

Obituaries

David H. Hubel, 87, Nobel winning Harvard professor

By Bryan Marquard
GLOBE STAFF

Harvard professor David H. Hubel, working in an uncommonly seamless collaboration with his colleague Torsten Wiesel, spent more than 20 years determining how nerve cells work together in a network to turn visual information about light, darkness, and color into images the brain understands.

For that work they shared the Nobel Prize for medicine in 1981. Although they researched as equals, Dr. Hubel often was the principal writer, introducing the pair's wit and deft metaphors into papers that recorded their experiments and shed light on more than just their initial prize-winning discoveries.

"They figured out an absolutely fundamental series of calculations that the cortex performs in the visual system, but it turns out it's true for how the whole brain works," said Margaret Livingstone, a professor of neurobiology at Harvard Medical School and a scientific collaborator of Dr. Hubel's since 1975.

In an autobiographical sketch on the Nobel website, Dr. Hubel wrote that throughout his life he invested "a disproportionate amount of time" playing musical instruments. As he turned 87 in February, he started learning the oboe, and while his health subsequently faltered, he began taking lessons to add Italian to his repertoire of languages. Dr. Hubel died of kidney failure Sunday in his Lincoln home, where he moved a couple of years ago after living in Newton for decades.

"There has been a myth that the brain cannot understand itself, the brain or the mind," Dr. Hubel said at an October 1981 news conference held after it was announced that he and Wiesel were sharing that year's Nobel for medicine with Roger W. Sperry of the California Institute of Technology. "It is compared to a man trying to lift himself by his own bootstraps. We feel that is nonsense. The brain can be studied just as the kidney can."

With Wiesel, Dr. Hubel identified how neurons along the visual pathway extract increasingly complex information from the pattern of light cast on the retina, and construct an image.

They described different kinds of brain cells in the visual cortex, most famously discovering that some of those cells respond to lines and edges of objects. The scientists also determined that the cells are arranged in a precise architecture of columns.

"David referred to it as a

crystalline organization," said Bevil Conway, a friend and associate professor of neuroscience at Wellesley College. "The power of that idea was that it simplified the problem of understanding the visual cortex. One didn't have to understand how the whole visual cortex worked, only one crystal within it."

Conway added that Dr. Hubel "approached the central nervous system with the clarity of a conviction that it should be understandable like a toaster, and that you should be able to take it apart and see what all the bits do, and understand it as part of a broader machine."

Dr. Hubel also liked to drop disarming images into his writing. During his Nobel lecture, delivered in December 1981, he described "a polka-dot pattern of blobs" that appeared in a set of experiments on a monkey's brain, and said: "It is as if the animal's brain had the measles."

Characterizing his scientific partnership with Wiesel, Dr. Hubel said that "when a collaboration works, as ours has, the ideas . . . clicking into place often occur simultaneously." He added that "usually neither one of us has known [or cared] exactly where or from whom ideas came from, and sometimes one idea has occurred to one of us, only to be forgotten and later resurrected by the other."

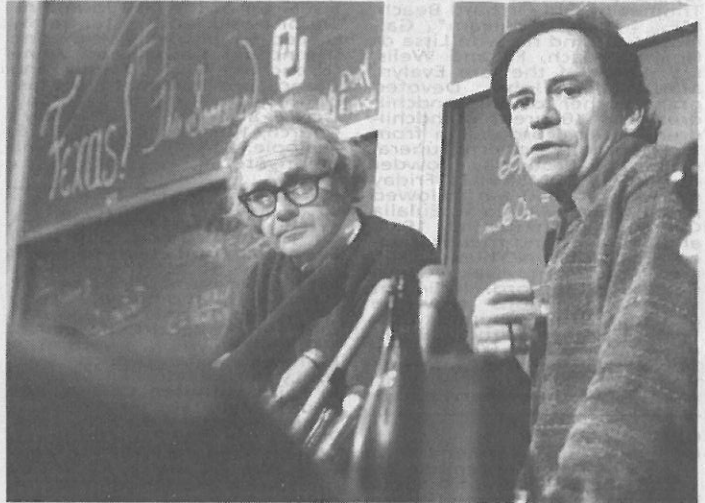
Dr. Hubel's quarter-century of work with Wiesel was "one of the most beautiful collaborations in science," said the writer and neurologist Oliver Sacks. "Something I found immensely moving was seeing Hubel and Wiesel together talk about their long collaboration. They're so different, and yet so complementary, and it was a joy to hear the two of them together."

