ChE educator

Hank Van Ness of R. P. I.

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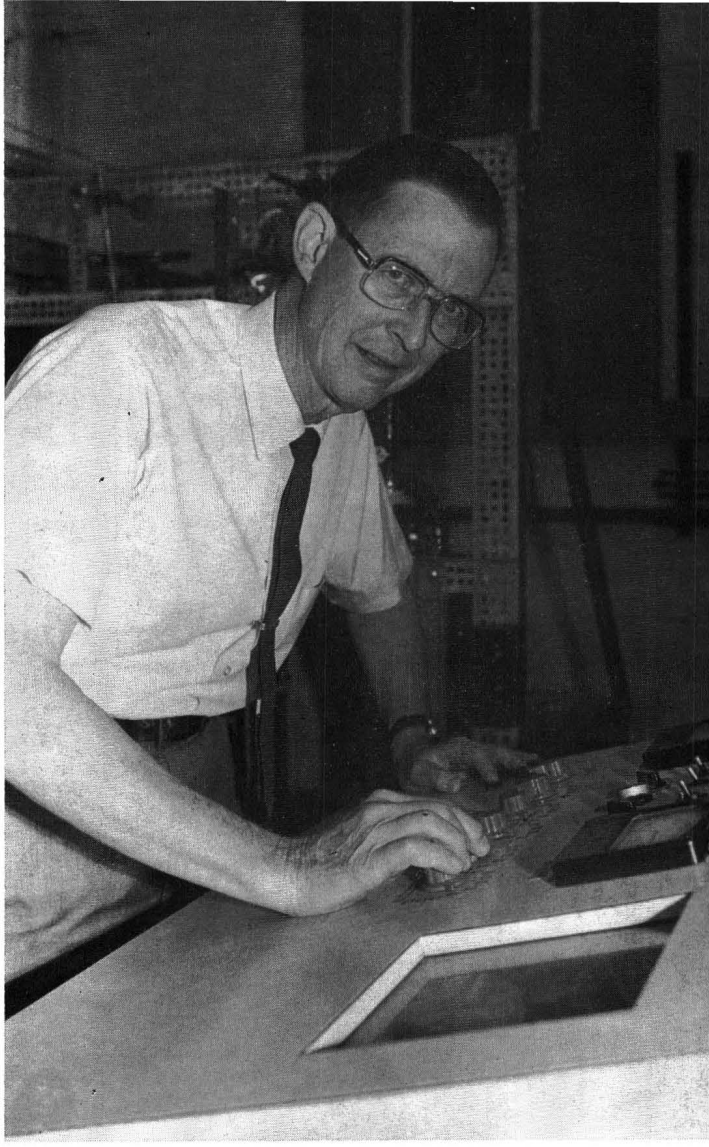
"Hank's excellence in teaching provided the inspiration to make *me* want to teach." "Gibbs invented chemical thermodynamics but, for chemical engineers, it was Hank who transformed Gibbs' invention for everyday use." "The Van Ness isothermal dilution calorimeter and isothermal dilution total-pressure cell have revolutionized the arts of obtaining heats of mixing and low-pressure VLE data." "I have only a few heroes in intellectual work: Hank is one of them, because of his honesty, his willingness to grapple with difficult problems, and his desire and ability to put across principles to learners at all levels."

These quotes from fellow educators exemplify the high regard in which Hank Van Ness is held by his colleagues and former students, and characterize—as well as a few sentences can—the variety of accomplishments of a distinguished chemical-engineering educator.

ORIGINS AND EDUCATION

Hendrick Charles Van Ness was born in 1924, in New York City. His Dutch ancestry—which he frequently invokes to explain such attributes as common sense, stubbornness, brevity, and thrift—has a solid American base: Van Nesses settled in Northeastern New York State in the 17th century. When he was still a child, Hank moved northward with his parents to Greenwich, New York, where he attended grammar and secondary schools.



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In 1941, Hank entered the University of Rochester, from which he obtained a B.S. (1944) and M.S. (1946) in chemical engineering. During this time he also obtained his first experience as a classroom teacher, serving as an instructor to returning veterans of World War II. In 1947, he joined M. W. Kellogg in Jersey City, but left in 1949 to pursue his PhD at Yale University. At Yale, he did research with B. F. Dodge, studying the hydrogen embrittlement of steels. After completing his doctoral studies, he spent four years as an assistant professor at Purdue University, which he left in 1956 to join the staff at Rensselaer Polytechnic Institute. He has been at Rensselaer ever since.

RESEARCH AND SCHOLARLY WORK

Hank's publication list begins with the year

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1955. Of his first five papers, four were on the subject that would soon become his area of specialization: classical thermodynamics. These early papers covered a broad range of topics: equation-of-state calculations, solution thermodynamics, the thermodynamic analysis of processes, and—significantly—an experimental effort (coauthored with H. W. Schnaible and J. M. Smith) on the heats of mixing of liquids.

