Haruo Tashiro, Cornell University Professor Emeritus in the Department of Entomology at the New York State Agricultural Experiment Station, passed away peacefully in Golden, Colorado at the home he shared with his son, Steve, and Steve’s wife, Patricia. He was 92 years of age. “Tash,” as he was affectionately called by his many friends and colleagues, was a world leader in the biology and management of insects and mites on turfgrass and woody ornamentals.

Tashiro received his B.S. degree (1945) in Botany and Zoology from Wheaton College in Illinois and his M.S. degree (1946) and Ph.D. degree (1950) in Entomology from Cornell University. He was a research entomologist with the U.S. Department of Agriculture (USDA) in Geneva, New York, from 1950-63, before becoming the investigations leader and research entomologist with USDA at Riverside, California. In 1967, he returned to Geneva to serve as Professor of Entomology until his retirement in 1983.

Throughout his active scientific career, Tashiro produced numerous publications on the biology, ecology and management of insects affecting horticultural crops and turfgrass. Perhaps best known is his 1987 publication, Turfgrass Insects of the United States and Canada. This book was the first comprehensive reference to bring together under one cover a discussion of practically all insects and other arthropods destructive to turfgrass in the United States and southern Canada. It soon became the standard reference for the subject. The book was revised in 1999 by Tashiro, his former graduate student, Pat Vittum, and Mike Villani, who succeeded Tashiro as the turfgrass and soil ecologist at Cornell.
Among his many accomplishments, Tashiro conducted seminal studies on the European chafer (*Rhizotrogus majalis*) during the 1950s and 1960s, elucidating the biology of the insect, identifying trapping techniques, and identifying management strategies. He also studied the grass webworm (*Herpetogramma licarsisalis*) and the fiery skipper (*Hylephila phyleus*) during sabbatical leaves in Hawaii.

Tashiro was not only an excellent scientist but an accomplished artist. His detailed drawings of insects, his skill in cartography and his photos grace the pages of his books on turfgrass insects. His artistic skills were recognized by many, including his colleagues Paul Chapman and Siegfried Lienk. Since they were not able to find an artist who could provide the morphological accuracy necessary to illustrate a book on insects affecting apples in New York, they asked Tashiro if he was willing to try. After a few trial paintings, they were pleased with the efforts and asked him to collaborate. From 1963-68 Tashiro prepared watercolor renditions of 56 species of tortricid moths whose larvae damage leaves and fruits of apples. The book, *Tortricid Fauna of Apple in New York*, was published by Cornell University in 1971 and remains a classic.

Tashiro was born in Selma, California, on March 24, 1917. During his youth, Tashiro was among the approximately 110,000 Japanese Americans interned in camps during World War II because of their ancestry—an act the federal government apologized for in 1988. In 1942, he married Hatsue Morimitsu whom he had met at their church in Sacramento. Rumor has it that he courted her by bringing gifts of vegetables from his family’s farm in nearby Orosi. Tashiro and his wife moved east to Cornell so he could obtain his advanced degrees at Cornell University and together developed many long-lasting friends in the area. Tashiro always considered Geneva his home and he and Hatsue raised three children there. He was involved in many civic organizations including devoting many hours to leadership activities in the Presbyterian Church. Tashiro was an avid golfer, even into his late 70s, and was a renowned horticulturalist who created an arboretum around his house.
He is survived by his daughter, Elaine Gerbert and her husband, Pierre (Lawrence, Kansas); his son, Steve and his wife Patricia (Golden, Colorado); and his daughter, Wendy (Byron Bay, Australia). Tashiro was predeceased by Hatsue on April 7, 2006. She was buried in Dinuba, California, where Tashiro will also be laid to rest. Tashiro will be remembered as a gentleman, excellent scientist and an inspiration to his family and friends.

James Hunter, Chairperson; Anthony M. Shelton, Pat Vittum
Dr. Maurice J. Tauber, an emeritus professor, Department of Entomology, Cornell University, Ithaca, NY, died Oct 6, 2014 at the age of 82. At the time of his death, Dr. Tauber was a visiting professor/scientist and associate at the UC Davis, Department of Entomology and Nematology, Davis, CA.

Dr. Tauber received his bachelor's and master's degrees at the University of Manitoba, Canada and his doctorate in entomology from the University of California, Berkeley in 1966. Dr. Tauber joined the entomology faculty in Ithaca in 1966, served as Department chair from 1981-1986, and retired in 2000. In addition to being granted emeritus status, he was also appointed as Graduate School Professor.

For nearly 50 years, Dr. Tauber shared a prolific scientific career with his wife, Dr. Catherine (Kady) Tauber, whom he met at UC Berkeley. The scope of their research embraced ecological, evolutionary, and behavioral questions, and involved both beneficial and pest species from eight insect orders. The research yielded fundamental insights into insect photoperiodism, dormancy, development, and speciation. The findings have a broad impact on applied problems, for example in the management of diverse crop production systems and natural ecosystems. Dr. Tauber published approximately 200 papers, many with Kady, in entomological journals, as well as in Nature, Science, and Annual Reviews. He had two papers in press, and was working on several manuscripts in the weeks before his passing. After retirement and when he became associated with UC Davis, his research emphasis shifted to the comparative biology of New World green lacewings.

He also wrote numerous book chapters, and a textbook Seasonal Adaptations of Insects (1986, co-authored with Kady and Dr. Sinzo Masaki of Japan). The book continues to serve as a stimulus and resource for research on insect seasonality: the underlying ecophysiological and genetic mechanisms; its role in the evolution of insect life histories and speciation; and its importance to insect pest management.
Dr. Tauber was major professor for a number of graduate students who have continued their careers in entomology, including Drs. Jim Nechols, John Obrycki, John Ruberson, Gilberto Albuquerque, Lindsey Milbrath, Yin-Fu Chang, and José I. Lopez-Arroyo. He was a dedicated mentor and enthusiastic supporter of his graduate students, as well as undergraduates who worked in the Blauvelt Lab at Cornell University. Dr. Tauber was also a willing mentor for the numerous assistant professors who joined the Cornell Entomology Department during his years as a faculty member. At UC Davis, he advised numerous graduate and undergraduate students in an informal capacity.

Dr. Tauber was a Fellow of the American Association for the Advancement of Science (AAAS), the Entomological Society of Canada, and the California Academy of Sciences. He served on the Governing Board and several editorial boards of the Entomological Society of America. For more than 20 years he was active on the editorial board of the European Journal of Entomology. He was also a research associate of the B.P. Bishop Museum in Honolulu, and a member of numerous scientific societies.

The International Organization of Biological Control (IOBC) recognized Dr. Tauber’s work with two awards that he shared with his wife Kady: the IOBC/Nearctic Regional Section Distinguished Scientist Award (2002) and Honorary Membership – Global IOBC (2012).

Dr. Tauber is survived by his wife Kady who continues to reside in Davis, CA. He is also survived by their sons Paul and Michael and their daughter Agatha.

Elson Shields, chair; Arthur A. Muka
Bud Christopher Tennant, James Law Professor of Comparative Medicine, had a distinguished career as Professor at the College of Veterinary Medicine for more than 41 years. Dr. Tennant achieved remarkable success as both a clinician and as a comparative medical researcher. Bud’s success in comparative research likely equals that of any veterinary school faculty member in North America. Related to his long-standing and highly successful research using woodchucks as a model for human viral hepatitis, he was the 2016 recipient of the highly prestigious Baruch S. Blumberg Prize awarded by the Hepatitis B Foundation.

