

DOCUMENTS OF THE GENERAL FACULTY

**REPORT OF THE MEMORIAL RESOLUTION COMMITTEE FOR
CLAUDE WENDELL HORTON, SR.**

The special committee of the General Faculty to prepare a memorial resolution for Claude Wendell Horton, Sr., professor emeritus, physics and geological sciences, has filed with the Secretary of the General Faculty the following report.

John R. Durbin, Secretary
The General Faculty

**IN MEMORIAM
CLAUDE WENDELL HORTON, SR.**

Claude Wendell Horton, Sr., age 86, of Austin, died, following a long illness, on March 2, 2002. Claude Horton was one of the principal contributors to the development of the Departments of Physics and Geology, and the Applied Research Laboratories of The University of Texas at Austin.

He was born in Cherryvale, Kansas, on September 23, 1915, to Marie Terwilliger Horton and Roy Wesley Horton. While he was still a young boy, his family moved to Houston, Texas, where he completed his public school education and entered Rice Institute (now Rice University). He received a BA degree (honors) with a major in physics in 1935 and an MA degree in 1936, both from Rice. The following year he worked as an assistant seismologist for Shell Oil Company, a popular area of work for physicists at that time. This work marked the beginning of Claude's interest in seismology and geology. During the 1937-38 school year he was a graduate student at Princeton University, but he evidently decided that there were better things to do than graduate work. On November 23, 1938, he married Louise Charlotte Walthall of Houston. He returned to Shell Oil, this time as party chief, where he led a group in exploration geology. He held this position until January 1943, when he resigned to undertake efforts in support of the war.

In May 1943, following a brief stint as an instructor in the Naval Training School at the University of Houston, he joined the staff of the Harvard Underwater Sound Laboratory as a research associate in theoretical physics. He remained at the Laboratory until it closed at the end of the war in the summer of 1945. During this period he carried out analytical studies on several aspects of underwater acoustics and was heavily involved in the design of scanning sonars.

Dr. C. P. Boner, then associate director of the Harvard Underwater Sound Laboratory, recognized Claude's capabilities and, when Boner returned to The University of Texas to start the Defense Research Laboratories (now the Applied Research Laboratories), he asked Claude to join him. The U.S. Navy assigned the newly-established laboratory the task of developing a radar homing system for the new series of surface-to-air guided missiles. Claude immediately demonstrated his strengths in theoretical analysis by making significant contributions to the theory of electromagnetic horn antennas and dielectric waveguides and antennas. He wrote his doctoral dissertation on the subject of the theory of radiation from horns and was awarded a PhD in physics by The University of Texas in 1948.

Claude's contributions were an essential part of the early success of the Defense Research Laboratory. When the Laboratory moved into the field of underwater acoustics, Claude immediately shifted fields and made many contributions to areas of underwater acoustics. In the broad category of echo structure, he and his students, through extensive experimentation, began narrowing the gap with analytical formulations. The significance of the work was in establishing sensor and technology limitations in order to separate out and understand physical processes. The results from simple targets guided the understanding of acoustic scattering from complex targets. This understanding of echo formation, coupled with the recognition of when and how statistical treatment is needed, culminated in the successful implementation for the navy of a device to automatically classify echoes. Claude's interest in sensors, particularly the directionality properties of sensors, resulted in several new transducers, especially transducers-reflector combinations, and, most importantly, in a detailed understanding of nearfield properties of directional transducers. This knowledge was exploited in a method of predicting farfield performance of large transducers from nearfield measurements.

Closely related to echo structure studies is another broad category of reflection and scattering. The problems of special interest here are surface, bottom, and volume effects in contrast to discrete target effects (echo formation), although there is considerable overlap in the problems. These studies resulted in the ability to determine when a stochastic treatment is required and in useful statistical treatments of data.

Each of these areas demonstrates a significant contribution, but it is important to keep them in perspective. It was Claude's ability to provide the important interrelation of problems from several fields that was perhaps his greatest contribution. Electromagnetic wave theory and geophysics have both been mentioned. Perhaps not as obvious is the tie between acoustics and signal processing. In the same category is the development of methods of treating data. Routine processing of large quantities of data to extract statistical significance could not have been done a few years back. In two invited papers he gave to the ASA (November 1970 and October 1973), Claude interpreted the significance of this transition to the use of higher order statistics. Claude did not just observe this transition, he led it. Consistent with the breadth of his analytical capabilities was the ability to relate to experiment design and interpretation. Claude saved many experiments (and experimenters) by understanding equations. In 1980, for his work on underwater acoustics, Claude was awarded the very prestigious "The Pioneers of Underwater Acoustics Medal" from the Acoustical Society of America, of which he was a Fellow.

In March 1946, Claude joined the faculty of the UT Austin physics department. He advanced rapidly up the academic ladder to become an associate professor in 1950 and a full professor in 1953. He served as chairman of the department from 1957 through 1962. It was during this period that the department started the effort in relativity with the addition of Alfred Schild and other important figures to the faculty. Claude played an especially vital role in education for the acoustics community. In a period in which physics departments in general were phasing out of acoustics work, he continued to teach courses in the subject and, by serving as supervising professor, provided an avenue by which graduate students could specialize in acoustics. During this period he supervised the work of 27 students for the PhD degree and 30 for the master's degree. Among his students were leaders of the growth of science and technology in Austin, including Chester McKinney and Loyd Hampton, former directors of the Applied Research Laboratory, Richard Lane, founder of Tracor, and James Truchard, a cofounder of National Instruments. In 1965, the Department of Geological Sciences decided to strengthen its program in geophysics. Budget constraints and other commitments precluded new hires in geophysics at the time, and Claude graciously taught a graduate and undergraduate course in geophysics during 1972-75 and also served on graduate student committees. His physics background provided a different perspective on various pedagogical departmental issues and breadth on PhD committees.

In 1976 he elected to take early retirement, bringing to a close a highly productive 31-year career in the UT physics department. His research work has been documented in some 69 published papers (18 in *The Journal of the Acoustical Society of America*), numerous technical reports and oral presentations, and 4 patents. In response to a request from the U.S. Navy, he wrote a textbook, *Signal Processing of Acoustic Waves*, which was published in 1969. Details of his published works are contained in the collection of published papers which was issued by Applied Research Laboratories, The University of Texas at Austin, in 1978. Although electromagnetic and acoustic wave propagation were his primary interests, the bounds on his range of intellect is reflected in two publications: "On the Mechanics of Spitting in the African Spitting Cobra" and "Scientists on Postage Stamps."

He was survived by his wife, Louise, a writer and artist; his son, Wendell Horton, a professor of physics at the University, and wife, Elisabeth; and his daughter, Margaret Elaine Morefield. He is also survived by his grandson, John W. Horton, and his wife, Johauna, of Santa Barbara, California, and their children, Jaclyn, Jayna, and Joseph, and his grandson, Mike A. Horton, and his wife, Melissa, of Santa Clara, California. Claude Horton was a gentleman and scholar in the truest sense of the words. He served his country with his science, his university with his wisdom and insight, and his family with devotion and care. He will be missed by his friends, colleagues, and family.

This memorial resolution was prepared by Professors Austin M. Gleeson (chair), Thomas A. Griffy, Earle F. McBride, and A. Wilson Nolle, and Chester McKinney, director emeritus of the Applied Research Laboratories.

Distributed to the dean of the College of Natural Sciences, the executive vice president and provost, and the president on July 30, 2002. Copies are available on request from the Office of the General Faculty, FAC 22, F9500. This resolution is posted under "Memorials" at: <http://www.utexas.edu/faculty/council/>.