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

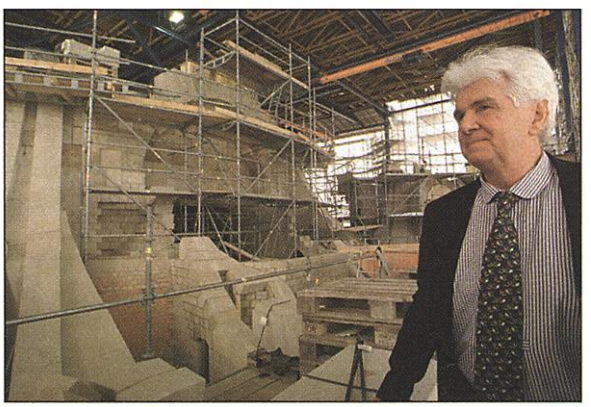
AFTER THE PRIZE

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

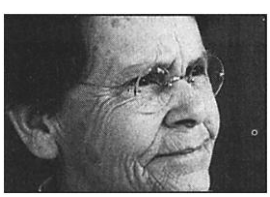
Foundation grant. Laureate Günter Blobel is using his Nobel money to rebuild a Dresden church destroyed in World War II.

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.

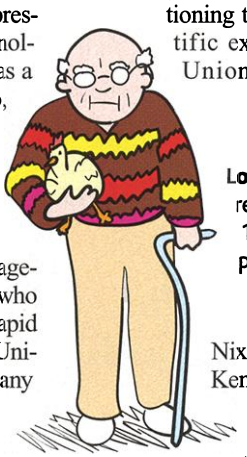
meetings. He says the prize was also key to his selection as NIH director in 1993.

Varmus is one of half a dozen molecular biology laureates who later took over big research institutions. James Watson, who shared the 1962 medicine prize with Francis Crick and Maurice Wilkins for discovery of DNA's structure, has run the Cold Spring Harbor Laboratory in New York for decades and was the first director of what is now the National Human Genome Research Institute at NIH. David Baltimore, a 1975 laureate in medicine, became president of Rockefeller University in New York City and is now president of the California Institute of Technology in Pasadena. And Tom Cech, who was a professor at the University of Colorado, Boulder, when he shared the 1989 chemistry prize for research on RNA, now runs one of the world's richest charities, the Howard Hughes Medical Institute in Chevy Chase, Maryland.

A smaller number have made a management leap into business. Walter Gilbert, who shared the chemistry prize in 1980 for a rapid DNA-sequencing method, left Harvard University to found and run a biotech company in Massachusetts called Biogen. Although he returned to Harvard, he's continued to launch companies, including Memory Pharmaceuticals with Eric Kandel, one of three 2000 laureates in medicine. Winning the prize, Gilbert says, provided "an extra level of independence" that gave him the confidence to try new ventures and the recognition to attract the necessary support.

Others share Gilbert's view of the Nobel Prize as a liberating force. Britain's Max Perutz, who won the 1962 chemistry prize with John Kendrew for work on the structures of globular proteins, says that the honor "greatly increased my self-confidence" and set the stage for "my best work." It also enabled him to buy his first car. William Phillips, a 1997 physics laureate at the U.S. National Institute of Standards and Technology in Gaithersburg, Maryland, thinks the prize has given his studies a practical and fiscal boost. It has become "easier to get funding," he says, and "easier to branch out into things on the edge," like quantum information.

Some Nobel laureates have gotten a different kind of boost from the prize—an elevation to political prominence. Linus Pauling, who won the chemistry Nobel in 1954 for his detailed elucidation of chemical bonds, won the Peace Prize in 1962 after campaigning for a decade against the testing and stockpiling of nuclear weapons. Opposition to the U.S. war in Vietnam put another Nobelist—biologist George Wald of Harvard (medicine, 1967)—on President Richard Nixon's "enemies list." NIH's Julius Axelrod (medicine, 1970) and Christian Anfinsen (chemistry, 1972) attracted attention for petitioning the president to back scientific exchanges with the Soviet Union and later criticizing Nixon's war on cancer. Henry Kendall, one of three physics Nobelists in 1990, used his prize money to help the Union of Concerned Scientists, a group he co-founded that advocates strict controls on nuclear technology.



These researchers lobbied on issues of public policy. Others have used their prominence to back a private cause. Günter Blobel of Rockefeller University, for example, is spending the nearly $1 million from his 1999 medicine prize to rebuild the Frauenkirche, an 18th century church in Dresden destroyed by Allied bombing in 1945, and the Dresden synagogue, destroyed by Nazis on Kristallnacht, 9 November 1938. Blobel glimpsed the Frauenkirche as a child just days before its destruction. The restored synagogue will open next month; the church, 4 years from now. Blobel says he is just trying to combat "cultural Talibanism."

Winning the prize may have slowed his productivity for a bit, Blobel says, but "it hasn't changed the focus of my work." Blobel says that he enjoyed the period of celebrity, but "I have not been seduced into thinking that I should now solve the brain." Others, however, have moved into new fields, including brain research. Francis Crick, after his success with Watson in defining the structure of DNA, has spent 3 decades examining the source of dreams, consciousness, and the biological basis of the soul at the Salk Institute for Biological Studies in La Jolla, California. Donald Glaser, winner of the 1960 physics Nobel for inventing the bubble chamber, left particle physics to work on developing computer models of human vision.

Brian Josephson of the University of Cambridge, after sharing the physics prize in 1973 for his theoretical work on electron tunneling and superconductivity, made a striking change: He turned to full-time study of psychokinesis—the use of mental powers to move matter—and other exotic interests. Josephson says he sensed that the "golden age of condensed-matter physics had passed, and I couldn't be interested" any longer. Getting the prize, he says, "has facilitated my working in unorthodox areas."

In contrast to the field-switchers, many scientists come through the Nobel experience seemingly unchanged and with their productivity undiminished. John Bardeen, for example, shared a physics prize for the discovery of the transistor in 1956 and then shared a second prize 16 years later for a theory of superconductivity. Frederick Sanger, after winning a solo chemistry prize for protein sequencing in 1958, shared another chemistry prize in 1980 for DNA sequencing. As Perutz says, "Great discoveries are wonderful in themselves." But the Nobel adds "something extra."

–ELIOT MARSHALL

This special section includes additional reporting by Michael Balter, Josh Gewolb, Robert Koenig, Andrei Ol'khovatov, Charles Seife, and Ben Shouse.

ILLUSTRATION: C. SLAYDEN

NOBEL NUGGETS

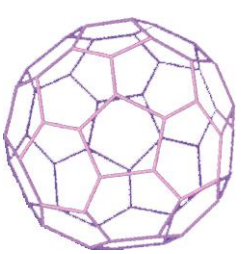
Longest wait. F. Peyton Rous, regarded as a pioneer on the path to oncogene research, published his discovery of a virus that causes cancer in chickens in 1911. He had to wait 55 years, until he was 87, to receive the 1966 prize for physiology or medicine.

1993 ▼
Kary Mullis shares the chemistry prize for the discovery of the polymerase chain reaction.

AP

1995
Edward Lewis, Christiane Nüsslein-Volhard, and Eric Wieschaus are awarded the physiology or medicine prize for their pioneering studies of development.

1996 ▶
Robert Curl Jr., Harold Kroto, and Richard Smalley share the chemistry prize for the discovery of buckminsterfullerenes.



2001
The Nobel Prizes celebrate their 100th anniversary.

Cash award reaches 10 million crowns ($939,000).

[Sources: (1) *The Nobel Prize: A History of Genius, Controversy and Prestige*; (2) Almaz.com]