Dr. Tennant was born, November 10, 1933, in Burbank, California and was raised in the western part of the San Joaquin Valley where his father was a foreman in the Kettleman oil fields. Dr. Tennant spoke frequently and fondly of his parents, and of his many adventures growing up in the Kettleman North Dome Association community. He also frequently told the story about his parents growing up in Kansas a very short distance from each other but not knowing each other until dating age. Bud attended elementary and high school in nearby Avenal California. He began his pre-veterinary education at San Jose State University but transferred and received his undergraduate degree from the University of California at Davis. In 1955 Bud enrolled in Veterinary School at the University of California, Davis and received his doctorate of veterinary medicine (DVM) degree from U.C. Davis in 1959. He was extremely proud to be a U.C. Davis graduate (two times) and was particularly fond of the many life-long friends he made there. He and his wife, Priscilla, would frequently return to Davis for Veterinary School class reunions. In 2016, shortly before his death and while being treated for pneumonia in Strong Memorial Hospital in Rochester, New York, Bud’s classmates who were attending their 57th DVM class reunion called him from Davis to pass along their best wishes and to express their fondness for him. This call apparently brought tremendous joy to Dr. Tennant and raised his spirits beyond what medicine could do. Following veterinary school graduation, Dr. Tennant was for one year a Standardbred equine practitioner in California and Ohio.

From 1960-1961, Bud served as a 1st Lieutenant in the United States Army Veterinary
Corps where he was assigned to the National Aeronautics and Space Administration project. The following year he conducted research on wound healing at Walter Reed Army Institute of Research in Washington, D.C. and later in the Germfree Research Program at Albert Einstein College of Medicine. While he was a 1st Lieutenant at the Walter Reed Army Medical Center, he met dietitian Captain Priscilla Trayers, who was a higher-ranking officer than Bud. Priscilla and Bud married in 1963 and Dr. Tennant was always quick to tell the story that his life-long partner was someone who literally outranked him!

After completing his Army commission, Bud returned to the School of Veterinary Medicine, University of California at Davis in 1962 where he was a faculty member in Large Animal Medicine for 10 years. In 1968-1969, Bud completed a Research Fellowship in Medicine in the Gastrointestinal Unit at Boston’s Massachusetts General Hospital and this experience helped provide the groundwork for Bud’s 40 years of work in comparative gastroenterology and hepatology. In 1986, the School of Veterinary Medicine at University California-Davis awarded Dr. Tennant the U.C. Davis Alumni Achievement award in recognition of his many contributions to both veterinary medicine and medical research.

The Cornell University College of Veterinary Medicine was fortunate to recruit Dr. Tennant and his family to the Ithaca campus in 1972, where he was a faculty member for more than 42 years. During this time, he was a beloved teacher, a highly respected large animal internist, and a world-class comparative medical researcher. At Cornell, he was recognized as an international expert on hepatic and intestinal diseases of horses, cattle and sheep. In 1973, Bud was named a charter member of the American College of Veterinary Internal Medicine. In 1999, he received the most prestigious award that this college offers, the Robert W. Kirk Award for Personal Excellence. Dr. Tennant was the first large animal internist to receive this award.

Dr. Tennant’s research during his years at Cornell focused on comparative intestinal and hepatic disorders. His laboratory at Cornell was responsible for the identification of the woodchuck hepatitis virus (woodchucks are also known as groundhogs, Marmota monax) and for the development and decades-long operation of a woodchuck breeding colony. The humble woodchuck proved early-on to be a near perfect animal model for viral hepatitis research and Bud’s program provided woodchucks to hepatic researchers world-wide. During this time, he became one of the best funded researchers on the Ithaca campus, receiving uninterrupted support from the National Institute of Health and National Institute of Infectious Diseases from 5/27/1985-9/29/2010. The research performed in his laboratory lead to numerous discoveries related to the pathogenesis, diagnostic testing and potential treatments for human viral hepatitis. At Dr. Tennant’s memorial service in 2017, Dr. Timothy Block, co-founder of the Hepatitis B Foundation and the Baruch S. Blumberg Institute, noted that almost every drug currently available for the treatment of hepatitis B was developed in Bud’s woodchuck model. His research and woodchuck colony continue today at Roswell Park Cancer Institute in Buffalo, New York.

Bud was considered by many to be the quintessential faculty member. He was a worldclass scholar and a highly productive researcher who authored or co-authored over 200 scientific publications, numerous textbook chapters and many invited publications. He also served as editorial reviewer for Nature Medicine, Hepatology, Journal of Virology, Proceedings of the National Academy of Sciences, and the Journal of the American
Veterinary Medical Association. Bud served on a great many campus-wide committees at Cornell and represented Cornell on numerous state, national, and international committees on science and education. In 2002, the New York State Veterinary Medical Society acknowledged Dr. Tennant for his outstanding veterinary service to New York State. Bud took very seriously his responsibilities to colleagues and to the College of Veterinary Medicine. He always attended seminars given by candidates interviewing for faculty positions; he believed that helping select new faculty members was one of his most important duties. His attendance at the veterinary college faculty meetings approached 100% and, in those meetings, he was famous for listening carefully to all sides of any discussion, commenting when needed, but always upholding strict academic standards and integrity, even when doing so was the hard choice.

For many years, Bud knew almost everyone in the veterinary school. He supported everyone around him in any way possible through re-appointments, promotions, and whatever other challenges life presented. Dr. Tennant was extremely faithful to Cornell University, often crediting this to his father who taught him the importance of being faithful to a good employer. Bud is a much-missed mentor for everyone who worked with him at Cornell, including his technical staff, students, veterinarians, Ph.D.s and MDs; he was particularly well-known throughout his entire career as a very strong advocate for and trusted mentor to faculty women. A bronzed plaque with his photograph can be found at a main entrance to the veterinary college and reads; “A friend to all and mentor to many”. This plaque reminds those of us fortunate enough to have known Bud of his kindness, great sense of humor and enthusiasm for science and life-long learning.

In the fall of 2013, upon retirement from the College of Veterinary Medicine, Dr. Tennant was awarded Emeritus Professor status. However, as might be anticipated, Bud maintained his lab and continued working. He just didn’t get paid any more! As retirement neared, Bud returned to equine medical research where his research team discovered the cause of serum hepatitis in horses; a disease known as Theiler’s disease that was first reported in South Africa in 1909. The etiology of Theiler’s disease remained unknown for more than 100 years until the team’s discovery of an equine parvovirus, which is named after Dr. Tennant: Equine Parvovirus Hepatitis strain BCT1. Bud was delighted both professionally and personally to participate in the discovery of this virus, feeling that his career, which had started more than 50 years prior working with horses, had come full circle.

Dr. Tennant was not only a highly successful clinician, teacher, mentor, faculty member and researcher; he was also a truly classic gentleman and, above all else, was a man of the highest integrity. In spite of his many professional responsibilities, he always made time to chat with colleagues, students and co-workers. He loved informal hallway communications about family, friends, sports, medicine, music, and the arts and was passionate about all of them. He had many stories to tell and one of his favorites seemed to be about his experiences fishing in Alaska with his brother Robert. His friendly hallway chats were so frequent and obviously enjoyable to him that many were amazed how he was able to accomplish as much as he did. He always had time for yet another story, anecdote or conversation.

Bud’s greatest loves, though, were his wife, children and grandchildren. Bud is survived by his beloved wife of 53 years, Priscilla. He frequently spoke of the wonderful life he had
being a husband to Priscilla and a father to his son, Christopher, and his two daughters, Priscilla Anne and Carolyn. He truly enjoyed being a husband and father and shared many wonderful stories about their family experiences and adventures. In later years, he and Priscilla frequently visited their grandchildren to spend time watching and encouraging each one as they participated in sports, art and music. We suspect there were lots of stories from Granddad also mixed in!

Bud C. Tennant was a man of very tall stature and a man with an equally tall list of accomplishments. His loving heart, warmth, humor and compassion, along with his impeccable attire (which always included a bow tie and a coat) will be sorely missed. Bud was the archetypal “gentleman and a scholar”, and will always remain so in the hearts and minds of those with whom he worked and loved.

