GLENN F. KNOLL

1935–2014

Elected in 1999

"For contributions and technical leadership in the field of ionizing radiation detection and application."

BY DAVID WEHE
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GLENN FREDERICK KNOLL, professor emeritus of nuclear engineering and radiological sciences at the University of Michigan, died April 20, 2014, at the age of 78.

He was born on August 3, 1935, to Reverend Oswald and Clara Bernthal Knoll. He earned a BS in chemical engineering from Case Institute of Technology in 1957, master's from Stanford University in 1958, and PhD in 1963 at the University of Michigan, where he joined the faculty.

A gifted teacher and brilliant researcher, Dr. Knoll was a mentor and role model for generations of students. Colleagues claimed they made careers out of his innovative ideas by turning them into applications in their fields such as nuclear medicine, radiography, oil well exploration, nuclear physics, environmental stewardship, and homeland security.

From 1979 to 1990 Professor Knoll chaired the Department of Nuclear Engineering, whose size and prestige, under his leadership, matured to its current level. After returning to the faculty ranks, he initiated a new research field of room-temperature semiconductor radiation detectors and led this effort until tapped to serve as the interim dean of engineering (1995–1996). He then returned to his true calling, teaching and research, until his retirement in 2001.

Former University of Michigan president and colleague James Duderstadt said, "Glenn Knoll left his legacy for science with a half century of world leadership in nuclear measurement. But he was also fun-loving and kind, he took young faculty and graduate students under his wing."

Dr. Knoll's contributions have been recognized widely. In addition to his election to the National Academy of Engineering, he was inducted as a fellow of the Institute of Electrical and Electronics Engineers (IEEE), the Institute of Medical and Biological Engineering, and the American Nuclear Society (ANS). He was also honored with the Glenn Murphy Award of the Nuclear Engineering Division of the American Society for Engineering Education (1979), the ANS Arthur Holly Compton Award in Education (1991), the IEEE Career Outstanding Achievement Award, and the IEEE Third Millennium Medal.

He participated in the formulation of post-9/11 planning through ideas published in the 2002 National Research Council report *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism*.

Dr. Knoll enjoyed the technical fraternity of colleagues and travelled internationally to participate in their lives. He served as an International Atomic Energy Agency reviewer of international programs and taught his radiation detection course on every continent but one. As editor of the journals of his field, he was universally known and respected. His textbook, *Radiation Detection and Measurement* (Wiley, 4th ed., 2010), remains the standard reference of the field after four decades and is available in multiple languages.

On the day of his death Dr. Knoll was as active as ever, reviewing proposals and writing white papers to meet imminent deadlines. He sent final ideas for the June 2014 Symposium on Radiation Measurements and Applications (SORMA), the international conference that he launched nearly 50 years ago.

In talking with former colleagues and students it became clear that Dr. Knoll had a playful, competitive spirit. A man of innumerable talents he enjoyed travelling, music and singing in the glee club, and driving his Harley-Davidson. He played

softball on the Nuclear Nine (as a solid third baseman) and had a passion for fencing, paddleball, and racquetball. He also enjoyed a monthly game of poker.

Recollections of Son Thomas F. Knoll

My Dad introduced me to nearly every part of my life, from my profession to my hobbies. He was an engineer, which he described to me as using math and science to make useful stuff, and gave me my first introduction to all three.

My family used to take many long car rides together. At least they seemed long to a little kid sitting in the back of the car. We travelled back and forth from Ann Arbor to Frankenmuth to visit my grandparents, and during the summer we spent a week or two at my grandparents' cottage on Houghton Lake. To pass the time on these car rides, my Dad would make up math problems for me to try to solve in my head. They started out as simple arithmetic problems—multiplying two-digit numbers together, etc.—and as I got older they progressed to problems in algebra and geometry.

Eventually I got good enough at solving these problems that Dad could no longer make up problems in his head that were hard enough to challenge me. But the math teaching did not stop then, and we switched over to pencil and paper. He taught me the basics of differential calculus when I was 13.

When Dad was writing the first edition of his textbook, I was able to pay him back for some of his math instruction by solving some equations for his book, including a fourth-degree polynomial that still appears in the current edition.

He also introduced me to science. One strong memory I have is a night at the cottage on Houghton Lake, which is far enough from big cities that the view of the stars at night can be spectacular. On one clear night he took me out on the dock, and using a flashlight as pointer taught me the constellations, which I remember to this day.

He kept all his issues of *Scientific American* magazine organized by year in cardboard library shelf boxes. I spent many hours learning science by reading them while growing up.

Only recently did the availability of digital online archives convince him that it was OK to throw them out.

The third part of engineering is "making stuff." One my favorite memories is of Dad taking me to see one of the greatest feats of engineering ever, the Saturn V rocket, and the launch of Apollo 17. He took me along to a conference in Miami and afterward we drove up to Cape Kennedy to watch the launch. The minimum age for the VIP viewing area next to the vehicle assembly building was 16. I was only 12 at the time so he told me to "act old." I was lucky that by that time I was nearly six feet tall, so nobody called us on it.

In the basement of our house he built a wood shop, which he taught all three of his sons to use. I have fond memories of making furniture together, including a couple of pieces that are still in my mom's house.

