

1991 C.V. THEIS AWARD

Citation

It is my pleasure to serve as citationist for the presentation of the 1991 C.V. Theis Award to Herb Skibitzke. Herb began his career in ground-water hydrology with the U.S. Geological Survey in 1949 as a mathematician with the Arizona District. During his career with the Survey, he had the enviable opportunity to work with many of the ground-water scientists in the Survey who laid the foundations for modern ground-water hydrology, and in his own right, to develop into a nationally and internationally renowned ground-water researcher.

Early in his career (1950s) Herb was tapped by Dr. C.V. Theis to work on the problem of disposal of radioactive wastes in underground pits and the effects of this disposal on contamination of ground water. During the rest of his career, Herb maintained a close relationship with C.V.

Herb rapidly earned a reputation among his colleagues as having the unusual capability for pinpointing the particular hydrologic principles vital to successful practical analyses of many water problems. He devised new mathematical equations to better describe the behavior of ground-water systems. He also developed new equipment and techniques for collecting hydrologic data including pioneering the use of remote sensing techniques for hydrologic purposes by the U.S. Geological Survey.

As if these accomplishments were not enough, Herb pioneered the development and application of electric analog simulation to solve real-world, complex aquifer problems. To the practicing ground-water hydrologist in the early 1960s, Herb's pioneer work in the use of analog computers to solve ground-water problems opened a whole new universe that was almost inconceivable or beyond imagination at a time when the state of the science for analyzing responses of aquifer systems to stress was limited to aquifer testing and the application of image-well theory.

Herb is an unusually innovative multi-talented person with broad scientific interests. He is in reality an expert in electronics, in electronic equipment, in ground-water hydrology, in many aspects of geomorphology, and in remote sensing from airplanes.

Herb has had many honors bestowed upon him during his 30-year career with the U.S. Geological Survey and during his consulting career. The American Institute of Hydrology takes pleasure in adding to his honors its C.V. Theis award. I will end this citation with a quotation from C.V. Theis concerning Herb that is very appropriate for this occasion: *"In all my association with Skibitzke, I have found two characteristics paramount: a brilliant, imaginative, innovative mind, and a devotion to the Survey, coupled with a generous appreciation of his colleagues in it. I know no one to whom Goldmith's old phrase is more apt: And e'en his failings leaned to virtue's side."*

Mr. President, Members of the American Institute of Hydrology, and Guests, it is a real honor to be able to present to you, Herbert E. Skibitzke, the American Institute of Hydrology's 1991 C.V. Theis Awardee.

Joseph S. Rosenshein

Response

The American Institute of Hydrology could have given me no more meaningful honor than the C.V. Theis Award. I am deeply grateful.

The science of hydrology took a giant leap forward with the life and work of C.V. Theis. His insight and dedication were responsible for the introduction of modern methods to analyze ground water systems.

My first assignment as a young mathematician in the U.S. Geological Survey's Ground Water Branch, in 1950, was to assist Dr. Theis in a research program for the Atomic Energy Commission. It was my great fortune that the assignment lasted for a full decade. During that time, I gained an enduring fondness and respect for him. Now, I am concerned that the concepts he advanced are applied to problems to which they do not pertain.

In 1935, Dr. Theis wrote a paper that changed the course of hydrologic analysis. It almost cost him his job with the USGS. It almost cost him his job with the USGS. Only because one man recognized the spark of genius in his work and pleaded his case was he retained. His work was published and the non-equilibrium equation that has become known as the Theis Equation became public domain. Without benefit of computer techniques, he set about to find a solution to the Boussinesq Equation developed in France more than thirty years earlier and arrived at a method to analyze water supply problems.

Early in our association, Theis told me that the use of his equation had polarized the profession by pitting the engineer against the geologist. According to Theis, the engineer felt that he could solve the problem if geological considerations were eliminated, while the geologist, who was shocked at the exclusion of his geological data, had little regard for the engineer's hydrological data. Theis felt that a mathematician might close the gap by writing equations to determine ground water flow for any geological system.

With Theis' guidance and support, the finite difference equations for ground water were written in the early 1950's. Theis believed then that computers were the key to solving the equations. When the digital computers of the day proved inadequate to handle the multiple of simultaneous equations, electrical analogs were tried and found to simulate the conditions of ground water flow. Thus, ground water computing was initiated.

We sometimes think that the problems surrounding contamination of the ground water systems are new. Theis was studying the phenomenon in 1948. That was when the AEC belatedly recognized that nuclear wastes buried in or near ground water aquifers just might cause a problem. Laboratory and field research directed by Theis were the first to show the importance of heterogeneity and permeability in the spread of contaminants. Today, he would be the first to caution against the widespread use of the formula he developed for water supply studies to analyze the completely different problems of contaminant movement.

Theis the scientist had a profound effect on the profession of ground water hydrology. Theis the man had a profound effect on his associates. The dignity and kindness which characterized his dealings with both budding and seasoned professionals gave each a sense of self esteem. Gladys, his beloved wife - a sculptress of no small renown, joined him in bestowing elegant hospitality on even the lowliest of fellow workers. The science and society are immeasurably richer for their contributions.

Herbert E. Skibitzke