

## Obituary

Norman H. Giles (1915-2006)

Norman H. Giles, 91, died on Oct. 16, 2006 at the Dartmouth-Hitchcock Medical Center from complication relating to a fall. He had recently moved from his home in Athens, GA to Norwich, VT to live with his daughter Annette Brown and her husband Arnie. He was born in Atlanta on August 6, 1915. He obtained his undergraduate degree from Emory University in 1937 and his Ph D degree from Harvard University in 1940. He married Dorothy Lunsford in 1939; she died in 1967. He subsequently married Doris Vos in 1969. He began his academic career in Botany at Yale University in 1941 and was appointed Eugene Higgins Professor of Genetics in 1961. He interrupted his time at Yale to work as principal biologist for three years at Oak Ridge National Laboratory from 1947-1950. He was elected to the National Academy of Sciences in 1966.

Norman Giles was recognized as a pioneer in the fields of radiation cytology and genetics. His early works from 1939-1955 dealt with microsporogenesis and chromosome aberration studies in *Tradescantia*. This work was initiated at Harvard University and continued at Oak Ridge National Laboratory and at Yale University.

In the mid 1940's, his first studies with *Neurospora crassa* involved a reversion analysis of inositol mutants. This work followed the studies of Beadle and Tatum who dealt with reversion of nutritional mutants. In the early 1950's, Norman became interested in the induction of mutations by UV and X-rays and in determining the nature of mutations blocking various biochemical pathways, e.g. pantothenic acid, adenine, methionine, histidine and aromatic biosynthesis. Subsequently, a number of important papers followed including intragenic complementation, gene conversion and an analysis of gene clusters. For example, complementation analysis of purple adenine mutants by Fred de Serres, Norman's first graduate student, indicated that these mutants could be separated into two closely linked loci, *ad-3A* and *ad-3B*. Studies of allelic recombination at the *pan-2* locus by Mary Case showed that gene conversion could occur at several different sites in one locus. Studies by Norma Nelson, Dow Woodward and C. W. H Partridge provided the first evidence for "allelic complementation" maps *in vivo* and complementation *in vitro* at the *ad-4* locus.

Extensive genetic and biochemical studies involved the *arom* mutants, a complex of five enzymes in the polyaromatic biosynthetic pathway. Later studies by others showed that the *arom* region encoded a dimer composed of two pentafunctional polypeptide chains. In studies of *arom* mutants, the absence of one class of mutants in the gene encoding biosynthetic dehydroquinase was missing. Further studies of *arom* mutations led to the discovery of two genes encoding the same enzymatic reaction, dehydroquinase, one in the *arom* cluster and the other in the inducible *qa* pathway.

In 1972, Norman moved to the University of Georgia to become the Fuller E. Callaway Professor of Genetics. At Georgia, further studies of the genes in the tightly linked *qa* cluster made significant contributions to our understanding of the control at the molecular level of regulation of biochemical pathways in microorganisms. The *qa* gene cluster was shown to consist of five functional genes and two regulatory genes, one positive and one negative, which regulate the expression of the functional genes. The *qa* genes are induced when *N. crassa* is grown on quinic acid and are coordinately regulated by the positive and negative regulatory genes, *qa-1F* and *qa-1S*, respectively. These studies involved a detailed analysis of the *qa* cluster, eventually leading to the cloning and sequencing of the entire cluster. These studies provided the first evidence of expression of eukaryotic genes in *Escherichia coli* and also provided the first evidence for transformation in *N. crassa*.

A born naturalist, Norman had a life long interest in birds, flowers and trees. At the age of eleven Norman and a friend started a quarterly devoted to ornithology in Georgia-The Oriole. He was a charter member of the Georgia Ornithological Society (GOS) founded in 1936. Through out his travels to scientific meetings, he always followed his interest in birds. Never without binoculars, he was an inveterate birdwatcher. On his retirement in 1986, he continued his travels around the world, eventually visiting over 60 countries on all seven continents, traveling around the world five times.

On one of these later trips, Norman was not devoted entirely to bird-watching. On a visit to China in 1979, Norman was able to bring out a collection of *Neurospora* strains which had been collected through out China by T. C. Sheng and other Chinese geneticists. In later trips, Norman collected *Neurospora* samples from the Caribbean, South America, and the Pacific Islands. These collections are now in the Fungal Genetics Stock Center.

His wife Doris preceded him in 2004. Other surviving family members include his son David Giles of Jacksonville, FL, a step-daughter Alix Weaver of Northbridge, MA and a grandson Dylan Brown.

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