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# WILLIAM G. PFANN, 1917 - 1982

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*Bell Labs zone melting pioneer dies suddenly*

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William G. Pfann, a pioneer in the science of materials, died Oct. 26, 1982, only weeks after he retired from Bell Laboratories. His sudden death shocked and saddened his colleagues and friends at Bell Labs, who were many, and throughout the international community of materials scientists.

Born in New York in 1917, Bill Pfann joined Bell Labs at the age of 18; when he retired, he had been there 47 years. Bill thus matured as a professional during his tenure at Bell, which consequently shaped his interests and outlook. By similar measure, his research, his personality, his ideas and his energy left an indelible mark on the institution as well. His pragmatic, purposeful and enthusiastic approach to every endeavor, his high standards of honesty in experimentation and reportage, and his unprejudiced approach toward the new, the untried, even the heretical served to define the word *scientist* for a large number of his peers and acquaintances.

Pfann received a bachelor's degree in chemical engineering from New York's Cooper Union School of Engineering in 1940. Early in his career he helped develop "catwhisker" crystal detectors for use in radar receivers. He is best known for his work on purification of materials by zone leveling and zone refining, and the growth of single crystals by zone melting. Indeed, his classic *Zone Melting*, published in 1958, and again in a revised second edition in 1966, has served to educate several generations of materials scientists. In this field, Bill Pfann was not simply an educator, but its inventor and master as well. His contributions to the art made possible the development of today's semiconductor technology by allowing



**William G. Pfann**

the preparation of high purity germanium and silicon, whose properties could be subsequently modified by impurity doping. Pfann's patents number 65 in all, most in the field of zone melting. His interest in freezing phenomena never flagged; during the last few years he had been interested in their application to the preservation and storage of whole human blood.

Less well known is his work on electrical contact erosion, in which he discovered a method of eliminating the "contact bridge" erosion problem. Also overshadowed by his work on zone melting is his pioneering work on conception and development of the first transistor to be manufactured (type A). He also contributed basic patents and papers on alloying and

diffusion methods of transistor fabrication.

The breadth of his contributions to materials research was evidenced in 1968, when he received the American Chemical Society's first Award for Creative Invention. The selection was made from among all holders of U.S. patents issued in the previous 17 years in the chemical field.

He was elected to the National Academy of Sciences, and was a Fellow of the Metallurgical Society and the American Society for Metals. He was also a member of the American Institute of Mining, Metallurgical and Petroleum Engineers, the American Physical Society, the American Association for Crystal Growth and the Society for Cryobiology.

Professional activities aside, Bill Pfann was a valued friend to many at the Labs. An active sportsman, he remained a competitor at tennis, badminton and handball. He also enjoyed solitary pursuits, hiking and swimming, and composed poetry on the themes that seemed to him central to nature and humanity. One of his poems, "Creativity," was read at his funeral.

*The mind goes on and on,  
Exploring a vast universe  
Of ideas*

*Without end.  
But the body  
Is subject to  
The rhythm of day and night,  
The need for sleep.*

*The mind  
Must therefore bide its time,  
And find the chance  
To make that gallant leap  
Between distractions of the day  
And the magnetic pull of sleep.*

Bill Pfann will be missed.