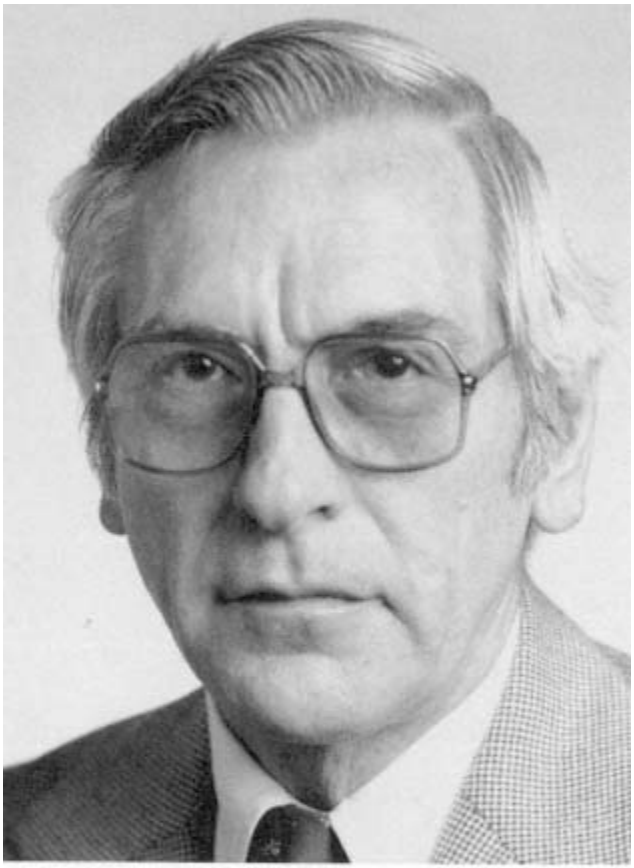

# Francis Louis VerSnyder

1925-1989

By Maurice E. Shank

Francis L. VerSnyder, retired assistant director of research for materials technology, United Technologies Research Center, and one of the world's most distinguished high-temperature metallurgists, died suddenly November 28, 1989, at the age of sixty-four.

Frank, as he was known by everyone, was born in Utica, New York, May 27, 1925, and grew up in Watertown, New York. His mother died in giving birth to him. Due to the circumstances of his early life, the principal influence in his youth was the parish priest of the local Roman Catholic church. During his high school years and after graduation he worked for the Watertown Highway Department until he was drafted into the United States Army at age eighteen in 1943. After his discharge from the Army in October 1945 he entered Notre Dame University, South Bend, Indiana. He graduated in 1950 with a B.S. in metallurgy. While at Notre Dame he married Katherine Kelly of Watertown.

In 1954 Frank joined the General Electric Company in Lynn, Massachusetts, working on problems of high-temperature metallurgy for early turbojet engines. His last position in Lynn was as supervisor of metallography and high-temperature testing. In 1954 he received the Henry Marion Howe Medal of the American Society for Metals, his first professional recognition, for work performed a year earlier on microconstituents of high-temperature alloys.

In 1955 he transferred to the General Electric Research Laboratory in Schenectady, New York, and remained there until 1961. Believing that his future at the laboratory was limited by his lack of a doctorate, he accepted an offer to become head of alloy and materials development in a newly formed research and development operation at Pratt & Whitney, United Aircraft Corporation (now United, Technologies) in East Hartford, Connecticut.

At Pratt & Whitney, the wide world of opportunity opened for his initiative, technical inventiveness, and ability to innovate by carrying his inventions into production and application. He proceeded to invent the directionally solidified high-temperature airfoil, precision cast, complete with intricate cooling passages, for use in advanced gas turbines. From this flowed the development and application of the mass-produced single-crystal airfoil. He was awarded a pivotal U.S. patent, "Gas Turbine Element," covering this "quantum leap" in the state of the art. The work opened a new field of applied high-temperature metallurgy, with more than one hundred subsequent patents issued to others. Use of these materials provides greater durability and substantial fuel savings in commercial aircraft, and allows higher thrust, increased fuel efficiency, longer life, and greater maneuverability and range in military applications.

