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Dr. Edwin P. Plueddemann

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In Memoriam

Dr. Edwin P. Plueddemann

Scientist, Inventor,
Teacher, Author,
Consultant and
Counselor

1916-1991



It is my sad duty to report that early on March 17, 1991 Ed (Edwin P.) Plueddemann lost his fight with cancer.

Ed "I can stick anything to anything" Plueddemann was a legend in his own time. He was the world's foremost expert on silane coupling agents and much more. His nearly 75 years was filled with every aspect of a truly meaningful life.

One way to characterize his life is to list a few of his accomplishments. If you knew Ed the Scientist, the list would look like this.

1. Over 100 U.S. patents (96 with several still pending).
2. Five Best Paper Awards, SPI/Composites Institute.
3. Society of Plastics Engineers Man of the Year, 1971.
4. American Chemical Society Creative Invention Award, 1984.
5. American Chemical Society, Midland Section, Science Promotion Award, 1984.
6. NASA Creative Development/Innovation Award, 1984.
7. American Chemical Society Award for Creative Invention, 1984.
8. Plastics Hall of Fame, 1988.
9. International Award in Plastics Science Technology, SPE, 1988.
10. Adhesion Society Award for Excellence in Adhesion Science.
11. Author of book, "Silane Coupling Agents" 1982, revised 1990.

12. Editor of book, "Interfaces in Polymer Matrix Composites."
13. Editorial Board—Journal of Adhesion Science and Technology.
14. Lecturer—Four major courses on adhesion, done yearly, plus others.
15. Thirteen chapter contributions in books.
16. Thirty-three journal articles.
17. Thirty-nine professional society presentations.
18. Silanes and other coupling agents—A Symposium honoring Dr. Edwin Plueddemann on April 3–5, 1991.

If you only knew Ed the Scientist then you really didn't know him. The following is a list of what *he* would suggest as his major accomplishments.

Husband to Margaret Mary (surviving Ed) for fifty years. Father of four children, three of whom have been missionaries; grandfather; pastor of the Olson Community Church; Sunday School teacher and counselor.

Another way to characterize Ed is by his hobbies. The first was music, which permeated his entire life. From childhood he was in a variety of singing groups, from church choirs (sometimes he led) to the Dow Choir with its very professional sound. He played the trombone in the Midland Symphony Orchestra as well as the Pear Wood Recorder. He would play this for anyone who would listen and also with a recorder ensemble. His love of the outdoors included skiing, hunting, hiking and just getting back to nature. He hiked with his friends, his family and with youth groups. He also loved the game of golf. Golf gave him a chance to commune with nature, it was a "fun" game to him. He also enjoyed winning. He golfed until the week that he died, a week spent on a golfing vacation with his brother in Florida. He loved the challenge of the stock market, but would only tell of the times that he outsmarted it.

He was born on April 1, 1916 in Galion, Ohio. His undergraduate work was done at Baldwin Wallace College in Berea, Ohio where he received a B.S. in Chemistry in 1938. He then moved to the Ohio State University, receiving a Ph.D., also in Chemistry, in 1942. He was associated with Westvaco Chlorine Products in New Jersey from 1942–1947 and with Libby Owens Ford, Plaskon Division, in Toledo, Ohio, for the next eight years. There he initiated what was to become a lifelong scientific endeavor—the research and development of organosilicon compounds and the application of these materials to adhesion problems. He then moved to Dow Corning Corporation, in Midland, Michigan, where he worked for the next thirty-five years.

During those thirty-five years at Dow Corning, Dr. Plueddemann worked exclusively in a scientific role and advanced to the distinguished role of Scientist. He concentrated his research on organosilicon chemistry, particularly silane coupling agents. He retired the first time at age 68. He returned to Dow Corning as a consultant for one year and then was rehired into the company as the oldest new employee. He retired again at 73. At that time he was awarded the Scientist Emeritus Status and given an office and lab in which he worked until his death.