I started to make model airplanes, at first plastic miniatures like Dad used to make and later radio-controlled gliders. This started a lifelong love of aviation. As a hobby, I have a pilot's license and fly my own airplane.

My dad taught me how to play golf, a game I love playing. This is one subject where he was probably not the world's best teacher. While I eventually got good enough to beat him, I'm fighting a slice that I think I copied from his swing.

But the greatest influence he had on my life was in my profession. He provided my first introduction to computer programming. I remember a Saturday afternoon at a computer lab watching him write a simple computer program in FORTRAN to compute mortgage interest. He showed me the printout of the program and explained the steps. He said I would probably be good at computer programming. He was right.

The other part of my profession that he introduced me to was photography. He gave me an Argus rangefinder camera when I was about 10, and taught me to develop film and make prints in a darkroom we built together in the basement. I combined my knowledge of computer programming and photography when John and I created Adobe Photoshop.

So I can honestly say that I owe the start of nearly everything in my life to my Dad. Thank you, Dad.

Recollections of Son John A. Knoll

Dad was a great man. A man of great warmth and goodness, humor, generosity, and of course an immense intellect. He was a man who was extraordinarily productive with a powerful work ethic. He set the bar very high, and every day I aspire to live up to his example.

I owe much of who I am today to the influences of the household in which Mom and Dad raised me. My brothers and I grew up in a loving and stable environment, one that encouraged curiosity, experiment, and creative expression.

What we learned from Dad, both by example and direct tutorship, was that it was possible to succeed at almost any endeavor if you were willing to make the investment and do the work. Dad behaved as though there were no fields that were beyond our abilities to master. We learned to question assumptions, be skeptical, and not accept the status quo.

I've been living in California for 34 years now and I work with many people from all over the world. One thing I've noticed from a thousand conversations is that people who grow up in cold climates develop indoor hobbies. Growing up in Ann Arbor, Tom and Pete and I had a lot of indoor hobbies. More than half of those began by observing Dad engaging in one of them. We'd take an interest, try it ourselves, and they would become our hobbies too.

For me, five hobbies I picked up from Dad led pretty directly to the career I've so happily engaged in my whole life.

Model Making

Dad used to build model kits of World War II aircraft. He was very good at it. They were beautiful and captivating with lots of intricate detail. I was fascinated by them and started trying to learn that skill. It took me nearly a decade to be any good at it, but eventually I got to be good enough that I worked professionally as a model maker for the first four years of my film career.

Still Photography

Dad built a darkroom in our basement and taught us the basics of photography, including how to develop film and make prints. A favorite memory of mine is when he bought me my first really good camera. I had learned on a super-bare-bones camera and was ready for something more sophisticated.

We went to the local camera shop where we browsed the selection. The salesman, seeing a 14-year-old kid, kept showing us simple starter cameras that didn't have the features I wanted. Looking down into the case, I spotted a camera that looked like it had everything I wanted: full manual, various automatic settings, double exposure mode, etc.

"What about that one?" I asked.

"Oh, you don't want that camera. You'd have to be a nuclear physicist to use that camera!"

Needless to say, that was the camera we bought. I loved it. It served me well for 25 years.

Electronics

When an appliance like a television broke we would take it to the basement workshop and fix it. I learned the basics of analog circuitry that way and developed a great interest in digital electronics that I still dabble in today.

Computer Programming

In the spring of 1978 Dad got an Apple][computer that he used for developing and testing signal processing algorithms. It was this really cool and exotic bit of high technology right there in our house. He showed us how it worked and encouraged us to learn how to use it. Boy did I ever take advantage of that!

That early exposure and encouragement led pretty directly to a lifelong passion for writing software tools and pushing the limits of using computers for creative expression. It also led pretty directly to my getting involved with Thomas in the development of Photoshop.

Making Stuff in the Shop

Dad had a nicely equipped workshop in the basement. He used it to fix things, build some really nice furniture, and generally engage in a lot of DIY. We got recruited to help on the bigger projects. That had a pretty big effect on me, too. I got to be very comfortable around woodworking and metalworking tools and learned that making things for yourself wasn't a big deal. Again, this has served me very well in my professional life.

All of those hobbies came together in what I ended up doing for the last 35 years in visual effects for film. I've seen a lot of success in film, but so much of it came directly from Dad's influence and example. Glenn is still very much alive in who I am, how I approach problems, and how I see the world.

When someone they love dearly passes, a lot of people express regrets about all the things they didn't get to say, the events they wish that person had been there to share, the regrets that they didn't make a greater effort to include them in their lives. I have none of those regrets. Dad knew how much we loved him. He was there to share in all of the most important events of our lives, and it was wonderful.

Glenn married Gladys Hetzner on September 7, 1957, and she survives, as do their three sons: Thomas Frederick, of Pacific Palisades; John Andrew (Jennifer), of San Rafael, CA; and Peter Glenn (Carola), of Andover, New Jersey. He delighted in grandchildren Andrew, Hannah, Harlow, Lisa, Alexander, and Jane. Also surviving are a brother, Alan Knoll (Ruth); sister, Marie Kaiser; in-laws, Judith and David Berger, Virginia and Wayne Hatwich; and many nephews and nieces.

We have lost a legendary friend and colleague.