

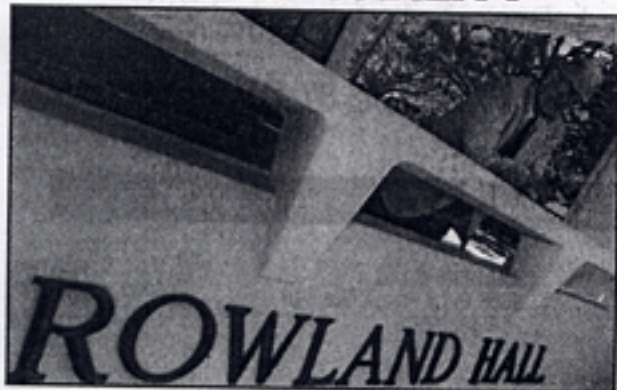
AIR *of* NOBILITY



MICHAEL GOULDINGThe Orange County Register

THE SCHOLAR IN HIS MILIEU: UCI professor Sherwood Rowland, a 1995 Nobel winner, says 'a scientist should always keep busy — and have lots of interests.'

AIR OF NOBILITY



MICHAEL GOULDING/The Register

te. Research. Travel. Lecture. Have a life. University of California, Irvine, mist Sherry Rowland continues to do it all four years after he won a Nobel Prize for exposing a threat to Earth's ozone layer. The scientist, 72, actually expanded his interests to include serving as foreign secretary of the National Academy of Sciences. Rowland brings us up to date. **News 18.**

Rowland, a first baseman, was player-manager of the Oshawa, Ontario, Merchants semiprofessional baseball team in 1950. The team won the Canadian championship.



In 1952, Rowland marries Joan Lundberg in Chicago. They have two children, Ingrid and Jet.

NEWS 18

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THE LIFE AND TIMES OF NOBEL LAUREATE FRANK SHERWOOD ROWLAND



► **1932:** Rowland bats as brothers Sid catches and Dick watches.



► **1964:** UCI's Ivan Hinderaker, left, and Rowland study building plans.



► **1973:** Rowland and Mario Molina review experiment at UCI.



► **1995:** King of Sweden, right, awards Rowland the Nobel Prize.

1927: Born June 28 in Delaware, Ohio, the son of Sidney and Lois Rowland.

1932: Enters first grade at age 5. Later skips fourth grade.

1939: Begins high school at 12. Graduates shortly before 16th birthday.

1945: Enlists in the U.S. Navy.

1948: Earns bachelor's degree from Ohio Wesleyan University, majoring in chemistry, physics and mathematics.

1951: Earns master's degree in chem-

istry from the University of Chicago. Receives doctorate in same subject from Chicago one year later.

1952: Marries Joan Lundberg. Joins Princeton University faculty.

1956: Joins University of Kansas faculty; obtains first research funding.

1964: Named founding chairman of University of California, Irvine, chemistry department, one year before the campus opens.

1973: With postdoctoral researcher Mario Molina, begins studying effect

of chlorofluorocarbons, or CFCs — found in aerosols, refrigerators and air conditioners.

1974: Publishes landmark paper in *Nature* explaining that CFCs can destroy ozone.

1978: Elected to the National Academy of Sciences.

1983: Named co-winner of the Tyler Environmental Prize.

1987: First version of Montreal Protocol adopted by numerous countries, committing them to modest cuts in CFC use and production.

Agreement later strengthened.

1988: DuPont Co. announces that it will stop manufacturing CFCs.

1989: Wins Japan Prize in Environmental Science.

1994: Elected foreign secretary of National Academy of Sciences.

1995: Shares Nobel Prize in chemistry with Molina and Paul Crutzen.

1998: UCI Physical Science Building I renamed Rowland Hall.

Sources: F. Sherwood Rowland, UCI, National Academy of Sciences

Sherry Rowland is having his passport doubled to handle the customs stamps he'll receive this year as he travels 190,000 miles on business — far enough to circle the equator almost eight times.

He regularly flips through *Nature*, *Newsweek* and *Opera News*. But the 72-year-old atmospheric chemist rarely has time to absorb all 50 of his magazine subscriptions, which might not sate his curiosity anyway.