Edwin Plueddemann had the title "Scientist" at Dow Corning Corporation. That meant that he had a lab and a couple of assistants for most of his career and could work on his own. It also meant that as a bench chemist with that title, he had no

management or supervisory responsibilities. Dr. Glue simply put out more innovative work than one or two people were expected to accomplish. His experiments, as all else in his life, were not strictly conventional.

Were you to walk through Dow Corning's labs or to sit down for lunch in the cafeteria you'd soon find that almost everyone knew Ed Plueddemann and had an Ed Plueddemann story.

On a Sunday in August of 1982, a Dow Corning employee was driving on a major highway when he passed a burly fellow hitchhiking, with his golf bag. The fellow sure looks like Ed Plueddemann, he thought. Couldn't be. It was. His vehicle—Plueddemann has a penchant for old cars and vans—had broken down while he was driving to the airport to catch a plane. (At that point he was spending nearly half of his time traveling to meetings and speaking engagements.)

"It was a beautiful day" he said. And he figured that he would see someone he knew "pretty quick". He didn't and it took several rides to reach his destination. He was comfortable hitchhiking, having done much in the 1930s. Moreover, he liked to talk to people. So what's the big deal, he wondered.

It was typical of the man that he didn't really consider the incident worth noting, despite the fact that as another Dow Corning man says, "He could have called any of fifty people who would have jumped in their cars and gone for him!"

He solved his own problems. When the tail light of his car cracked and fell off, he grabbed a red plastic wrapper from a package of wieners and fitted it over the absent lens. In this case, though, it was a short lived solution. Early the next morning, he looked out to see a fat racoon ambling off into the woods with the meat-scented wrapper. Incongruities like that—a racoon stealing an "auto part"—appealed to Plueddemann's sense of humor.

Some like to start Ed's history with his grandfather, who emigrated from Germany, went to the University of Michigan, and became a pastor in the German Methodist Church. His father went to Ohio State to become an engineer. But he also became a German Methodist minister.

Even in high school Ed was interested in the sciences, and thought that he would like to be a chemist. During his senior year he lived with the Mayer family where George Mayer was a chemist. His family moved and didn't want him to drop out and start the last year in another school. Plueddemann visited George at his lab and he liked what he saw. "It was the work itself, especially the lab work where I could demonstrate things . . . it was logical . . ." It was the early exposures that started Ed on the paths in science and christian endeavors. The paths were not separate, but overlapping throughout his life.

In 1955 Mel Hunter (director of Research at Dow Corning Corporation) asked the president of Allied Chemical about Ed. He was told to take him . . . "Plueddemann has silicones in his veins instead of blood."

At Dow Corning Corporation he rose through the positions of chemist, project leader, group leader, supervisor, and senior development specialist before getting what he called, "My own chemistry set. Just give me my own chemistry set and let me go." He considered himself, "an experimental laboratory chemist," rather than a, "theoretical mathematical chemist." He explained, "I like to run out a lot of work. Sometimes my method of attacking something is just doing ten times as much

work as some other people might do.” “I like to get a lot of data, try a lot of different variations, so I get the feel of the thing. These chemicals and things, they are not going to argue with us if we watch them and find out what they’re doing. The theories are so often wrong with insufficient data.”

His research on bifunctional molecules paved the way for the bonded-in-place antimicrobials now used to “odor proof” men’s socks and other textiles and his coupling agents are in anti-corrosion anti-freeze.

Gary Stark worked with Plueddemann as a lab technician from 1961 through 1981 and clearly delights in talking about the scientist.

“Dr. Glue was always dreaming up a new screening test . . . for anything,” says Stark. “For example, we have one we call the Plueddestron. Instead of a \$30,000 or \$50,000 testing machine in the lab, to make a quick determination of adhesion, a tiny C-clamp, pail, and glass microscope slides are used.” says Stark. The slides are bonded to the material under test, the pail is suspended from the faucet by the specimen, and water is poured in until the bond fails. It’s a quick way to find out if the adhesion capabilities are worth studying further. “If it won’t work on glass, it won’t work on steel or aluminum.” Not everything is that simple, though. An experiment to see how barnacles adhere to a battleship hull and whether a silicone rubber might keep the hull clean involved several 300 lb. hull sections installed in the crowded lab.

