

A Celebration of the Life of Dr. Barbara McClintock

Renowned Geneticist Remembered at Memorial Service

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At a recent memorial service to celebrate the life of distinguished geneticist and Nobel laureate Dr. Barbara McClintock, friends and colleagues reminisced about her life and outstanding achievements.

Speakers at the service, held November 17 at Cold Spring Harbor Laboratory in New York, included Howard Green (Harvard Medical School), James Shapiro (University of Chicago), Evelyn Witkin (Rutgers University), V. Sundaresan (Cold Spring Harbor Laboratory), and Oliver Nelson (University of Wisconsin, Madison).

Recognition

Howard Green noted that McClintock's early achievements in maize cytogenetics brought considerable recognition, including election to the National Academy of Sciences (1944) and election to President of the Genetics Society of America (1945). However, McClintock's reports of transposable genetic elements were not readily accepted by her scientific peers until her genetic insights were verified by molecular biologists in the 1970's.

McClintock was recipient of several major awards, including the National Medal of Science (1970), Lasker Prize (1981), MacArthur Foundation Award (1981), and an

unshared Nobel Prize (1983). Green commented that McClintock bore these honors with a martyr's resignation, as she was well aware of the impact the attendant publicity would have on her solitary personal and scientific lifestyle.

Green said McClintock never considered science as a career--instead, she was a prototypic non-careerist. McClintock was interested in a variety of vocations. While working in Missouri, she spent many hours at the local weather bureau. She later indicated that if she had not entered science, she would have pursued meteorology. Green noted that McClintock did not believe that graduate students should be coddled. "Let them sink or swim!" was her motto.

Contributions

James Shapiro (University of Chicago) summarized McClintock's contributions in several areas. In the area of genome structure, McClintock likened the genome to a sophisticated erector set (although she had an intense dislike for models), whose activities were regulated by controlling elements (her term for transposable elements). Although she did not agree with certain evolutionary tenets, she believed that "any organism can make any other." One suspects that this view was sparked by observations of certain maize mutations (eg. Corngrass), which radically alter the plant's appearance. McClintock's view has been confirmed by recent findings of protein domains whose structure and function have been conserved among widely diverged organisms (eg. "Myb"-type DNA binding domains of transcriptional regulatory proteins in plants, animals, and fungi).

Shapiro also stated that in the area of cellular information processing, McClintock wondered how plant cells sense the presence of broken chromosomes and activate the appropriate repair mechanisms, and she marveled at the "smart cells" that underwent specific migrations in animal embryogenesis. McClintock was known to ask seminar speakers, "How does it all fit together?" She considered reductionism as an approach, not an answer. Shapiro believed that the secret of McClintock's success, in the face of incomprehension and prejudice, was her fearless and complete intellectual freedom--to

admit "I don't know," and then to wrestle the answer from the data.

Humor Noted

Evelyn Witkin (Rutgers University) treated the audience to a fresh look at McClintock's humor. After receiving the Nobel Prize, McClintock received an invitation from Henry Kissinger to a dinner for Nobel laureates. While the invitation listed all the other guests as "Dr. so and so," Barbara was referred to as "Ms. B. McClintock." McClintock penned in the margin a line from comedian Rodney Dangerfield: "I don't get no respect!"

Approachable

V. Sundaesan (Cold Spring Harbor Laboratory) spoke from the perspective of younger scientists who were receiving their Ph.D.'s when McClintock won the Nobel. Sundaesan noted that visitors to Cold Spring Harbor Laboratory regarded McClintock with awe, and wondered whether it was safe to approach her. In fact, McClintock would talk with anyone as long as they were sincere and not just there to say they had met her.

Sundaesan noted that discussions with McClintock were likely to take some time--if you asked her a question, you had better be prepared to confer for a whole afternoon. According to Sundaesan, after several hours of intense dialogue, she would look closely at you and say, "We'd better stop now--you look tired!" Several days or even weeks following a session with her, one might suddenly realize the significance of something she had said that, at the time, seemed incomprehensible or irrelevant. Sundaesan emphasized that although McClintock had the reputation of a mystic, she always drew her conclusions from her observations--this is what she meant when she admonished us to "listen to the plant."

Premier Cytogeneticist

Oliver Nelson (University of Wisconsin, Madison) observed much of McClintock's progress during his own lengthy career in maize genetics. Nelson noted that she was the nation's premier cytogeneticist, using the best organism--maize!

Nelson recalled how McClintock's first reports of transposable elements were often met with skepticism. However, Nelson's colleague and mentor, Alexander Brink, quickly recognized that McClintock's transposable elements could explain his own observations on variegated pericarp in maize. With her help, Brink and his student demonstrated that McClintock's Ac transposable element was involved in the classic pericarp variegation, which had been first studied by R.A. Emerson--the grandfather of maize genetics and McClintock's own supervisor while she was a graduate student at Cornell.

Nelson concluded by noting that researchers are occasionally presented with bizarre results. McClintock possessed a special talent to recognize the underlying order and provide an explanation for the most perplexing observations.

Following the scheduled speakers, Tom Brokaw, Jo Messing, and W. Szybalski added their own reminiscences. Far from a somber memorial service, this upbeat event brought McClintock's friends together to share their fond memories of an extraordinary colleague.