David Hunter Hubel was born in Windsor, Ontario, where his parents had moved from Detroit. The family relocated to Montreal when he was 3, and he retained dual US-Canadian citizenship because of his parents.

Attending Strathcona Academy, he had a history teacher who corrected the students' weekly essays "with red ink, and was brutal in her comments," he wrote in his autobiographical section of "Brain and Visual Perception," a 2004 book he coauthored with Wiesel about their long collaboration.

"I learned more about writing from her than anyone before or since," Dr. Hubel wrote.

Wiesel, a professor emeritus and former president of Rockefeller University in New York City, said "some of the reason



1982 FILE/HARVARD MEDICAL SCHOOL, PUBLIC AFFAIRS

David Hubel (left), with his colleague Torsten Wiesel, worked to determine how nerve cells turned visual stimuli into images in the brain.

for why we succeeded in our work and presenting it to the world was due to David's clear writing. He was a master when it came to that."

Though his boyhood hobbies were chemistry and electronics, he studied mathematics and physics at McGill University in Montreal, writing on the Nobel website: "I still much prefer to do science than to read about it." On a whim he applied to McGill's medical school and "rather to my horror I was accepted."

Becoming fascinated with the nervous system, he spent a few years during the Korean War in the neuropsychiatry division of the Walter Reed Army Institute of Research in Maryland.

In 1953, he married S. Ruth Izzard, whom he had met during a choir rehearsal at McGill.

"They were absolutely devoted to each other," Conway said, "and Ruth provided David with the kind of structure that is required in order to sustain essentially a lifetime of childlike curiosity."

Sacks said Dr. Hubel retained "the curiosity and wonder of a child all through his life. He was full of wanting to learn new things, try new things."

In 1958, Dr. Hubel moved to the Johns Hopkins Hospital laboratory of Stephen Kuffler, who became a key mentor, and began collaborating with Wiesel. The entire lab moved to Harvard Medical School the following year, and the collaboration between Wiesel and Dr. Hubel continued until Wiesel moved in 1983 to Rockefeller University.

"We had a great collaboration," Wiesel said. "We were exploring new territory in the brain that nobody before had investigated. For us, it was an adventure to try to understand how visual images are processed by the brain."

Dr. Hubel made a lot of the

equipment he and Wiesel used in their experiments, and he used some of those same skills to make furniture for his home, and weave rugs and scarves on a loom.

"I think that's part of his success in science. He always loved working with his hands," said his son Paul of Mountain View, Calif. "He was an amazing role model for myself and my brothers. He was obviously very dedicated to his work, but equally dedicated to his family."

Dr. Hubel played piano, recorder, and flute, keeping the later two instruments in his Harvard office in case anyone who dropped by who might want to play a duet. Fluent in French and German, he also presented a lecture in Japanese once while traveling in Japan.

His wife died in February at 83. In addition to their son Paul, Dr. Hubel leaves two other sons, Carl of Pittsburgh and Eric of Brooklyn, N.Y.; and four grandchildren.

A memorial service will be held at 2 p.m. Nov. 16 in Memorial Church in Harvard Yard.

The John Enders university professor of neurobiology emeritus at Harvard, Dr. Hubel also was a distinguished visiting fellow at Wellesley College. For the past five years, he taught a freshman seminar at Harvard, introducing the university's youngest students to suturing, soldering, or sometimes dissecting a mouse's heart.

Bringing students "from utter ignorance to deep insight" within the space of a single lecture, "David was one of the most charming and disarming teachers," Conway said. "He approached you and the classroom with a familiarity and a gentleness that invited you to learn what was going on."

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