Dr. Glue has studied how tire cords adhere to rubber in tires; how films adhere to solar cells; how corrosion and sound-deadening materials adhere to the underside of a car.

It was not unusual for Plueddemann to get 30 or more telephone calls per week from researchers who needed help with their adhesion problems.

While Ed’s work was fruitful for Dow Corning, as seen in the products, patents and publications, many of his administrators were certain that Ed planted an equal number of technical seeds with his non-Dow Corning colleagues, seminar students, and competitors around the world. When you asked Ed for help it was difficult for him to say no.

As indicated earlier Plueddemann’s religion was a central part of his life, and it greatly influenced his family. He met his wife, Mary Margaret, in a church choir during his school days. She is the church organist, Sunday school teacher and the pastor’s top supporter. His son Jim was a missionary in Africa for fourteen years, eventually taking a doctorate in education and becoming acting dean of Wheaton College’s graduate school near Chicago.

One of the scientist’s daughters, Kare, was in Nairobi, a missionary like her husband. Another’s husband is also in the ministry. Three of Plueddemann’s grandchildren were born in Africa.

He preached every Sunday that he was home at the small Olson Community Church and was a member of the Gideons Bible-Distribution Society. As such, he visited jails to spread the gospel and to give support. The scientist said, “I right away introduce myself and make it clear that I have no pull with the judge or the sheriff. So there’s no need to pretend, to get favorable treatment.” Instead he told the inmates, “I just want you to know we’re still interested in you. God has been

good to me, and I want to help you.” He added, “there are a lot of them that are anxious to talk, just to discuss their needs, personal relationships with God.”

Some stories suggest Ed was a bit determined in his attitude. After a 1979 trip, Plueddemann walked in his front door and collapsed. He had had a heart attack while on the trip and had ignored it. Just three weeks later, he was hustling by on skis when a neighbor saw him and alerted his wife. That ended that escapade. But both his wife and he were avid cross-country skiers.

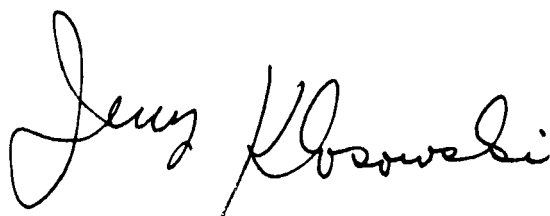
About retirement said Plueddemann, “I can’t see why anyone in good health who enjoys his work would ever want to retire.” Plueddemann saw work as a joyful experience. “It is strange that so many are unhappy in their work, and see no challenging purpose in gainful employment.” What they need, he said is a “satisfactory view of themselves as part of a big picture.”

When Ed’s cancer was diagnosed a few years ago it set him back a bit. The chemotherapy was bothersome, but as his coworker and friend Peter Pape would testify, it didn’t keep him down for long. He was soon back in the lab, out on the road on the lecture circuit and back on the golf course. We all could see Ed walk a little slower and get a little thinner, but while he stepped a little slower he didn’t miss a step. His religion and his science never went wanting, nor did anyone who needed his help. He was there to work and do what he could. In the months before he died he lectured, wrote another paper, and received two more patents. The week before he died he went with his brother on a golfing vacation to Florida.

The big picture for Plueddemann was man in the image of God, pursuing an endless universe of understandable phenomena. Between Newton’s views of himself as a boy tossing pebbles into the sea and watching the ripples spread while the oceans remained unexplored, and a recent American Association for the Advancement of Science president who concluded that “endless horizons no longer exist,” Plueddemann says, “I feel more akin to Newton.”

Thanks to all of you who gladly helped put this material together and to Industrial Chemical News which once carried some of the above information.

From one of many of Ed’s fellow Scientists who was also a close friend.

A handwritten signature in cursive script that reads "Jerry Klosowski". The signature is written in dark ink and is positioned above the typed name and affiliation.

Jerry Klosowski
Dow Corning Corporation
Midland, MI, U.S.A.