

only enjoyed the warmth of the Spengler home, but also ping-pong matches in the Spengler basement. Further matches organized by Ken followed at the home of Joe Smagorinsky in Princeton, and later at then-AMS President Dave Atlas's home in Boulder. Needless to say, the Chinese were quite successful in these friendly rivalries, and the farewell at the airport in San Francisco was marked by warm hugs between Zou Ching Ming, deputy director of the Central Meteorological Bureau, Dave Atlas, and Ken Spengler.

A subsequent delegation to the PRC was led by George Cressman, then director of the National Weather Service. George and his wife then developed warm personal relationships by inviting Chinese delegates from their embassy in Washington to their home. Fran Cressman taught them English at the Embassy and maintains very close contacts with the Chinese today.

If the AMS and the historic Society headquarters that Ken was instrumental in acquiring were his first home, Ken thought of the World Meteorological Organization and the international meteorological community as his second home. Ken's special skills, his humanity, diplomacy, and scientific background led the way for the productive collaboration now taken for granted. Ken attended the annual meetings of the WMO Executive Committee and was always invited to join the U.S. delegation to the quadrennial meetings of the Congress of the WMO. He would act as "ambassador" for the delegation and arrange for the entertainment of other nations' delegates because the U.S. delegation lacked resources for this purpose. One of the famous restaurants in Geneva was named "Spengler's" so that there was never any difficulty in obtaining a reservation when Ken called. The WMO may be the vehicle, but Ken Spengler was certainly one of the engineers of the great advance of our scientific service to the world community.

In the "Salute to Executive Director Kenneth C. Spengler" (*BAMS*, vol. 47, p. 316) on his 20th anniversary as AMS Executive Secretary/Director, then-AMS President Louis Battan wrote, "And wherever he goes, he represents the Society with dignity, enthusiasm, and professionalism." We are all forever part of Ken Spengler's Society and his society.

Few of us have the opportunity to know someone like Ken Spengler. This was a man at once a visionary, a person of great warmth, a gentle yet determined leader, and a skillful diplomat. He was a unique person of many skills, passions, and loves—with his love focused on family. Yet Ken considered the AMS, his country, and his science all part of his "family." For Ken, introducing a new young aspiring meteorology student to Peg, to a distinguished scientist, or to the president of the AMS was a way of welcoming someone new into his greater family.

Beyond our own immediate families and our careers there are few things and individuals who give continuity to our lives and what we love doing. Ken Spengler enlarged and provided the opportunity and platform of the AMS to give a common community and continuity and meaning to so many. Ken ran the Society with a soft touch, but with a tremendous and long-lasting impact. He symbolized the true meaning of a "gentle man" in his relations with every AMS member and to the broad scientific community. For all that, and so much more, all those in the global meteorological and related disciplines should be grateful that Ken Spengler was part of our lives and professions.

—BOB RYAN AND DAVE ATLAS, WITH CONTRIBUTIONS FROM GENE BIERLY, RICHARD HALLGREN, TOM MALONE, WARREN WASHINGTON, AND THE SPENGLER FAMILY

## OBITUARIES

"Lector, Si Monumentum Requiris, Circumspice"  
—*Christopher Wren epitaph in St. Paul's Cathedral*

Indeed, if one should require a monument to Professor Bo Döös, who passed away in Stockholm this January, one only has to watch the evening news on any television station anywhere. The forecasts for tomorrow and the day after and several days beyond presented in elaborate graphics by confidently grinning weathermen rest on a foundation built by him

and a multinational band of visionary pioneers a half-century ago. Their work transformed weather prediction from an erratic black art into a capable applied science.

**BO R. DÖÖS**  
1922–2010

Operational numerical weather prediction had many founding fathers, but its birthday was arguably 24 March 1954, when Bo Döös and Art Bedient produced the first successful real-time numerical prediction using Carl-Gustav

Rossby's barotropic model. Starting from hand-digitized analyses, they turned out a skillful 24-hour 500-mb forecast in only 22 hours using the BESK computer, then the world's fastest. To speed the process, Bo and a colleague invented a pioneering objective analysis scheme, thus completing a numerical prediction system that was put into operation for the Swedish Air Force in the fall of 1954, some six months in advance of the parallel U.S. developments. Years later, Bo steered the massive international program that nourished the evolution of this infant science into the capable tool we enjoy today.

As told to Hessam Taba in an interview for the *WMO Bulletin*, Bo's story had unlikely beginnings. A high-school dropout, he worked as a photographer for a publishing house, but somehow developed a burning interest in mathematics and physics. Taking open university courses, he encountered a sympathetic mentor who steered him into meteorology and eventually recommended him to the great Carl-Gustav Rossby, who was establishing a Meteorological Institute in Stockholm. Galvanized by Rossby, the Swedish Meteorological and Hydrological Institute (SMHI) became a leading world center for modeling research and applications, and Bo became one of its star acolytes. He rapidly ascended the academic ladder, acquiring doctoral level degrees and professorial appointments at the University of Stockholm. A sabbatical at The Florida State University introduced him to the American meteorological community and gave him a Florida driver's license, on which his name was carefully specified by a clerk unversed in Swedish nomenclature as "BO(ONLY) R DOOS"—a souvenir he carried in his wallet until his death! Returning to Sweden, he resumed his academic career, but was soon recruited by SMHI to lead development of a smoothly operating NWP system.