Written by Thomas J. Divers and Charles A. Hjerpe

Editor’s Note: Professor Tennant passed away in 2016. Unfortunately, a memorial statement was not prepared at the time, so we’ve included his tribute in this issue.
Former Cornell Law School Dean Gray Thoron died peacefully in his sleep at Kendal of Ithaca on Sept. 18th 2015 at the age of 99. He had remained his entire life a proper Bostonian, almost always dressed with jacket and bow tie. Born in Danvers, MA, on July 14, 1916, his childhood was spent in a house there marked with a bullet hole dating back to the Revolutionary War. Educated at private schools in Cambridge, MA, and Concord, NH, he entered Harvard College and then Harvard Law School. Upon graduation he joined the Wall Street firm of Sullivan and Cromwell in New York City just a few months before Pearl Harbor was bombed. He joined the Army the next day.

During the war he was a combat infantryman with armored brigade in Europe where he eventually became a company commander with the rank of Captain. He was seriously wounded in the assault on the Siegfried Line and earned a purple heart with cluster and was awarded both a Bronze and Silver Star for his efforts. At the war’s end he rejoined Sullivan and Cromwell as a litigator but found that role increasingly difficult due to a serious hearing loss attributable to his war wounds. It was then he decided upon a teaching career that began at the law school of University of Texas in 1948. While there he was active in politics and was a member of the team that successfully persuaded the national Republican authorities to seat the Eisenhower rather than Taft delegation at the convention about to choose their party candidate for the upcoming 1952 presidential election. He was asked to join the Office of the Solicitor General in 1954 where he argued a number of cases in behalf of the government in front of the Supreme Court of United States. It was from there that in 1956 he was invited to become dean of The Cornell Law School.
It becomes increasingly difficult to appreciate how different were those days a half century ago. Faculty wore jackets and ties. There were no desk top computers, much less handheld devices that served as telephones, message stations and information booths. A wrist watch that also served as telephone and mini-computer connected to the vast outside world was grist for Dick Tracy comic strips and Flash Gordon serial movie shorts at the local cinema. A good all round grade point average was a C+, and an A unheard of in polite society. And Gray came to Ithaca to the lead a very contented country club like institution quite pleased to think of itself as the best New York law school. It was he who shook up the place and left it rapidly turning into one bent upon becoming truly a national law school.

Under his leadership the school launched a search for new faculty who shared his dream, particularly persons who demonstrated teaching ability and an interest in research and writing on topics of national significance. It must be noted that Gray’s vision of the law was not confined to serving the needs of Beacon Hill style elites but included the less fortunate members of the community. To this end he set about founding what has become a magnificent legal aid clinic at Cornell, an institution that provides not only legal help to those who cannot afford it otherwise but produces graduates of the school trained to service the needs of such persons.

Throughout his academic career Gray preached the need never to rest content with just knowing the rules of law, but how to conduct oneself in a court room in order to put those rules to work servicing the actual needs of real live clients. Indeed, his teaching ranged from dealing with such a basic problem as how to find clients to the absolute necessity always to conduct oneself according to ethical norms. In this regard Gray was a national leader in perceiving the needs to teach aspiring lawyers their professional responsibilities, this before ethics became a required course in all law schools.

Gray gave up his deanship in 1963 and continued to teach at the law school until his retirement in 1987. Throughout his entire career at Cornell he was always more than willing to talk things over with students, particularly those worried about what choice they should consider as realistic given their grade point average. And in this regard, he was a superb talent scout, able to see in a not-so-hot scholar the makings of an excellent practitioner. Almost without fail, that poet no else on the faculty would recommend would indeed turn out to be a crackerjack lawyer in disguise.

Gray also oversaw a piece of major construction at Myron Taylor Hall as a new residential wing was attached. This was known as Hughes Hall, named after Charles Evans Hughes, one time professor at the law school but better known for his career on the Supreme Court. Herein were housed each first year class wherein
they could support one another in an often difficult adjustment to the pressure of law school. As chance would have it, the class living there in the year Gray died would be the last one to do so, the building to be converted to office space for faculty and administrative purposes.

Gray married Mary Dwight Clark in 1939, with whom he raised five children. They were divorced in 1968. In 1971 he married Patty Porter Holmes, who predeceased him in 2000. Though out his career at Cornell, including his emeritus years, his home was the scene of remarkable parties featuring a mix of junior faculty and old timers, as well as members of the wider community. And there always was Gray in his jacket and tie doing his best to make sure everyone was put at ease and encouraged to enjoy themselves. To recall Gray Thoron is not unlike inventing the universal solvent and finding the subject has no boundaries. So let me conclude these remarks with the thought that Gray was a man, taken for all and all, the likes of which I shall not look upon again.

Ernie Roberts
Professor James Shelby Thorp passed away on May 2, 2018 in Blacksburg, Virginia. He was predeceased by his son, Jeffrey Thorp, and is survived by his wife Jane Thorp, his daughter Betsy VanAlstyne, his son Gregory Thorp, stepdaughter Erica Shoemaker, and grandchildren, Alex Bruce, Kelsey Bruce and Emma Lamoureux.

He was born on February 7, 1937 in Kansas City, Missouri son of Joseph Chester and Ruth Vefe (McNamara) Thorp. After graduating from Kansas City Central High School in 1954, he entered Cornell University where he earned a Bachelor of Electrical Engineering degree in 1959, a Master of Science degree in 1961, and a Ph.D. degree in 1962.

Post graduation he remained at Cornell as an Assistant Professor in the School of Electrical Engineering (1962-1966), Associate Professor, (1966-1975), and Professor (1975-2004). He retired from Cornell in 2004 and was subsequently awarded Emeritus Professor status by the Board of Trustees. As of 2004 he had been at Cornell for 50 years, eight years as a student and forty-two years as a faculty member. During his tenure as a faculty member he served as the School’s Associate Director (1991-1994), and the Director and Charles N. Mellowes Professor of Engineering (1994-2004). He was a Faculty intern American Electric Power (AEP) Service Corporation, New York City, 1976-1977 and served as a consultant to AEP from 1977 until 1983. During his career he wrote more than 200 technical publications, co-authored two books, and holds two U.S. patents.

Upon retirement in 2004 he accepted an appointment as the Hugh P. and Ethel C. Kelley Professor of Electrical and Computer Engineering as well as the Department Head of the Bradley Department of Electrical and Computer Engineering at Virginia Polytechnic and State University, Blacksburg, Virginia. He remained the head of the department until the summer of 2009 when he again retired and was awarded the “Hugh P. and Ethel C. Kelly Professor Emeritus” title by the Virginia Tech Board of Visitors. He continued to be technically active after retirement until his death in 2018.

He was made a Fellow at Churchill College, University Cambridge in 1988, elected a
Fellow of the Institute of Electrical and Electronics Engineers in 1989, elected to the National Academy of Engineering in 1996 “For contributions to the development of digital techniques for power system protection, monitoring, and control”. He received an IEEE Power Engineering Society Career Service Award in 2001 and the Outstanding Power Engineering Educator Award in 2006.

He was co-recipient of the Benjamin Franklin medal in Electrical Engineering, awarded by the Franklin Institute in 2008 for “… contributions to the power industry, particularly microprocessor controllers in electric power systems that have significantly decreased the occurrence and duration of power blackouts”. Jim’s co-recipient, Arun Phadke, said of his collaboration with Jim, “In all our work together I could always count on him to provide strong analytical foundation to the work we did. Together, we wrote numerous papers and books, travelled to many countries on work related matters, and I believe we took delight in each other’s companionship. He was a master raconteur and his colorful stories were always a joy to the listener. I will miss him.”

Jim’s technical achievements are many. It was also his work in and out of the classroom, with graduate and undergraduate students, that was especially laudable. He understood very complex ideas so clearly and was always eager to share his understanding and enthusiasm with others. In addition, he loved the game of golf and was not just an exceptional golfer but he was a “student of the game”.