The first production application of directionally solidified blades was for the TF30-P100 engine powering the F111 fighter-bomber. During the 1970s every new Pratt & Whitney engine model entering production contained directionally solidified airfoils, including engines that powered the Boeing 747 and Douglas DC-10-40, and the F-100 engine that powered the Air Force F-15 and F-16 fighters. Directionally solidified airfoils are also used, under license, in the space shuttle main engine, and in engines built by General Electric, Garrett Turbine Engine Company, and Rolls Royce. Beginning in 1978 and subsequently, single-crystal turbine airfoils were introduced in both military and commercial engines, including those for the advanced F-15 and F-16, the Boeing 747, 767, and 757, and the Airbus A310.

In recognition of his achievements, Frank was elected to the National Academy of Engineering in 1981. He was a member of many professional societies and was active on committees and boards relating to society organization, awards selection, and professional matters. He served on many National Research Council ad hoc committees and on the Peer Review Committee of the National Bureau of Standards. Frank was the author of forty-seven papers and technical presentations.

In 1965, United Aircraft honored him with the George Mead Gold Medal for Engineering Achievement. Subsequent honors included the Dickson Prize Award and Medal of Carnegie Mellon University in 1972; the Francis J. Clamer Medal and Life Fellowship of the Franklin Institute in 1973; and the College of Engineering Honor Award of the University of Notre Dame and the Engineering Materials Achievement Award of the American Society for Metals in 1975. In 1986 Frank received the National Medal of Technology of the U.S. Department of Commerce from President Ronald Reagan at the White House.

A few words must be said about Frank's World War II military service, which had a profound affect on his subsequent life and philosophical outlook. He served as a rifleman in the 54th Armored Infantry Division in the Mediterranean and European theaters of operations. Much of the time he served as a first scout —the soldier who is out in front of the men out in front. He volunteered for this assignment because he "didn't want anyone to tell him what to do." His campaign ribbons had four battle stars for the Central Europe, Rome-Arno, Southern France, and Rhineland Campaigns, plus a bronze arrowhead for the invasion of Southern France. He was decorated with the Purple Heart, with Oakleaf Cluster, for wounds received in action in May and October 1944. Frank was on many night patrols and on a bitterly contested beach head in Italy. Once, in a position overrun by the Wehrmacht, with two companions he hid for three days underneath the duckboards until the position was retaken. His companions suggested surren

der, but he told them he would kill them before he would let them do so. Later in the war his division overran and defeated the Waffen SS unit that had committed the massacre of American troops at Malmedy, Belgium. He said that the battle was fought to the death, with no surrender and no prisoners. His final action was the liberation of a Nazi concentration camp.

These experiences in the face of battle, with life and death encountered in an intensity of emotion not known in peacetime, left memories that he could not bear to recall and yet could never forget. They left him with an ever-present sense of the inevitability of life and death. On several occasions, being notified that he was about to receive one of his numerous awards for professional achievements, he would quote from Thomas Gray, eighteenth-century author of "Elegy Written in a Country Churchyard": "...paths of glory lead but to the grave."

Withal, Frank was a man of great charm, with a wry and sometimes self-deprecating sense of humor, well read in philosophy and history. He had a fierce sense of independence and an extraordinary sensitivity to the motivations of those with whom he came in contact in the industrial world. Highly principled, he was concerned always that he take the right action for the right reason.

Frank was impressive as a professional colleague and charming as a friend. He had the skill and good fortune to change completely the technology of high-temperature metallurgy for gas turbines, thus opening a whole new area of research and development for others who today pursue the professional ramifications of his developments.

He is survived by three daughters, Connie Welling of Mt. Vernon, New York, and Christine and Kelly of Hamden, Connecticut; two grandsons, Justin and Alexander Welling; and his son-in-law Martin Welling.