stockholm would call. But psychology and the social sciences were in their infancy in Nobel's day, science historians note, leaving those who study the human mind largely out of the prize's limelight.

Human Evolution. Darwin may have hypothesized the existence of apelike human ancestors, but it was Louis and Mary Leakey who found the first carefully documented fossils. In 1959, the husband-and-wife team unearthed the remains of a 1.75-million-year-old hominid in Olduvai Gorge in northern Tanzania, causing a worldwide sensation. But "bone hunting," paleoanthropologists complain, simply isn't considered a science in some circles.

–DAVID MALAKOFF

AFTER THE PRIZE

For Winners, a New Life of Opportunity—and Perils

Nobel fame and money propel laureates in many directions. Some leave science altogether; few remain unchanged

The Nobel Prize may be the most glamorous award a scientist can receive, but it can also be a curse. Few recipients are prepared for the publicity that comes with it. Some bedazzled winners have ventured into far-out, speculative projects, leapt into political causes, or just enjoyed being famous. Others have husbanded their fame and financial rewards—up to $1 million, depending on how many ways the prize is split—with care, using it to extend their science, start a company, or land a new job. But even the most dedicated have found it difficult to return to their old routines after being summoned to Stockholm.

Richard Roberts, who shared the medicine Nobel in 1993 for discovering split genes, calls it "the prize that keeps on giving." The torrent of phone calls, media interviews, dinners, speaking engagements, trips, and petitions was a bit overwhelming at first, he says. After an initial fling, he's become much more selective. He's most likely to respond to schools, he says, "because you never know who is going to be in the audience and might decide that science is their life." On the other hand, Douglas Osheroff of Stanford, who shared the physics prize in 1996 with two others for discovering superfluid helium-3, has embraced the larger stage afforded by the prize. Friends began telling him in the mid-1970s that he was a nominee for a Nobel, but it was only after he stopped thinking about it that he got a phone call from the Royal Swedish Academy of Sciences. In an instant, he says, "I knew that my life had been turned upside down."

CREDIT: MATTHIAS RIETSCHEL/AP

Foundation grant. Laureate Günter Blobel is using his Nobel money to rebuild a Dresden church destroyed in World War II.

The phone kept ringing. He agreed to dozens of media interviews; joined a press blitz put on by the National Science Foundation, which has funded his work; visited his old lab in New York with a Swedish film crew in tow; and traveled widely. "Time is absolutely the scarcest commodity in a Nobel laureate's life," Osheroff says. But he has stuck with his decision to "accept the responsibility of becoming a spokesperson for science and my institution and an inspiration for young people."

In her 1977 book, *The Scientific Elite*, sociologist Harriet Zuckerman argues that the Nobel Prizes often "impede rather than ... advance scientific work" by making laureates into celebrities and stealing time from their research. Harold Varmus, president of the Memorial Sloan-Kettering Cancer Center in New York City and former director of the National Institutes of Health (NIH), agrees. A 1989 winner with J. Michael Bishop of the medicine prize for oncogene research, Varmus says he eventually cut back on travel because he felt that "the steam was going out of my research program" in the immediate aftermath of the award—"when you're Miss America."

The prize also paved the way to a new career: Varmus discovered that politicians suddenly wanted his advice. The "pivotal moment" came when former NIH director Bernadine Healy asked him how the government should reimburse institutions for indirect costs spent to support research. "I didn't know a thing about indirect costs," Varmus recalls, adding that he had "studiously avoided" the dean's office and even faculty

1973
Karl von Frisch, Konrad Lorenz, and Nikolaas Tinbergen win the physiology or medicine prize for their pioneering work in ethology.

COLD SPRING HARBOR LABORATORY

1981
Roger Sperry, David Hubel, and Torsten Wiesel win the physiology or medicine prize for their studies of the visual cortex.

Cash award per prize reaches 1 million crowns.

1983 ▲
Barbara McClintock wins the physiology or medicine prize for her discovery of mobile genetic elements.

1989 ▶
J. Michael Bishop and Harold Varmus receive the physiology or medicine prize for the discovery of retroviral oncogenes.

UCSF

1990
Elias Corey wins the chemistry prize for the synthesis of complex molecules.

1992
Dollar value of prize peaks at $1.2 million.