In his later years, he had to give up the game he loved for health reasons. He then decided to focus on his love of art. As a result he became an outstanding artist. His favorite artist was Jackson Pollock. Jim subsequently created several original pieces in that genre. He also loved woodworking, and the opera. For all of his life he had the habit of spending Saturday mornings doing his research while listening to the opera. And he loved to tell stories of his own creation. His favorite stories were usually about golf or something that happened to him during one of his travels.

Jim was a cherished father and grandfather, a revered educator, a gifted artist, an avid golfer, woodworker, world traveler and an accomplished teller of stories. He has been missed.

Written by Robert J. Thomas and Terrance L. Fine
The Section of Plant Pathology and Plant-Microbe Biology in the School of Integrative Plant Sciences (formerly Department of Plant Pathology and Plant-Microbe Biology), and the Office of International Programs in the College of Agriculture & Life Sciences lost a dear friend and visionary colleague with the passing of H. David Thurston at the age of 87 on September 26, 2014 after a short illness in Ithaca.

H. David Thurston was born in Sioux Falls, SD, on March 24, 1927. He received his primary and secondary education in Sioux Falls and spent 16 months in the Air Force prior to entering the University of Minnesota. In 1950, he received a B.S. degree, majoring in plant pathology and minoring in bacteriology, and M.S. and Ph.D. degrees in plant pathology in 1953 and 1958, respectively. H. David married his lifelong partner, Betty Hillers, in 1951, and together they had three sons – Jeffrey, Joseph, and David.

While working toward his Ph.D. degree, Dave spent two years with the Rockefeller Foundation in Colombia, and in 1958, upon completion of his doctorate, he joined the Rockefeller Foundation in Colombia as the director of their Plant Pathology program at the Instituto Colombiano Agropecuario. While in Colombia, he was promoted to the director of the Rockefeller Potato Program in Bogotá in 1963, and in 1965, to director of Plant Sciences of the Colombian Agricultural Institute. He and his family stayed in Bogotá until 1967. Throughout his 11 year career in Colombia, Dr. Thurston was known for his calm insistence on accuracy and thoroughness. Though his colleagues often referred humorously to his obsession with neatness, this trait was respected and soon became a trademark of a student or research assistant fortunate enough to come under his direction. These traits, and the ever present ‘cards in his wallet’, followed him to Ithaca and were a mainstay during his 29 year career at Cornell.

In 1967, H. David joined the college of Agriculture at Cornell University as the International Professor of Plant Pathology, one of the original ten International Professorships established in the College of Agriculture at Cornell by Governor Nelson Rockefeller. David Thurston is most recognized as a dedicated contributor to and supporter of international plant pathology, which
marked his career for many decades. Dr. Thurston showed exceptional leadership in training graduate students to deal with plant disease problems of the tropics and developing countries. He influenced generations of U.S. students to pursue careers in international agriculture, and prepared generations of international students for leadership positions in their respective national programs. He guided 22 students through their advanced degrees in plant pathology and served on the committees of dozens more. Dr. Thurston and his associates published extensively on the diseases of rice, oats, sugarcane, bananas, and other tropical crops, but it was his piercing insight into the phytopathological problems confronting the potato grower that brought him international fame. Though an expert in research on fungicides and their application, he pioneered the discovery of new sources of resistance to such classic diseases as late blight (*Phytophthora infestans*) and brown rot (*Pseudomonas solanacearum*). For over twenty years at Cornell, Thurston worked closely with the potato breeders in the Department of Plant Breeding on testing breeding material for resistance to *Phytophthora infestans*, *Alternaria solani*, *Verticillium* spp., *Streptomyces scabies*, potato leaf roll virus, virus X, and virus Y. In addition, breeding material were maintained in tissue culture and tested (using ELISA) for freedom for potato viruses X, Y, A, S, M, and PLRV. Material was tested for freedom from potato spindle tuber viroid using a nucleic acid hybridization (cDNA) test.

Dr. Thurston taught or participated in courses in tropical plant pathology, traditional agriculture, agriculture in the tropics, and other international agriculture courses. From 1969-1997 Dr. Thurston taught International Agriculture 602 (Agriculture in the Developing Nations, which included a 2 week field trip to the American tropics). He was one of the founders of this course, which has now operated for 48 years as perhaps the most life-changing and popular course in the college. He remained active in teaching and writing after his retirement from Cornell University in 1995. Even at 79 years of age, Thurston, as an emeritus professor, could fill a 40-person classroom to its capacity in a course he originated on Traditional Agriculture.

Dr. Thurston’s abilities as a teacher, director, and organizer of research, and his knowledge of plant pathology at the international level, made him a widely sought consultant and speaker in the areas of crop protection, concepts of resistance, and international agricultural development. He traveled extensively in Latin America, Asia, and Africa for Cornell and while consulting for CGIAR, FAO, and US/AID.

Dr. Thurston raised awareness of policy makers and the public with regard to issues of world hunger and sustainable agriculture, and his legacy of books and photos will serve as key resources for future generations of U.S. and international plant pathologists. His first book, *Tropical Plant Diseases*, was published with APS Press. More recently, his major interest was compiling and analyzing information on sustainable plant disease management practices of traditional farmers, most of which are cultural practices. He published two additional books on these subjects: *Sustainable Practices for Plant Disease Management in Traditional Farming Systems* and *Slash/Mulch Systems: Sustainable Methods for Tropical Agriculture*.

In 1972 Dave Thurston was selected as a Fellow of The American Phytopathology Society (APS) and later received the APS International Service Award. He was recognized for his contribution to student education with the ‘H. David Thurston Student Travel Award’ named in his honor.
As an active member of Trinity Lutheran Church, H. David was an ardent advocate of mission work, and through the church actively assisted in the resettlement of refugees from Vietnam, Myanmar (Burma), Russia and other countries.

H. David is survived by his wife Betty, sons Jeffrey (Ourania Chilimidos) of Oakland, CA, Joseph (Janet Durkin) of St. Paul, MN, and David (Emily) of Ithaca, NY; grandchildren Alexander and George Thurston, Nickolas and Kristofer Chilimidos Thurston, and Aaron Thurston; Brother John Thurston (Corpus Christi, Texas) and many nieces and nephews. He was pre-deceased by his brother Charles and sister Virginia.

Thomas A Zitter, chair; W. Ronnie Coffman, Gary C. Bergstrom
William P. Thurston

October 30, 1946 – August 21, 2012

William Thurston died in Rochester on August 21, 2012 at the age of 65. He had a completely original approach to mathematical thinking (and life in general): he kept in his office and at home an extensive collection of toys and games that could be given mathematical meaning; he always thought that mathematics should be a playful activity.

He had 33 graduate students and 174 mathematical descendants but more generally he taught a generation of topologists, group theorists and complex analysts how to incorporate geometry in their thinking.

Bill was a member of the charter class of New College in Florida where he also met his first wife, Rachel Findley. He graduated in 1967 and received his doctorate from Berkeley in 1972. In Berkeley, Bill and Rachel started a family and Bill began working on foliations. He spent a year at the Institute for Advanced Study, then another year at MIT as an Assistant Professor. In 1974, he was hired at Princeton University as a 28 year old full professor. It was at Princeton that he began wondering about the question of geometric structures on three dimensional manifolds.

While at Princeton he taught a legendary course which became the basis for his book, *Three Dimensional Geometry and Topology*, which won the AMS Book Prize in 2005. Bill had strong feelings about exposition. Bill said about this book: “I had the ambition to try to communicate on a more conceptual level, paying attention not only to the logical aspects of what is correct but also to the psychological aspects of how we can hold it in our heads and understand it. The geometric modules of our brains are the parts most severely neglected in most mathematical writing.”