He kibbitzes with his graduate students at the University of California, Irvine. But he makes sure to return to his Corona del Mar home at a reasonable hour to devote more time to his other job as foreign secretary of the National Academy of Sciences, the world's most prestigious science organization.

Rowland retreats to his messy study, where he reads and scribbles notes on scraps of paper about issues the academy might address. Things like biological warfare, water rights in the Midwest, the quality of education in South Africa. He rarely calls it quits before midnight.

Other scientists have coasted after winning a Nobel Prize. But not the indefatigable Rowland, who received science's highest honor four years ago for helping discover

that a class of household chemicals is devouring Earth's protective ozone layer.

The discovery led to passage of the Montreal Protocol, the first major environmental agreement in which countries from around the world agreed to stop using, or curtail production of, ozone-eating chlorofluorocarbons, or CFCs.

Rather than end his career there, Rowland has maintained a schedule that would test the energy of a teen-ager. He uses his free-association style of

thinking to prepare countless lectures, represents the national academy overseas, and conducts research that, among other things, revealed an unexpected source of air pollution in Mexico City.

He's done so in near-anonymity. Although he's an imposing figure at 6-foot-5 with a voice that sounds like distant thunder, Rowland is a self-effacing soul who never seeks publicity and never discusses his Nobel unless asked about it. He stays focused on work.

Rowland will steal a few moments to do *The New York Times* crossword puzzle. But not even that is done purely for fun. He figures the exercise will improve his vocabulary. "You ought to try the ones they print on Friday. They're tough," says Rowland, a prodigy who entered college at 16.

He has such an aversion to wasting time he once flew round-trip between Orange County and Los Angeles so he would surpass the 100,000-mile mark for the year as a United Airlines passenger and earn a cherished perk: a private phone num-

About the only time you won't find him working is at 7:30 a.m. each day when he walks the beach at Big Corona with his wife, Joan. The couple, married for 47 years, talk about everything from their two children to their next trip to Saporì, their favorite restaurant.

Rowland seemed perplexed when asked recently why he doesn't hit the beach more often.

"A scientist should always keep busy — and have lots of interests," Rowland said, as though any alternative was inconceivable.

NOT FADE AWAY

They are words he truly lives by.

Rowland is still director of a research team that's collected or analyzed air samples taken from the North and South poles and about every point in between. Soon, team members will travel to Southeast Asia to take more samples, which will contribute to new articles by Rowland, who already has published more than 350 papers. He is such a revered figure in chemistry that he was asked to sit next to President Clinton two years ago when the government was addressing the issue of global warming.

Rowland also is in his fifth year as foreign secretary of the National Academy of Sciences, an elective body whose membership includes several Nobel laureates. He ping-pongs around the globe, representing academy interests. In the next four months alone, Rowland will visit China, Norway, Egypt, Japan and Thailand.

He also still has an appetite for policy-oriented debate. Which is fortunate. He expects to receive an argument for his emerging view that the United States should raise gasoline prices 10 to 15 cents per year for up to 15 years to force people to drive less, reducing the release of carbon dioxide into the atmosphere.

He views the "carbon tax" as one method of limiting global warming. Rowland says increased warming could damage agriculture in a world where the population count exceeded the 6 billion mark in July.

"The tax would be returned to consumers annually, so it wouldn't devastate the economy," says Rowland. "It's the right thing to do. The figures show that the Earth is getting warmer."

PRODIGAL SON

Rowland knows a thing or two about figures, or mathematics. His father, Sidney, taught math at Ohio Wesleyan University, the cultural beacon of their hometown of Delaware, Ohio.

At age 12 — when Sherry was a freshman in high school — his father gave him a trigonometry book to see if he could handle its equations. He not only understood the subject, but loved it. Soon, the skinny teen-ager called "Bones" was helping his father grade college-level math papers.

The young Rowland also loved naval history. He built model warships, then devised sophisticated math equations to figure how much bombing each ship could take before it would sink.

