

## Henry Rishbeth: Aeronomy Pioneer

Sidney Chapman published his theory on the formation of ionospheric layers in 1931. With remarkable foresight, the Rishbeth family of Southampton, England, arranged for their son Henry to be born in that very same year. In almost every way that the true ionosphere departs from simple *Chapman Theory*, Henry Rishbeth's name appears at the forefront of those contributing to the more robust understanding of the field that we now enjoy. His passing on 23 March 2010 was a deep loss to family, science colleagues and the broad spectrum of friends worldwide. In a very real sense, it also marked the end of the pioneer generation in terrestrial Aeronomy.

While still in his mid-thirties, Henry had literally "written the book" on the ionosphere (*Introduction to Ionospheric Physics*, with his friend and colleague Owen Garriott), a text that enlightened and molded future generations of space physicists. A master teacher, his writing style conveyed an intuitive understanding of complex processes in a remarkably clear, concise and effective way. Henry's life-long scientific passion was the F-layer! Rishbethian concepts in photo-chemistry (his servo-model) and in electrodynamics (his F-layer dynamo) are standard components of instruction world-wide. Once when I suggested somewhat friskily that "layer" was just old-fashioned Chapman-esq terminology implying a stack of uncoupled pancakes, and that I preferred "regions" in place of D-E-F-layers, his eyes twinkled as he explained that it was the thermosphere and ionosphere that were *regions*, and that within a region there are *layers*. I never challenged his command of terminology again.

Henry earned his BA degree in Mathematic and Natural Science at Christ's College, Cambridge University, in 1954. He then went to Sydney, Australia, where he pursued studies and research in galactic radio astronomy, publishing his first paper in 1956. Radio emissions from Jupiter caught his attention and this led to his first publication on ionospheric physics, a paper that estimated jovian ionospheric processes. Returning to England, Henry completed his MA (1958) and Ph.D. (1960) in Physics at Cambridge, with none other than J. A. Ratcliffe as his advisor. His post-doctoral work was at the Radio Research Station in Slough, and its ionosonde became and remained his touchstone diagnostic for the next 50 years. From ionospheric storms to day-to-day variability of the F-layer, "Let's see what was observed at Slough" was always the entry point to a new project.

Henry moved to Boulder in 1962 to engage in research at the National Bureau of Standards. The call back to Slough came in 1964, and he remained at the Radio and Space Research Station for seventeen years, rising through the ranks of scientific and administrative leadership. From 1981 until his (so-called) retirement in 1996, Henry was back in his true home --- the academic setting in his native Southampton --- teaching, leading a research group, and championing solar-terrestrial physics throughout the UK and beyond. He was a strong advocate of incoherent scatter radar methods and was the UK Project Scientist for the European Incoherent Scatter (EISCAT) project. Henry remained deeply committed to its success in official capacities from 1974 to 1986.

Henry's many colleagues in the United States valued his visits and collaborations. His center of mass was always in Boulder, working with Tom van Zandt, Bill Wright and Ray Roble over the years, and delivering a tutorial lecture at the CEDAR meeting of 1997. Henry was not fond of giant meetings (due in part to his mobility problems from polio that appeared while serving in the Royal Air Force in 1950), but he was very pleased to attend the American Geophysical Union meeting in 1995 to deliver the prestigious Nicolet Lecture.

Henry always enjoyed his trips to Texas to work with Bill Hanson and Rod Heelis in Dallas and to visit with Owen Garriott in Houston. He delighted in time spent with Herb Carlson and the Basus during stop-overs in Washington, and with John Meriwether for research in Clemson. He worked with many other US colleagues, and especially so early in his career. [I am sure I have missed mentioning many in this brief list, for which I apologize.] Henry's trips to Boston University started in 1990 as part of his first faculty sabbatical from Southampton, and continued during most Springs and Falls until a few years ago (he referred to these trips as the Semi-Annual Rishbeth Mid-latitude Effect). Whether in Boston or elsewhere, Henry did not just visit; he worked each and every day, enriching the experience of graduate students, post-docs, staff and faculty.

Professional service was a centerpiece of Henry's work, with astonishing breadth within the UK and worldwide. He held leadership positions in virtually every organization linked to Solar-Terrestrial Physics, as well as proud membership in the International String Figure Association (his mother had published a book on the topic) and, to pursue his love of trains, membership in the Locomotive Society of Great Britain.

To have known Henry also provided the opportunity to know his remarkable wife Priscilla (lovingly called Pril), and his daughters Clare and Tessa. Now with three grandchildren, they collectively form a family of mutual support and individual accomplishment. On behalf of the CEDAR community, we extend our condolences to the Rishbeth family and to his colleagues and friends worldwide.

--- Michael Mendillo  
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25 April 2010

Photo Credit: Joei Wroten, Center for Space Physics, Boston University