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In 1982 he was awarded the Fields Medal for his work on three dimensional manifolds. In 1991, he returned to UC Berkeley as Professor of Mathematics and in 1993 became Director of the Mathematical Sciences Research Institute. In 1996, he moved to University of California, Davis. In 2003, he became Professor of Mathematics at Cornell University.

Bill did revolutionary work in foliation theory, low-dimensional topology, dynamics and geometric group theory.

His early work, in the early 1970’s, focused on foliations. His work contained striking examples that seemed to contradict prevailing thinking and enormously intricate and clever constructions which displayed the essential unity of the field. He solved so many problems that graduate students were discouraged from going into the field by their advisors since it appeared that after Bill was done there would be no problems left to work on. Bill was awarded the Oswald Veblen Prize for his work on foliations. Only now is the field catching up with his contributions.

In the late 70’s and early 80’s, Bill proved a collection of results which electrified the mathematical community. These results may appear to be unrelated but in fact share a connecting thread. The starting point for all these results is the question: what is the right geometry underlying this problem? The results were the following:

- Homeomorphisms of surfaces built from simple models: finite order maps and pseudo-Anosov maps.
- A compact 3-manifold that fibers over the circle has a hyperbolic structure if and only if its monodromy is pseudo-Anosov.
- A compact Haken 3-manifold admits a hyperbolic structure if and only if it contains no incompressible tori.
A post-critically finite branched map of the 2-sphere to itself is equivalent to a rational function if and only if it admits no "Thurston obstructions."

The second and third results show that fairly general constructions of 3-dimensional manifolds produce hyperbolic manifolds. This inspired Thurston to make the geometrization conjecture: every compact 3-manifold is built from pieces each of which has one of eight natural geometries. This geometric formulation of the problem was very influential. This conjecture was solved by Perelman in 2005.

Bill described his introduction to the question as follows: "When I gradually realized the geometric beauty of 3-manifolds, it was as if it was a giant whirlwind, far bigger and far stronger than I, had swept me up and taken over my mathematical life. I couldn’t escape (admittedly, I didn’t even want to escape). At first I glimpsed only parts of the big picture, but little by little it came into focus and the mist blew away. I worked very hard and was able to prove the geometrization conjecture in many important cases, including, in some sense, almost all cases. I became completely convinced that the geometrization conjecture is true, but my approaches were extremely difficult, if not impossible, to push through."2

Al Marden created the Geometry Center at the University of Minnesota as a place where Thurston’s ideas could be translated into concrete form. Many great things came out of the Geometry Center, in particular the two videos, Not Knot and Inside Out that give Bill’s clever new construction for turning the sphere inside out.

The famous Japanese couturier Issey Miyake and his clothes designer Dai Fujiwara, designed their 2010 collection after Thurston’s “eight geometries.” Bill was invited to the presentation of the collection at Fashion Week in Paris. Bill really got into the swing of things: the set was suggestive of the fundamental domain for a Kleinian group, and Bill wandered around it winding giant ropes around Dai and himself, all while speaking of how this reflected various aspects of the geometry of knots. The press corps was mystified but much entertained, and had a field day.

Theorems one and four on the above list deal with the iteration of maps which is referred to as dynamics. Bill’s technique for finding the correct geometry in the problems listed above had a common feature. He would create the geometry by some infinite process, starting with some initial geometry and applying a transformation over and over, until the initial geometry converged to the desired geometry. All of Bill’s thinking was influenced by dynamical
systems that are somehow the essence of “infinite processes.” So in some sense all of these results concerned dynamical systems.

Around 1980, Bill broadened his focus from groups that arise in specific geometric problems to groups in general. Bill stressed the notion that a group is a very geometric object. The book *Word Processing in Groups* was a massive attempt to write in one place the many insights that Bill brought to the subject. It took the combined efforts of Epstein, Paterson, Cannon, Holt, Levy and Thurston.

In addition to the Fields medal and Veblen prize, Thurston won the Alan T. Waterman award from the NSF and the Steele Prize of the American Mathematical Society for seminal contributions to research but, more important than the awards that Bill received, he had a profound influence on all of the mathematical fields in which he worked and on all the people that knew him.

Bill is survived by his wife, Julian Muriel Thurston; their children Jade and Liam; three children from his first marriage, Nathaniel, Dylan and Emily; his mother, Margaret; a sister, Jean Baker; a brother, George; and two grandchildren, Orion and Briet.

1 Notices of the AMS, vol. 52, no. 4, April, 2005, p. 450
2 Notices of the AMS, April 2012, vol. 59, no. 4, p. 565

*John Smillie, Chairperson; John Hubbard, Allen Hatcher*
Professor Ari van Tienhoven was born in The Hague, Netherlands. During his college years, which coincided with World War II, he was part of the student resistance movement in the Netherlands. This ultimately led to him being hidden in the home of a Frisian farmer. He developed enormous gratitude and love for this family for the sacrifice and risk they took on his behalf. True to Ari’s loyal nature, he maintained a lifelong friendship with them and their extended family.

While a student in Wageningen, his knowledge of Dutch, German, French and English enabled him to volunteer as a guide for visitors. As a result, he was invited to visit the University of Illinois and eventually, he left the Netherlands and came to the United States in 1947 to begin a graduate program at the University of Illinois. His beloved Ans joined him in Illinois sometime after and they were married in March, 1950. Under the guidance of Dr. Andrew Nalbandov, he began his research career focusing on poultry physiology and completed his Ph.D. in 1953. He spent two years as an Assistant Professor at Mississippi State College and then joined the faculty in the Department of Poultry Science at Cornell in 1955. He enjoyed teaching and was well liked by students.

“Dr. van” (as his students called him) believed that his most important contribution was through his teaching. For many years he taught Reproductive Physiology of Vertebrates. He stated that “teaching was the real joy of my professional life….some of the reasons for this love are that I have an evangelistic (but agnostic!) tendency but also that I love the subject matter, which is easy
because it deals with sex!” He also taught courses in avian physiology and animal reproduction. His teaching was recognized with the Edgerton Career Teaching Award (selected by his peers) as well as the Professor of Merit Award (selected by students).

Dr. van incorporated unconventional teaching methods and evaluation strategies before it was fashionable. While his oral exams struck terror in many students, he believed it was a useful technique for evaluating students. He was the quintessential professor—always asking questions and setting high standards for class work and research. He was outspoken on matters of student concern and many students came to him for advice. He was never too busy to help students and colleagues solve their problems. When faculty members rejoiced in the quiet of summer in Ithaca, they were quickly reminded by Ari that the students made it all possible. He retired promptly at the age of 65 but retirement really only meant that he was no longer on the payroll. After retirement, he initiated 2 new courses; he developed a very timely course on AIDS and Society and subsequently, an additional course on Ethics and Animal Science, which continues to the present.

Ari generally had a hands-off approach to graduate student training. His graduate students had enormous freedom. He always challenged them although his basic requirement was to work hard and not manipulate data. As long as this was done, one had his complete support and loyalty.

Ari was very good at designing physiological experiments that could confirm or deny proposed mechanisms for reproductive phenomena. He helped explore the possible reasons for why birds are the only vertebrate group that does not have any live-bearing species. He also published on several areas in poultry physiology including ovulation, thermoregulation and animal welfare. He published the first stereotaxic atlas of the brain of a bird and his studies of the thyroid effect on reproduction were landmarks in the field. He was made a Fellow in the Poultry Science Association as well as a Fellow in American Association for the Advancement of Science. His desire to learn as much as possible about chicken physiology and anatomy found him attending a wide range of talks on campus. Part of one sabbatical leave was spent as a visiting professor in the Department of Anatomy at the Veterinary College where he was able to increase the teaching time devoted to bird anatomy. His ability to read the literature in several languages was a great help to many colleagues and led to his being chosen by Professor Asdell to revise his book on mammalian reproduction. In addition to this book, he also published two editions of a reproductive physiology textbook.
At Cornell, he thought of himself as a very good “politician” in that he was often successful in getting things done. He loved the freedom at Cornell and the history of cross-college interactions. He believed that anything was possible at Cornell and often commented that when he asked a colleague for help, he always received it. His loyalty to people and causes he supported was unwavering. He was a man of principle in all of his dealings and made his intentions clear. He was well known and appreciated for the many tough years that he served on the Ithaca School Board. At the conclusion of his term as President, the School Board praised Ari’s “complete, eminently fair treatment of all issues to come before this Board.” In 2001, Ari received the Tompkins Community Action award to acknowledge his contributions “given unselfishly over the past 35 years.”