He might have been branded a geek right there if not for another passion — athletics, especially baseball and basketball. Rowland is loath to discuss his personal feeling about many things. But he proudly volunteers that he never batted less than .330 a season in baseball at the University of Chicago, where he earned his doctorate in chemistry.

Rowland entered the university in 1948, when the campus was abuzz with the work of the great physicists and chemists who'd developed the atomic bomb during the Manhattan Project. Five of his instructors either had won, or would later receive, a Nobel Prize. The future recipients included chemist Bill Libby, a charismatic man who didn't mince words.

"I see you made all A's in undergraduate school," Libby told Rowland. "We're here to find out if you're any damned good."

Libby became Rowland's mentor and taught him a lesson that he's applied to his own work: "Great scientists work at the edge of what's known. If lots of other people are doing your kind of experiments, you're not on the fringe."

RISING STAR

Rowland left Chicago and prospered, establishing an impressive research record at Princeton University and the University of Kansas. University of California officials noticed and hired him in 1964 to create a chemistry department at its Irvine campus, which was to open a year later.

"The 405 Freeway didn't extend below Long Beach back then, and you could look south of Costa Mesa and not see any lights," Rowland recalls.

He remained little known outside scientific circles until 1974, when Rowland and his postdoctoral student, Mario Molina, published a paper in *Nature* that said CFCs could drift into the upper atmosphere and undergo a chemical reaction that would destroy ozone, which shields humans, plants and animals from harmful levels of ultraviolet radiation. The finding jarred the public because CFCs were released as gases every time aerosol spray cans were used to apply such things as hairspray and deodorant.

The finding was quickly confirmed by other scientists, some of whom joined Rowland in calling for a ban on CFCs. That angered U.S. chemical manufacturers, who saw CFCs as a \$3 billion-a-year industry, not as a health threat. The leading CFC maker, DuPont, took out full-page newspaper advertisements, attacking Rowland's credibility by calling the CFC problem a hypothesis. *Aerosol Age* magazine said Rowland must be an agent of the Soviet KGB to espouse such a wild idea.

Rowland hunkered down, churning out corroborating research with the same diligence that had disturbed his son Jeff's sleeping habits years earlier.

"He'd keep me awake at night pounding away on his typewriter, writing a million miles an hour," said Jeff Rowland. "I had to learn to fall asleep to the rhythm of the keys."

Rowland also roamed the world, defending his work while gently deflecting insults.

"That's Sherry's style," said Ralph Cicerone, UCI's chancellor and a fellow chemist. "He has an overriding sense of calm and the patience to debate an issue point by point."

ACHIEVING NOBILITY

Rowland's work withstood the criticism. He was awarded the prestigious Tyler Environmental Prize in 1983 and the Japan Prize in Environmental Science six years later.

"I think Dad felt a sense of vindication," Jeff Rowland said. "But he didn't expect that he'd win the Nobel because his work was seen as applied science. Basic research tends to get the prize."

But win he did. On Oct. 11, 1995, at 6:33 a.m., the Swedish Academy of Sciences called to say that Rowland would share the Nobel with Molina and fellow chemist Paul Crutzen. Rowland says he responded by simply saying, "Oh, that's great." Actually, the scene was more frenzied.

Joan Rowland says, "I burst into tears of joy. Then Sherry burst into tears. We called our son, who burst into tears, and our daughter, who did the same. Everyone was in tears."

At that point, Rowland could have asked for such perks as a larger office, which he needs. He's a pack rat whose desk is smothered with papers. It's a bonfire waiting to happen.

But Rowland didn't ask for larger quarters. And Cicerone isn't surprised. "It'd take four days to pack up all his belongings and move, and Sherry wouldn't want to waste that much work time."

Rowland did take a day off in October when UCI, at the request of the faculty, held a celebration as it renamed the science building where he has worked for 30 years Rowland Hall.

The gesture touched him deeply.

"After his family, the most important thing in my father's life is chemistry," Jeff Rowland said. "I wouldn't be surprised if he dies in the lab."



SIGN OF STATURE: UCI professor Sherwood Rowland, who did pioneering research on the effect of CFCs on the atmosphere, sits with President Clinton and Vice President Gore in 1997 at a White House conference on climate control.