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VOICES OF INNOVATION

George Heilmeier: Flat-Panel Pioneer

The American researcher won the Kyoto Prize for his LCD breakthroughs at RCA -- which lost out to Asian rivals

While studying for his 1962 PhD in electronics from Princeton University, George H. Heilmeier worked part time at RCA Corp.'s David Sarnoff Research Center, better known as RCA Laboratories. There, Heilmeier was exploring solid-state microwave devices -- early forerunners of the chips in today's cellular phones and radars. But the friend with whom he commuted to RCA Labs kept telling him about research on novel devices called organic semiconductors. Soon, Heilmeier itched to switch.

His boss helped put Heilmeier on a path that made him an icon of U.S. innovation in both civilian and military circles. "He told me: 'Look, there are very few times in your career when you can do something completely different [and] have a chance to break new ground.' So I decided to do my thesis on that." His dissertation on organic semiconductors led to a half-dozen scientific papers -- and then to a breakthrough discovery at RCA Labs: the first key to a practical liquid-crystal display (LCD). That was in 1964. Heilmeier was 28.

Wary of rivals, RCA immediately blanketed the project in secrecy. In 1968, Heilmeier's handiwork was finally unveiled with much fanfare about LCDs being the future of TV sets. But the pioneer of color-TV tubes turned stingy at funding further LCD development. In Japan, computer and TV makers had the opposite reaction: They pounced on the technology and invested in long-term development. Today, Japanese companies and newer rivals in Korea and Taiwan dominate the \$39 billion LCD business.

RCA's dropping the ball "was a shame," says Heilmeier, now 69. "But our wounds were self-inflicted." Like Xerox Corp. (), which failed to exploit some of its key inventions at Xerox PARC, RCA may have been blinded by its earlier triumph in color TV. "Once you have a success of that magnitude," he says, "it's difficult to convince people that [a new technology] could be the long-term future."

Frustrated, Heilmeier left RCA in 1970, never to return to LCD research. But he did go to Japan in mid-November of this year to pick up a Kyoto Prize for his LCD innovations. Nicknamed Japan's Nobel Prize, it came with \$425,000.

After RCA, Heilmeier expanded his horizons, heading the Defense Advanced Research Projects Agency from 1975 to 1977. "We did some really interesting stuff at DARPA," he says, some of which he still can't discuss. Just before leaving, he was at the hush-hush Area 51 airfield near Nevada's Groom Lake when the first stealth plane took flight -- research that spawned the famed F-117

stealth bomber.

Heilmeier's next stop was chipmaker Texas Instruments Inc. (), where he was promoted to chief technology officer in 1983. His strategies helped TI survive the 1980s, when Japanese rivals decimated the U.S. semiconductor industry, often by selling chips in the U.S. at below-cost prices.

As a new decade dawned, Heilmeier says he "got the bug that I wanted to run my own company." In 1991 he joined Bellcore Corp. as CEO, piloting its transition from research house for the Baby Bells into a competitive and profitable research powerhouse. He retired in '97 after Bellcore (now Telcordia Technologies Inc.) was acquired by SAIC Inc., a research outfit with hefty defense contracts. He still consults for SAIC and Telcordia, among others.

Heilmeier is generally upbeat about the outlook for U.S. science. But he does have some concerns. "There's more hype in research than ever before," he says. "A lot more." Nanoelectronics is especially guilty, he believes. "The hypemeisters may be good at winning funding, but you don't win by dumping in money. You win with insightful ideas."

By Otis Port