In his last lecture, Ari defined himself as somewhat of an “idealistic pragmatist, not a philosopher or a contemplator, but a politician in the best sense of the word, who defines politics as the art of the possible.” Ari made many things possible. His many anonymous gifts—to the parent struggling to pay a school fee or the custodian determined to complete a degree—were spontaneous and had a direct impact on the recipient. Often his donations honored others, including former students, public figures, mentors, and colleagues. Ari established awards and endowments in Mann Library to honor his wife, individual staff members, and student and staff employees of the library.

Soon after Ari officially retired in 1987, he remarked to a friend, “Cornell can do quite well without me, but I really cannot do without Cornell.” Ari never left Cornell. In addition to his office in Morrison Hall, he established himself in Mann Library, a place he considered his home away from home. Every morning in the Library, he read his daily Dutch newspapers online, scanned a broad range of science journals on the shelves, and sent copies of articles to friends or colleagues that he thought would interest them. Ari wrote that “Cornell has been unbelievably good to me and the words Freedom with Responsibility have not been a slogan but have been and are a credo.”

In the final lecture of his Reproductive Physiology class, Human Reproduction and Society: a two way street. A Sermon, Ari spoke as both an animal physiologist and a citizen. He considered the relationship between human reproduction and society. Ari was struck by the unique qualities of the Declaration of Independence, noting that he knew of “no Declaration or Constitution that includes such a statement about the right to the pursuit of happiness.” He challenged his students to be thoughtful citizens:
“My career and much of my life is nearly over and it is to you, ‘my’ students that I have to look at the future which I may partly see and partly have to take on trust. I hope that my course and this sermon have given you the impetus to do your own thinking but at the same time that they have given you the idea that there are other solutions and other beliefs to be respected. If you can remember that during your next 50-60 years then I have fulfilled my task.”

Ari was devoted to Ans, his wife, friend and help-mate; she predeceased him in 2005. He was proud of his three children, Richard, Arianne, Andrew and their families, who survive him.

Patricia A. Johnson, Chair; Howard Evans; Janet McCue
Leonard D. Topoleski, professor emeritus of vegetable crops and horticulture, died February 8, 2019, at Guthrie Robert Packer Hospital in Sayre, Pennsylvania. He was 83.

Born in Ashley, Pennsylvania, he graduated from Ashley High School in 1953, where he played on the football team for three years and participated in the debate team and theater group. After earning B.S. (1957) and M.S. (1959) degrees from Penn State University, Len went on to earn his Ph.D. in plant breeding and genetics from Purdue University in 1962. That same year, he joined Cornell’s faculty in the then-Department of Vegetable Crops where he worked until his retirement as professor emeritus in 2001.

Professor Topoleski conducted research on vegetable crops, served as an extension educator and left a legacy as a popular teacher and student adviser. “He was an enthusiastic teacher of our undergraduate beginning horticulture course and, over his career, inspired many students with his love of plants,” said Chris Wien, M.S. ’67, Ph.D. ’71, professor emeritus of Horticulture.

Professor Topoleski’s research involved understanding incompatibility issues that arise when breeding different tomato species. He received training in the use of electron microscopy and became the department expert on using the technique for plant science research. He also researched greenhouse vegetable production, evaluating new growing systems and fertility management, assessing new varieties, and providing basic greenhouse tomato production information to new growers.

“Len’s Ph.D. research in 1962 focused on grafted tomatoes and eggplants,” said Steve Reiners, chair of Cornell’s Horticulture
“He was really way ahead of its time as this research area has really taken off the last few years.”

Although an active researcher, his biggest impact may have been as a teacher. “Professor Topoleski was revered by his students for his hands-on and engaging approach,” said Frank Rossi, professor and extension turfgrass specialist in the School of Integrative Plant Science. “Students would be responsible for growing and studying the growth of plants from seed to harvest each semester, a tradition I know my colleagues and I have attempted to maintain in our coursework today.”

Professor Topoleski’s general horticulture course (Hort 102) exposed hundreds of Cornell undergraduates to the world of fruits, vegetables, and landscape plants for the first time. His vegetable class was very popular, getting a whole new generation excited about horticulture. His teaching style focused on building horticultural skills and youth development through learning-by-doing. He also was an undergraduate adviser for as many as 30 students per year.

Michael Buthe, a class of 1983 Plant Science major valued his relationship with Professor Topoleski. “He was my student advisor during my undergraduate years at Cornell from 1979 to 1983. He was always very supportive of my desire to explore a diverse variety of coursework while ensuring I was on target to meet my requirements as a Plant Science major. He had a wonderful, calm demeanor, despite his deep voice and burly physique. I greatly appreciated his sound advice and always looked forward to our periodic meetings. He was also very passionate about his research, particularly his focus on tomatoes. He will forever be an important part of my fond memories of Cornell.”

Professor Topoleski also had an active extension program. Serving as the 4-H vegetable crops extension specialist, he trained agents, wrote highly regarded extension publications and guides, and developed new programs. “He was well-known and appreciated by 4-H and home gardeners all over the state,” said Elmer Ewing, professor emeritus of Horticulture. Len’s subject matter resources were the foundation of numerous county and state-wide horticultural programs.

Joann Gruttadaurio, retired senior extension associate in Horticulture remembered Professor Topoleski as one of a team of Extension faculty who set as a priority the education and development of students, youth, teens, and 4-H leaders. “He, along with Ernie Schaufler traveled the state to bring the latest and best resources to hundreds of Extension field staff, volunteers, youth, and the public”, said Gruttadaurio. She added, “Many of us who chose extension education as a career still look fondly on Len as one of our favorite mentors.”
Professor Topoleski had a passion for gardening, collecting antiques, photography, and every aspect of Cornell Athletics. He was a longtime communicant of St. Catherine of Siena Church, Ithaca.

He is survived by his loving wife of nearly 61 years, Janice; children Professor L.D. Timmie-Topoleski (Marci Chasnow, M.D.), Tamara Ann Topoleski, M.D. (Leonard Foffa), and Daniel T. Topoleski; grandchildren Mackenzie (Collin), Eliza, Fraser, Audrey and Delaini; sister Dorothy Johnson; and several nieces and nephews. For those who would like to honor Len in a special way, please consider a contribution to The LAST Foundation Inc., 1266 Shelter Rock Rd., Orlando, Florida 32835. This foundation, a 501(c)(3) organization, was formed in memory of his daughter-in-law, Lisa Ann, and helps local families with medical expenses associated with illness.

Written by Steve Reiners
Ken received degrees of B.S., M.S. and Ph.D. (1966) in Mechanical Engineering from the University of Minnesota. He then became a Research Associate (1966-68) at the Fire Research Section of the National Bureau of Standards in Gaithersberg, MD, where he studied how fires develop in buildings.

In 1968, Ken came to Cornell as Assistant Professor of Thermal (Mechanical) Engineering. For a sabbatic year, he was a Postdoctoral fellow at NCAR (National Center for Atmospheric Research). In due course, he became Professor of Mechanical Engineering in the School of Mechanical and Aerospace Engineering, and, after 2001, occupied the chair of Joseph C. Ford Professor of Engineering.

At the time of his death, Ken Torrance had been a member of the Cornell Faculty for 42 years. Along the way, he served the University, College of Engineering, and his Department in a wide range of capacities, notably three years as Associate Dean of Engineering for Research and Graduate Affairs.