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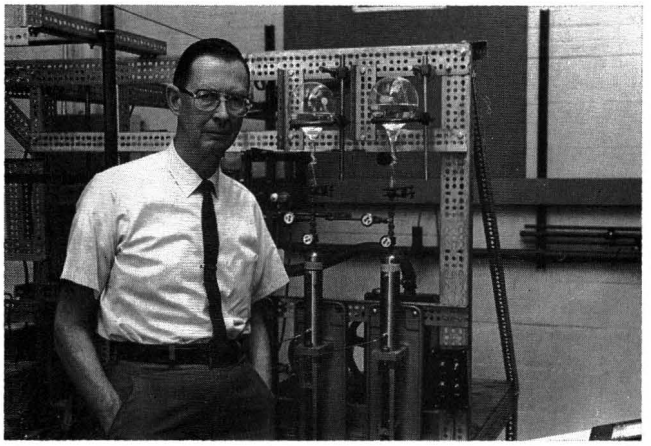
Economy in data collection requires special resourcefulness and care in the data reduction and analysis. There is of course a vast network of equations relating the various thermodynamic properties, and these can be used to special advantage in reducing and analyzing mixture data. However, when Hank entered the field, classical solution thermodynamics was understood and practiced well by only a few dozen experts. Finding existing treatments of the subject incomplete or incoherent, he systematized and expanded earlier work into a logical, consistent thermodynamics of solutions, incorporating a clean and rational system of postulates and notation. While much of this work appeared originally in the technical literature, most of it has found its way into textbooks (his own, and those of others).

Hank's research continues to focus on solution thermodynamics. For the past ten years, he has directed a program of collecting precise VLE and heat-of-mixing data for ternary mixtures and their constituent binaries. As an adjunct to the experimental effort, he has critically examined and developed new data reduction procedures for such mixtures and has published significant papers on representing the excess Gibbs energy for highly non-ideal mixtures and for mixtures containing a supercritical component. Current work includes studies on VLE for systems displaying partial miscibility in the liquid phase and modeling efforts incorporating chemical theories of solution.



Hank takes a break for the photographer's benefit.

TEACHING AND PROFESSIONAL ACTIVITIES

Hank is probably best known to chemical engineering educators and students through his many textbooks, monographs, and handbook articles. No one needs an introduction to "Smith and Van Ness," a classic (now undergoing another revision) that has captured roughly 75% of the American market for undergraduate chemical-engineering thermodynamics texts. Other books include *Basic Engineering Thermodynamics, Understanding Thermodynamics, Classical Thermodynamics of Nonelectrolyte Solutions,* and the *Schaum's Outline of Thermodynamics.*

The popularity of Hank's writings reflects an important attribute of Van Ness the educator: he

does not merely "present" a subject, he *explains* it, and well. Clarity, organization, and a sense of style are as much features of a Van Ness opus as are carefully-chosen examples, rigor, and a finely tuned appreciation for the concepts most likely to bedevil the student. Van Ness productions are as crystal-clear as the topic allows, but never watered-down. The level of presentation in his undergraduate texts is continually augmented to reflect the state of the art.

Hank's contributions to chemical engineering education do not end at the bookstore. At Rensselaer, he is considered by both students and colleagues to be one of the best instructors in his department. Besides projecting an understanding of and devotion to his subject, he manages to communicate that learning is fun, and that *he* is still learning. Other educators who have sampled his courses view him as a "teacher's teacher," and indeed many of his former students have become outstanding educators. They all attribute much of their success to his instruction and example.

For Hank, education continues long beyond the university classroom. In 1978, he organized and supervised a short course for college teachers, "Teaching Applied Solution Thermodynamics." Since 1981, he has run a short course in the AIChE Today Series, "Fluid-Phase Equilibria for Process Calculations." He serves on the editorial boards of three technical journals, and is a two-term member of the AIChE Programming Committee on Thermodynamics and Transport Properties. In all of these endeavors, his special efforts reflect an honest concern for the needs of the practicing educator or engineer, and evaluations of the short courses affirm his success.

VAN NESS—THE MAN

As a recital of his accomplishments suggests, Hank is an unusual person. However, his technical interests—inspired by a high school mathematics teacher, with whom he has recently enjoyed several chance reunions—are augmented by several totally unrelated enthusiasms: most notably music, gardening, and hunting. Although he can normally be found at the office or in the lab seven days a week, there are particular times of the day or year when one can count on Hank's absence. In the early morning (unless he has an 8 o'clock class), he confronts Chopin and Mozart at the Steinway. Many summer afternoons are spent in the vegetable patch, attending to the cukes and tomatoes, and plotting against the ravaging woodchucks. And, at certain times in the fall, he travels northward to the homestead to pursue the pheasant and partridge. (His relatively Spartan office boasts a single portrait: that of *Bonasa umbellus,* the North American ruffed grouse.)

At the personal level, notwithstanding his apparent Dutch astringency, Hank is an eminently approachable person. Whoever it may be—a student with a classroom question, a colleague with an interest in adopting one of the Van Ness dilution devices to his own needs, or an industrialist with an ingenious and profitable processing scheme based on a subtle violation of the Second Law—Hank has time for serious discussions with anyone who has "done his homework." Ten-minute questions frequently generate one-hour (or several-page) answers. "Knowledge and Thoroughness" — Rensselaer's motto — characterize Hank's aproach.

In recognition of his considerable contributions to chemical engineering education as a scholar, author, teacher, and administrator, Hendrick C. Van Ness was recently appointed Institute Professor of Chemical Engineering at Rensselaer. □