

Keynote Speaker

From weed killers and cannibals to viruses, prions, and Nobel prizes

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In 1939 two plant physiologists, Percy W. Zimmerman and Albert E. Hitchcock, working at the Boyce Thompson Institute for Plant Research in Yonkers, New York, discovered and patented in the United States the weed killing action of 2,4-D (dichlorophenoxy acetic acid). At the same time the Dupont Company in Wilmington, Delaware, applied and received the patent for 2,4-D for the whole world, except the United States. I wondered how the original discovery was made. Zimmerman told me that he tried numerous chemical compounds, the names of which he found in the Chemical Abstracts. There a dermatologist described how he used 2,4-D to cure athlete's food of a policeman. Although the chemical could be synthesized, Zimmerman was not a chemist and he needed help. A 16-year-old high school student was hired as a summer helper. After 8 weeks, the boy handed one gram of 2,4-D to Zimmerman and left. When the chemical was applied to broad-leafed plants, they grew rapidly, collapsed, and died. Thus the first weed killer was discovered. Since 1954 I tried to find who the bright summer helper was, but no records were kept of such temporary workers, who were paid 40 cents per hour. Zimmerman only remembered that the student was recommended by his aunt, an entomologist, who worked at the same institute in 1924-1926. It took me several years before I met Irene Dobroscky, who told me that her nephew, who helped Zimmerman, Daniel Carleton Gajdusek, became a world-famous virologist. When I met Gajdusek in 1970, I greeted him as "the discoverer of 2,4-D", but he thought that I confused him with someone else. When I reminded him of his summer job in Yonkers, he requested that I send him the names of the scientists who worked there in 1939. We became close friends. In 1976, Gajdusek received the Nobel Prize in Medicine and Physiology for discovering the infectious agent of kuru disease, that killed cannibals in the highlands of Papua New Guinea. In his Nobel lecture he described how he synthesized 2,4-D, the world's first weed killer. Gajdusek called the agent of kuru a "slow virus. It resembles the causative agents of Kreuzfeld-Jacob, scrapie of sheep, and mad cow diseases. In 1982 Stanley Prusiner, working with scrapie of sheep, detected no DNA or RNA in the scrapie pathogen, only novel proteinaceous infectious particles. He concluded that scrapie is caused by a self-duplicating, twisted protein and he coined the word "prion" for Gajdusek's "slow viruses". In 1996 Prusiner won the Wolf Prize, and the following year the Nobel Prize for his discovery of prions. Unknown to American scientists, a prominent Canadian biochemist, Juda Hirsch Quastel, also synthesized 2,4-D, working during World War II at the Rothamsted Experimental Station in Harpenden. The Agricultural Research Council of Great Britain requested him to find compounds that would stimulate plant growth. Quastel demonstrated the herbicidal properties of 2,4-D in agar tests and in the field. The findings were kept secret till the end of the war.

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