In his professional career, Dr. Ken Torrance was a master of the science of heat and energy transformation, and its application to a wide range of practical applications. He was a leader in theory, computation, and experiment. His research was always done with students, and credit for results was generously shared with them. Having supervised 46 MS/Ph.D. theses and 28 undergrad engineering projects at Cornell, Dr. Torrance trained generations of engineering scientists to deal effectively with the great energy issues of the future,
not just in Mechanical Engineering, but in the fields of Aeronautics, Geology, Architecture, Computer Science, Agricultural and Biological Engineering, for whom he co-supervised student theses. Dr. Torrance and his students published important fundamental contributions to the knowledge of heat convection in planetary mantles, for example in geothermal processes. They also studied heat exchange processes in the Earth’s atmosphere, especially in and around cities. In his laboratory, Dr. Torrance was the first to determine the thermodynamic structure of boiling convection in porous materials. His research provided understanding of how fire spreads on the surface of liquid fuels. He also performed important studies of methods for component cooling of miniaturized electronics, and pioneered numerical methods for various heat transfer computations.

Perhaps his most notable accomplishment was to show that to be successful, “computer graphics”, or computer generation of realistic synthetic visual images of objects and scenes, must fully account for the radiometric properties of the objects and media involved. Collaborating with faculty and students in the Cornell Program of Computer Graphics, he went on to develop a measurement laboratory in which such properties are determined, and he pioneered the development of physical models and computational methods by which the goals of computer graphics are then achieved, even for enclosures with multiple reflections. He introduced radiosity algorithms now recognized as breakthroughs for computer graphics. Much of the software now used for realistic simulations in flight simulation, computer games, architectural rendering, the entertainment industry, automobile design, and cosmetic products, is based on Ken’s theoretical and experimental work. He also extended his radiation energy-transfer ideas to problems of food inspection and microwave heating.

The great impact of Ken’s experimental talent and computational leadership in the computer-graphics field were recognized when he was given the prestigious SIGGRAPH Computer Graphics Achievement Award of the Association of Computer Machinery (ACM).
Dr. Torrance’s 7 conference keynote speeches, on Boiling in Porous Media, Mantle Convection, and Image Synthesis, are all evidence of his wide scientific influence. He was elected Fellow of the American Society of Mechanical Engineers, and served on important committees for the ASME Heat Transfer Division. He received three “best paper” awards from the ASME. He was also a Fellow of the American Association for the Advancement of Science.

Owing to Ken Torrance’s personal and scientific reputation at Cornell, and his generous spirit of helpfulness, he was in great demand for committee service, far beyond what is usually expected of a university professor. For the University at large, he was a member of the General Committee of the Graduate School, the Executive Committee of the Materials Science Center, and the Faculty Council of Representatives (as Chair of its Research Policies Committee). He also served for a time as an Advisor for CURW (Cornell United Religious Work).

For the College of Engineering, in addition to his service as Associate Dean, Ken served on the College Policy Committee, the College Computing Policy Committee, the Facilities and Master Plan Committee, Lecture Halls Renovation Committee, and the Duffield Hall Safety Evaluation Committee (especially concerned with the design of laboratory exhaust stacks). For the Mechanical and Aerospace School, Ken most notably served as Graduate Faculty Representative for the Field of Mechanical Engineering, as Chair of the Graduate Area of Fluid and Thermal Sciences, and as Faculty Advisor to the Student Section of ASME.

Students and colleagues of Ken Torrance testify to the benefits they derived from their associations with him. In all his studies, Ken pursued and gained understanding by very hard work, and then happily conveyed that understanding to colleagues and students; his three teaching awards demonstrate the regard in which students held him. Ken was one of the first in the country to introduce a course on Computational Fluid Mechanics and Heat Transfer; generations of Cornell students have taken this course. Students testify that as an advisor, Ken obviously prepared and deliberated carefully in his
own mind before meeting with students. Students found him a warm and receptive mentor and guide, in both technical and professional matters.

He was unfailingly willing – eager – to share his knowledge and understanding; he would feel obliged to provide a scholarly, correct answer even to off-hand questions. Ken was always generous, never demanding credit. Of course, he must have appreciated the awards he received from the computer graphics community, but his bibliography shows many co-authorships in cases for which one imagines he was the intellectual leader.

The range of people and disciplines touched by Ken’s generosity is quite amazing, including computational fluid dynamicists, astronomers, analytical chemists, and even a horticulturist (Professor Thomas Whitlow). Tom testifies that his first meeting with Ken not only confirmed his sense that all his grad students should take Ken’s course, but also that he now had a friend and colleague with whom he could share his ideas. Ken always provided sage, succinct advice on Tom’s experiments with plants, wind and dust. Ken was not just generous with time and ideas; he offered a no longer used wind tunnel, which now has been in Tom’s lab for 6 years, helping him with his experiments and reminding him of Ken Torrance, a model colleague, teacher and friend.

Ken’s greatest joy in life was spending time with his large family, including his wife of 48 years, Marcia, his brothers Don and John, his children, Charles, Deborah and Catherine, and all their own families including his six grandchildren. He was very proud of all his family’s accomplishments, and derived great pleasure in following their activities. He had devoted much time and effort to teaching his children, and leading them on camping trips. In recent years, Ken rekindled his passion for classic cars, spending many hours fine-tuning his ’57 Chevy and giving rides.

Ken Torrance was not only a fine scholar and teacher, but he was a supremely good man, responsible, industrious, neighborly and kind, loyal to friends, and loving to his family. He was very proud of his Midwestern heritage, and one supposes he would say that the virtues
just named are simply the expected Midwestern values. Of course, these values found profound expression in his professional life, as his Cornell colleagues well know. Cornell colleagues share a deep respect and affection for this good friend, and deeply mourn his passing.

Donald P. Greenberg, Chairperson; Franklin K. Moore, Zellman Warhaft
Mark Alan Turnquist, Professor Emeritus of the School of Civil and Environmental Engineering, died in Falmouth, Maine due to complications from prostate cancer. He completed his Ph.D. at MIT in 1975 and spent his first few years as an Assistant Professor at Northwestern University. In 1979 he accepted a position in the Transportation Systems Engineering program in Cornell’s School of Civil and Environmental Engineering, where he spent the rest of his distinguished academic career. In 1986, he was promoted to full professor. He retired in 2015 after 40 years of teaching. During his tenure at Cornell he served as Associate Dean of Computing for the College of Engineering. Most significantly, he was a co-founder and long-time Director of the Engineering Management Program for CEE. Through his leadership, this program gained national and international recognition, and was emulated at a number of institutions, including at MIT. He was particularly pleased to advise many accomplished graduate students who went on to contribute to technical advances and leadership roles around the world.

His research career encompassed the development of predictive models of complex systems in which uncertainty played a critical role. His superb analytical skills and experience allowed him to work on an impressive range of problems. As a result, not only did he excel in his purely academic endeavors, but he was also in high demand by agencies and organizations in need of a unique professional to help solve their most complex problems. He collaborated with several organizations, including CSX Railroad, Austrian Railway, General Motors Research Lab, Xerox, the Veterans Administration and Sandia Labs of the Department of Energy.

Early in his research career he made fundamental contributions for developing dynamic network models for railcar management. These models explicitly represented the complex interactions between evolving demands and stochastic availability of resources. They were
both elegant and effective and hence were used productively in the railroad industry for many years.

He also made fundamental contributions to modeling to support the movement of hazardous materials. His work established the need to consider variability in the performance of transportation facilities by time of day and firmly established the value of the availability of different types of information. These insights supported decision-making to strike an appropriate balance between commercial interests and public safety.

