

## NESACS Member Interviews

### Vivian Walworth



#### Vivian Walworth: An Interview

It is a hot July afternoon when I pull up to a red brick building in North Cambridge, which houses StereoJet, Incorporated. Upon entering the building, I find the president and chief technical officer of the start-up company, Vivian Walworth, running an experiment at the bench. Vivian, who will turn 90 next January, explained that the self-funded start-up company is making three-dimensional polarizing images with dichroic dyes. On that day, Vivian had been working on a “tricky solution” en route to the inkjet printing of a color image with these dyes.

Vivian’s interest in science started at a young age, when she was a student at Cass Technical High School in Detroit. This magnet school, which still exists today, places a strong emphasis on math and science education. At that school, Vivian first learned chemistry from a “marvelous chemistry teacher,” Evangeline Lodge Lindbergh, who had studied chemistry at the University of Michigan and was, incidentally, the mother of the famous Charles Lindbergh.

The high school had a Chemistry Club to encourage extra-curricular activities related to science. When Vivian found out that girls were not allowed to join the club, she formed her own Girls’ Science Club. The Girls’ Science Club enjoyed a variety of activities, including site tours of chemical manufacturing companies and a lab visit with the distinguished (and first female head of a division of the American

Chemical Society) Dr. Icie Macy Hoobler. Overall, the girls' club had a "much better program than the boys' chemistry club," said Vivian. "We were really something."

After high school Vivian continued her chemistry education at the University of Michigan, which she attended on a full-tuition scholarship. During her time there, Vivian worked for the noted analytical chemist Dr. H. H. Willard, doing both laboratory research and secretarial work. Additionally, the shortage of graduate researchers (due to World War II), gave Vivian the opportunity to work as an undergraduate laboratory instructor. At the end of her junior year she married Wilbur Walworth, who had just graduated with a degree in Electrical Engineering. He then took an engineering job at the Ritter Dental Company in Rochester, New York.

During her senior year, Vivian had an excellent on-campus interview with a visiting recruiter from Kodak. Following her graduation, she moved to Rochester and arrived at Kodak for a follow-up interview, only to be offered a secretarial job. "You must have an excellent vocabulary," she was told. In response, "I left in a huff," said Vivian. She then found a research lab job at a small photographic company, Defender, which later became part of DuPont. During Vivian's time at Defender, the company had two pay scales: one for men and one for women. At one point, Vivian found out that she was being paid a lower salary than the male dishwasher was paid. She promptly "went and made a complaint," until the salary discrepancy was corrected.

During the following year Wilbur completed an evening course in what was then called Ultrahigh Frequency Techniques, offered by the War Manpower Training Commission ("radar" then being a classified term). He then accepted a position as Radar Field Engineer with Submarine Signal Company in Boston and was soon assigned to the Philadelphia Navy Yard. Vivian worked for a year in a University of Pennsylvania biochemistry research lab engaged in an Air Force-sponsored study of brain metabolism at reduced oxygen levels.

In 1944, Vivian and her husband moved back to the Boston area, where Vivian obtained a job at Polaroid. Vivian's initial position was in Vectograph Research. The Vectograph process provided black-and-white three-dimensional polarized images that could be produced rapidly in the field, and these images were used extensively throughout World War II in support of aerial surveillance. Polaroid operated a school to train military technicians and supplied field kits that enabled them to produce stereoscopic images rapidly in the field for use in pilot briefing sessions. Within the Vectograph Research Laboratory, Vivian worked on a pilot training film that provided polarized target circles that could be displayed during training and turned off for pilot testing. She also participated in research on color Vectograph processes.

When Dr. Edwin Land introduced Polaroid one-step photography in 1947, Polaroid was relying on negative produced by Kodak and DuPont. The Vectograph group, including Vivian, undertook fabrication of Polaroid photographic emulsions. Throughout that time, Polaroid was "a very exciting place to be," said Vivian. For several years she served as Manager of both the Emulsion Research Laboratory and the Research Microscopy Laboratory. When she left Polaroid in 1985 she was Senior Manager of Photosensitive Materials Research.

Along with her research work at Polaroid, Vivian had the opportunity to co-author a chapter with Dr. Land on one-step photography, She also wrote several encyclopedia articles on the subject. Overall, Vivian authored and co-authored 28 patents and numerous publications based on Polaroid research.

For many of her years at Polaroid Vivian was active in the Society for Imaging Science and Technology (IS&T). She served as its president from 1981-1985, as editor of its Journal of Imaging Science (1989-91) and the successor Journal of Imaging Science and Technology (1992-1996). She also founded IS&T's bimonthly newsletter, the IS&T Reporter, and edited it for 22 years.

Vivian joined the American Chemical Society in January, 1942, and has been a member of NESACS since 1944. . She was recruited for the Board of Publications in 2005 by Nucleus Editor Arno Heyn, whom she had known well since their days together at the University of Michigan. During her tenure on the Board of Publications, Vivian successfully recruited Michael Filosa to serve as the editor of "The Nucleus," a job that he has held for 7 years. "We are very lucky to have Mike," Vivian said. "The Nucleus is considered the leading ACS Section publication."

The future of "The Nucleus" and the Board of Publications is likely to involve a steady increase in the importance of the website, which had just started to develop during the end of Arno Heyn's tenure. "I wouldn't be surprised if we stopped printing The Nucleus on paper within the next five years," said Vivian. "The website access is so much more timely."

Polaroid eventually filed for bankruptcy in 2001. Many of the former Polaroid scientists have stayed in the Boston area and are "doing wonderful things," said Vivian. As an example, all members of the staff of StereoJet, Inc., Vivian's start-up company, are former Polaroid employees.

The R&D being conducted at StereoJet, Inc. is an outgrowth of Polaroid research on color Vectographs. When inkjet printing was introduced in the 1980s, Vivian realized that the technology could be used to generate three-dimensional color images. Preliminary work at Polaroid indicated that this idea was feasible. Vivian worked for several years as consultant to a group at the Rowland Institute for

Science led by another former Polaroid employee, Jay Scarpetti, to develop and patent the first StereoJet process. This work was discontinued when the Rowland Institute merged with Harvard University in 2002. Vivian and others tried for some time to help Harvard license the process. Finally, “a group of Polaroid ‘alumni’ decided that we should be the ones to do it,” said Vivian, “and here we are.”

StereoJet, Inc. Corporation is currently self-funded. However, Vivian indicated that she does not find the financial situation unnerving. “In five years from now, we will either be dead or thriving,” said Vivian, but she is personally confident that the company will be successful. “No one is doing anything like this,” Vivian said. “I think we are going to make it.”

Interview by Mindy Levine Ph.D.