Book Reviews

Carlson, E. A.: Genes, Radiation and Society. The life and work of H. J. Muller. Ithaca, London: Cornell Univ. Press 1981. 458 pp., 54 figs. Hard bound $ 37.45.

This first biography of H. J. Muller (1890–1967) is more than the record of a remarkable life; it is a picture of an epoch of genetic science during the first half century of the blossoming of our knowledge of the hereditary mechanisms after the re-discovery of the Mendelian laws. It is a brilliant, well documented account in detail, based on unflagging research of the archives (the author read all 30,000 letters of Muller preserved in the Lilly Library at Indiana University) and on numerous interviews and conversations with admirers and detractors of the great geneticist that Muller without doubt was. Each little thing is supported by proofs in the footnotes, which sometimes in themselves are most interesting to read. It is quite clear that the author, himself a student of Muller, assisted by Thea Muller, who contributed numerous recollections, tries to draw not the picture of an hero, but of a dedicated man, who overtopped many of his contemporary fellow geneticists. But Muller was not only an excellent experimentator who handled *Drosophila* with extreme skill, but also a theoretician who participated in a continuous process of interpretations and re-interpretations. His contribution especially in radiation genetics was honored by the Nobel Prize for Physiology and Medicine for the year 1946. Suddenly the investigator, who had struggled for temporary positions and grants for more than 30 years, got the recognition he deserved.

Coming from the Morgan school he was really a ferment of ideas, as expressed by the author in a chapter title. Because of that he discovered the mutagenic effect of x-rays in 1926. This was not a lucky discovery, but a step in a series of deliberately planned experiments into the problems of mutations and the genes. But Muller was optimistic that the application of x-rays would open a whole new field of genetic research. It was his conviction that for the first time he had willfully changed the hereditary material and that evolution could then be speeded up. In spite of many a doubt, within a year Muller's claim of the mutagenic effect of x-rays had been confirmed, whereas the mutagenicity of UV radiation was technically more difficult to prove. Characteristic of the broad mind of Muller is the fact that once he recognized the powerful mutagenic efficiency of x-rays he saw immediately its dangers for humanity. Therefore, part of his life he spent in drawing attention to radiation danger. His involvement in the fallout controversy was part of his social dedication, which led to his struggle for peace and freedom.

Muller's controversial position is to a grreat extent a consequence of his early marxistic ideology. This brought him into open sympathy for the Soviet Union and the communistic experiment in Russia, intermixed with so called progressive ideas in eugenics. He believed that science in general and genetics in particular could be applied beneficially for mankind if a prevalent idealism and an effective educational reform could make science part of the human outlook. In consequence he left the United States in 1932 and migrated via Germany to Leningrad, later on to Moscow, greatly supported and stimulated by N. I. Vavilov. The turbulent years in Moscow ended in fiasco, with Stalin's protection of the Lysenko-propagated Lysenkoism. Vavilov went to jail. And Muller escaped to Edinburgh, totally disillusioned and frustrated. He left the temporary haven in Scotland on the brink of war for Amherst, and found a final home at the Indiana University in the Zoology Department. Shortly after Thomas Hunt Morgan's death, Muller got the Nobel prize, so that his position was fixed. In 1948 Muller resigned from the Soviet Academy of Sciences, at the same time a protest against Lysenko's triumph and the expulsion of his fellow geneticists Orbeli, Schmalhausen, Dubinin, the death of Vavilov, the imprisonment and disappearance of many others. To Muller, party-protected Lysenkoism was not a scientific movement but a fraudulent pseudoscience, and in his mind the only effective way to fight it was to describe it as it was rather than to pretend it was a conflict between the chromosome theory and neo-Lamarkianism. Nowadays in the USSR Lysenkoism is also considered a deviation from a rational approach and a consequence of a cult of personality, which they would prefer to forgot. Muller himself was rescued by a personal humanism; though he disliked philosophy, he was very familiar with it.

At the end of his life he was confronted with the rise of a new genetics, resulting from molecular biology. Muller major contribution retained its value: his recognition that genes reproduced their variations. The process of mutation alters the function of a gene, but not its capacity to replicate. His discovery of the mechanism of dosage compensation provide insights into genetic regulation. In human genetics Muller contributed the concept of genetic load. His greatest achievement remains however the design of the experiment that proved the induction of mutations by radiation. This finding has had a tremendous impact on mutation breeding. The present biography is a balanced report of a life, full of performances, full of fighting, but also full of dedication to human values. But it also shows the detours of an idealist, who despite his failures in over-idealizing the socialistic achievements maintained his optimistic view in humanity's capacity for change through education and the spread of rationalism. Everybody who is interested in the history of genetics should read this book.

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