Perhaps the most fascinating work he produced concerns the development of a decision support system for weapons dismantlement. At the end of the Cold War, through treaty, the U.S. committed to reduce its nuclear weapons stockpile by dismantling a large number of old weapons. This created a large-scale “reverse manufacturing” problem with inter-twined production planning and logistics issues. Mark led the development of a model to support the dismantlement of nuclear weapons at the Pantex plant in Texas. For this work, Sandia was a runner-up for the Franz Edelman Award from INFORMS (the professional society for Operations Research and the Management Sciences) in 1999.

Mark also developed new ways to optimize the design of distribution systems and the manufacture of products. Among the many advances in this domain, he developed the first methods to effectively incorporate inventory analysis into facility location models for distribution system design and to consider multiple objectives in these decisions. Another advance he fostered was in the creation of analytic methods to manage production lines, which are also queuing networks. Much of this work has been inspired and funded by General Motors and Sandia National Labs. Elements of this work were a key part of the research that received the Franz Edelman Award in 2005.

In January 2017, Mark posthumously received the Secretary’s Appreciation Award from the Department of Energy for work with Sandia National Labs to “answer the President’s call for an ‘all hands on deck’ response to the Ebola virus global health emergency.” In collaboration with researchers at Sandia and the Veteran’s Health Administration, Mark developed a model that could be used both to assess hospital preparedness levels and to improve resource allocation when planning for a surge of Ebola patients. Mark did an incredible amount of work to develop the earliest versions of the model in a very short amount of time. Even after much of the concerns about a wide-scale Ebola outbreak subsided, Mark and his collaborators worked to generalize the model so that it would be “ready to go” for the next infectious disease scare.

His colleagues and superiors at these various organizations universally valued Mark for his contributions to their research progress and problem solving. Everyone praised his exceptional intellect, his creativity, his keen grasp of the analytical essence of problems, and his ability to solve these problems. In addition, they admired his quiet demeanor, his sense of humor, his friendliness and courtesy. With all this success and admiration that he generated, Mark remained a totally unassuming person. He was indeed a great colleague and friend.

Following are some retrospective quotes from professionals outside of Cornell with whom Professor Turnquist interacted on various research efforts:
“Mark’s was among the first dissertations I supervised as a junior faculty member and now 40 years and many dissertations later, it remains among the best! Mark’s contributions to the field of transportation in research, education and service represent a legacy his colleagues and family can be very proud of.” (Professor, MIT) “Mark was a super human being, who was also an outstanding researcher. Brilliant, but modest and simple. It was a privilege to have known him and worked with him for about 30 years. ...GM showered him with many awards.” (Scientist, General Motors Research Labs)

“Mark spent a sabbatical year here (GM Labs) and continued consulting with us beyond that point for many years. ...His insightfulness on how to approach projects and his mentoring of young researchers ... have had a continuing impact at GM for many years. ... As one example, Mark provided some of the key insights for modeling the throughput of production lines. ... This research eventually involved many more people, led to the creation of throughput analysis software and a throughput improvement process that was and is used in [more than] 100 GM plants, [has] saved GM billions of dollars, and won the prestigious INFORMS Edelman Award in 2005. ... [We] have all felt that this was the model for what a successful academic-industry collaboration should be.” (Research Manager, General Motors Research Labs)

Mark also received College teaching awards in 2003 and 2013 and was a recipient of the Chi Epsilon Professor-of-the-Year award in 2006. He was an excellent teacher with exemplary dedication to his students’ learning. Even though it was well known that his courses were challenging with difficult homework and exams, students flocked to his courses. Before upcoming exams, lines typically formed outside his office during his long office hours, and he patiently explained difficult subject matter until the last student was satisfied.

His commitment to his students was truly astounding. As he approached his retirement in 2015, his prostate cancer looked like a losing battle. He no longer had enough energy to stand in front of his class for a whole class period. Most if not all of us, no doubt, would have relinquished our teaching activities. Not so with Mark; he decided to find a way that he could still teach his classes. He videotaped his lectures and made them available online so that his students could hear/see his lectures at their convenience and in a manner that suited their learning preferences. Then, during the Friday lecture time, Mark would come to sit in front of the class to answer any questions about the material they had studied that week. Ultimately, the students enjoyed this approach to teaching.

Mark was known to be a highly intelligent, creative, deep and productive thinker. Yet in his patient thoughtfulness he was neither hasty nor verbose. During technical discussions with Mark, students and colleagues recall his long pauses – almost to the point of the listener perceiving a lack of focus. But the pauses invariably proved to be pregnant, as Mark’s eventual responses were insightful and valuable.

So, too, it was during faculty meetings, when a topic of future research or teaching direction arose, or when administrative procedures were discussed, the conversation would go on for quite a while to give all a chance to express their opinions. Even when the discussion would go back to the starting point and colleagues started repeating themselves, Mark typically did not render a word. Was he paying attention? Was he not interested?
Was he quietly continuing to work on a tricky research problem solution? When finally asked for his input, Mark would suggest an approach or a solution that was right to the point and tended to be accepted across the board by his more talkative colleagues. Gratefully, that also meant that the faculty meeting had finally come to an end!

Mark was born in Jamestown, North Dakota where he spent his early childhood, and then graduated from high school in Hastings, Minnesota. Mark was selected as one of two seniors from Minnesota to be a Presidential Scholar and meet with President Johnson. He was accepted at Michigan State University in the Honors College as a Merit Scholar. There he earned his B.S. degree in Engineering.

Those of us having had the pleasure of spending prolonged hours in a car with Mark on our way to conferences or meetings were sometimes privileged to learn about his childhood in North Dakota.

Mark’s interest in transportation began at a very early age. Mark rode the mail car on the train with his father at work as a young boy, read a book on how to fly a helicopter in elementary school and was ready to try it himself, fixed the farm machinery with his grandfather on the farm, and learned to repair his own cars with his friend who was a mechanic. He knew from an early age that he wanted to be an engineer. Mark also enjoyed maps, remembered names and places easily, and had strong navigational skills. His family had a tradition of always trying to figure out the best path to go somewhere. As his engineering, math and computer programming skills increased, it was natural that he chose an education and profession in transportation engineering and applied operations research.

He had a lifelong enjoyment of baseball, beginning with listening to Milwaukee Braves games from Wisconsin on the radio in North Dakota (they won the 1957 World Series over the Yankees), and collecting and trading baseball cards from bubble gum packs with his best friend. After retirement, he collected baseballs from teams and players that he had followed since his childhood. His collection includes a baseball signed by his high school teammates from the year when they played in the Minnesota state tournament.

His favorite cars were Corvettes, for which he developed a passion after being allowed to drive one belonging to his high school teacher in his youth; he went on to own two of his own as an adult. A photograph exists showing a hillside on the Cornell campus filled with vehicles owned by the Turnquist family, including an inherited light truck from North Dakota, and the hood of an MG that was waiting for years in the Turnquists’ garage for the moment when Mark would finally find the time to restore and reassemble it.

Mark was also fascinated by the sea throughout his life. When his elementary school music teacher played a classical piece, and asked the class to write what image it evoked, Mark wrote “a storm on the sea,” which was a unique answer in landlocked North Dakota. As he grew up, he read sea and naval stories. He loved the idea of the ocean as a place of adventure. It is fitting, therefore, that after decades of residing in Ithaca, NY, he and his wife Lynn moved to the Maine coast at Falmouth to stay near family while his son, Matt, completed his residency in Family Medicine at Maine Medical Center, through which Mark also received his medical care. His final months were spent enjoying the views of the sea from his windows and playing with his granddaughter Emma. His ashes were dispersed
at sea in the presence of his wife Lynn, her siblings, their sons Alan and Matt, daughter-in-law Patty, his granddaughter Emma, and extended family members.

We fondly remember a wonderful friend and colleague of great intellect, dedication, creativity, kindness, humility and sense of humor.

Written by Arnim H. Meyburg (Chair), John F. Abel, Kenneth C. Hover and Linda K. Nozick