Meanwhile, a tidal wave was mounting in the waters of meteorology. Pioneers had shown that numerical prediction was possible; Lorenz had shown that prediction inescapably had a limit—but that limit was many days beyond then-current capabilities. U.S. President Kennedy had prompted the United Nations to call for a Global Atmospheric Research Program (GARP) to advance predic-



**Bo Döös**

tion and improve understanding of climate. An international conference on a Swedish island assembled a "Who's Who" of experts—including Bo, of course—to define the goals and content of this program. A complex array of research programs and observational campaigns would address the many ingredients that would have to go into improved prediction models. A vital issue was the assembly of a global dataset accurate and complete enough to support meaningful experimentation to improve models. Thus, the central project of GARP was a daringly massive project—optimistically entitled the "First GARP Global Experiment (FGGE)"—to observe the global atmosphere and ocean in unprecedented detail for a useful period of time.

The scope of this effort demanded a partnership between science, represented by the International Council of Scientific Unions (ICSU) and operations, represented by the World Meteorological Organization (WMO). A Joint Organizing Committee was established, supported by a Joint Planning Staff hosted by WMO in Geneva and initially led by Argentine meteorologist Rolando García. After brilliantly launching the JPS, García was soon drawn homeward. A new director was urgently needed, and who could be better qualified than Professor Bo Döös? Arms were twisted, and on 2 January 1971, Bo found himself in Geneva as the manager of the largest project ever attempted in the Earth sciences.

Two score years later, it is easy to forget the magnitude of GARP's ambitions:

- A half-dozen regional observational and research experiments; for example, the GARP Atlantic Tropical Experiment (GATE), which involved an international armada of vessels and aircraft in the tropical Atlantic, and similar tropical monsoon experiments in the Indian (MONEX) and West African (WAMEX) regions
- Coordinated observing system simulation experiments by modeling groups around the world to design an optimum global observing system
- The Global Experiment—FGGE, sometimes termed "The Global Weather Experiment"—that deployed

geostationary and polar-orbiting satellites, ocean buoys, oceanographic ships, an enhanced radiosonde network, reconnaissance aircraft, constant-level balloons, plus every resource of the World Weather Watch to observe the global atmosphere in unprecedented detail

- A network of international planning committees led by the Joint Organizing Committee

For a frenzied decade, Bo and his little hand-picked staff in Geneva shepherded this massive effort to its successful conclusion. Resources and politics were ever-present challenges. Satellite launches lagged. Hoped-for observing systems failed to meet expectations. New systems had to be invented and somehow financed. There were never enough ships. Scientific, technical, engineering, and political crises abounded. Above all, hard commitments of funding and hardware and people had to be extracted from a host of complicated political systems. Bo oscillated around the globe trolling for funds, soothing prickly egos, adroitly cutting bargains, and negotiating the tortuous alleys of international politics. His memoir, *My Global Years*, reads like a combination of Marco Polo and Ian Fleming. Somehow, a Swedish professor morphed into an international diplomat and entrepreneur. In the end, GARP worked because Bo Döös made it work.

And it worked well. The GARP Atlantic Tropical Experiment sparked a renaissance in tropical meteorology and a newly productive partnership between meteorologists and oceanographers. Regional experiments enhanced understanding of monsoons and other regionally important processes. Above all, FGGE launched what has been termed a “quantum leap” in operational weather prediction research and performance. Within a decade, forecast horizons once measured in hours expanded to approach a week. GARP promised much—and delivered much. Beyond its scientific and practical achievements, GARP demonstrated that the world scientific community could reach beyond national and disciplinary boundaries to deal successfully with global challenges on a global scale.

As GARP’s operational phase drew to a close, attention turned to the growing challenge of climate. Bo’s little Geneva office was again a focal

point where the World Climate Program took shape and GARP smoothly evolved into the World Climate Research Program, which continues in robust health to this day. Bo moved on, to managing some international climate studies in Sweden, to a productive tour with the U.S. National Climate Program office in Washington (where he contributed notably to the development of the IPCC), to a post as deputy director and environmental program leader at the International Institute for Applied Systems Analysis in Austria, and finally to semi-retirement in Stockholm, where he continued work on environmental and sustainable development issues. He received many honors along the way, notably election to the Royal Swedish Academy of Sciences, where he and the king shared unfiltered Pall Malls on the smokers’ balcony.

But Bo was much more than the sum of his jobs and his achievements. Rarely have so much intellect, energy, and charismatic charm been wrapped up in such a slender package. Those of us who had been seduced into working with him on the great GARP enterprise soon realized that they had entered a new world and had to learn a new language. “Your paper is wonderful, and I don’t want to interfere in any way” meant that Bo was going to rewrite your worthless drivel. “He’s a nice man” referred to a despicable scoundrel. After-hours cake and wine parties were de rigeur on anyone’s birthday, saint’s day, a national holiday, or Swiss holiday. We learned that it was fruitless to compete with Bo for the attention of interesting ladies. We accepted as gospel that eating herring without adequate aquavit lubrication was almost certainly hazardous to health. We learned that working hard and long on a great enterprise was the greatest of fun. And we watched in awe as Bo returned from dizzying itineraries with ships and planes and satellites and sacks of money in his bulging briefcase, turning the visions of Richardson, Charney, and Rossby into reality. Our years with Bo were our best years. Bo’s years of service to science were some of the best in science’s long history.

So, as we watch the weatherman on the evening news and confidently make plans for the week’s work or the weekend’s play, we should form a few words of thanks to Bo Döös and the other visionary pioneers who made it possible.

—JOHN S. PERRY

## IN MEMORIAM

ELFORD G. ASTLING  
1937–2010