

## IN MEMORIAM: FRANK W. PRESTON

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FRANK W. PRESTON, 1896–1989  
(From a photograph taken in ca. 1965)

Frank W. Preston was born on 14 May 1896 in Leicester, England, and died on 1 March 1989 in Butler, Pennsylvania, after suffering a general decline in health for more than a year. He is survived by his wife Jane Hupman Preston. They had no children. He is survived also by a half-brother Eric J. Preston in England.

*The ornithologist.*—It is customary in biographies of scientists to recount their virtues, but seldom to say they were intelligent. Frank Preston was intelligent. He brought a penetrating intellect to bear on every subject he touched,

even peripheral interests, of which ornithology was one. He illuminated whatever he touched. In a world where most people, including scientists, are merely competent, he was an authentic genius, by any definition of the term.

He did not consider himself an ornithologist, although he joined the American Ornithologists' Union in 1952, was named an Elective Member in 1956, and a Fellow in 1971. Certainly he was not a birder, although he thoroughly enjoyed walks afield, especially with expert companions. Imperfect vision and loss of hear-

ing in one ear handicapped him in finding birds and identifying them. His myopia was corrected by eyeglasses, but he was color-blind. These defects kept him out of military service in World War I in England. His imagination was captured not just by seeing birds but by solving problems.

Like most natural scientists, he showed this interest early in life. As a boy, he explored the English countryside by foot and bicycle. He collected eggs and learned to preserve bird skins. His broad interest in nature persisted through life, and his attention to birds deepened in later years.

His more important studies always reflected his mathematical bent. His boyhood interest in eggshells re-emerged later in life when he addressed the exact description of birds' eggs, their shapes, measurements, and pigmentation. This topic resulted in a series of papers between 1953 and 1974, and it led him to finance the measurements of thousands of eggs in museum collections for the "Handbook of North American Birds" by Ralph S. Palmer, including material for volumes not yet published. Several of his papers on this subject, but not all, were published in *The Auk*.

Statistical topics that attracted him for many years were various aspects of sampling and extrapolation to generalizations about populations. He pointed out a consistent relationship between the commonness and rarity of individuals and species in many forms of life, which was best represented by a lognormal curve rather than the familiar normal-distribution (Gaussian) curve. His examples were drawn frequently from ornithology, but his work on this topic more often appeared in *Ecology* between 1948 and 1981.

He took a mathematician's view of the heights of birds' nests, showing that nests in deciduous woodland and brushlands were most numerous on or near the ground, and they declined steadily with height (1947, *Ecology* 28: 241). He analyzed the distribution of migratory movements by dates (1966, *Ecology* 47: 375). Simple questions received his penetrating scrutiny, like the probability birds will be seen by one or more observers in a census tract.

One problem that captured his attention for years was the possibility that long-distance night migrants over water were aided by rising cells of warmer air. He completed a long speculative paper on this topic in 1973, but it was never

published. Since he often approached topics from such a new and unusual angle, it was not easy for editors to find referees with the knowledge to deal with his ideas.

His residence and place of business at the Preston Laboratories was located on a wooded estate of 90 acres, with a stream dammed to form two ponds. This nature sanctuary was the site of many of his field observations. For a time in the 1940s he employed an ornithologist, Russell T. Norris, justifying this addition to the staff by the cross-fertilization of ideas in a group of physicists, chemists, and engineers.

He told me that when he went into a factory to deal with a technical problem, he started with the assumption that multiple causes were at work. If there had been only one cause, the practical men on the scene would have solved it. How like biology, I thought.

Some of his minor observations on birds were issued in typewritten form by the Meridian Research Center, another name for his own establishment. His ornithological papers appeared mainly in *The Auk*, *Wilson Bulletin*, *Condor*, *Nature*, and *Annals of the Carnegie Museum*. No complete bibliography of his works has been published.

Although this was only one aspect of his life, ornithologists should be proud to call him one of them.

*The glass technologist.*—Although people in several disciplines claimed Frank Preston, he regarded himself primarily as a glass technologist. This was his principal occupation. Early in life he decided to make his living where he could deal, in his words, "with things rather than people." His father, not well educated himself, was a thwarted scholar and he encouraged Frank in his studies, especially after he won a scholarship to secondary school and qualified by competitive examination to enter Oxford. However, he was financially unable to attend Oxford and left formal schooling at age 16. Nevertheless, by examination and published works alone, without attending classes, he was granted a B.Sc. in civil engineering in 1916 (at age 20 with first class honors), Ph.D. in 1925, and D.Sc. in 1951, all from London University.

In World War I he was drawn into the optical glass industry by his country's desperate need for lenses used in aerial photography. This experience caused him to come to America after the War as a consultant on the forming and

polishing of glass. After several trips to this country, he settled here permanently, first employed by a plate glass company and then forming his own firm for consulting and supplying test equipment to the glass industry. His ideas supported a staff of professionals.

His creativity was attested by scores of patents, including a revolutionary advance in the melting of glass by electricity. He was an authority on the propagation of cracks in glass and the diagnosis of causes of breakage. As such, he was called frequently as an expert witness in lawsuits. As a consultant, his forte was solving problems that individual manufacturers could not handle, and this spurred him to continued research on glass and testing equipment. His technical papers poured out in an uninterrupted stream for six decades. His early papers were published in England, but his later works were published mainly in *Glass Industry*, *Journal of the American Ceramic Society*, and the *Bulletin of the American Ceramic Society*.

Because of his professional reputation, he was invited to be an official observer at the atomic bomb test at Bikini Atoll in 1946.

He received many honors from scientific groups, but none seemed to delight him more than being named hereditary Freeman of the City of Leicester in 1987, the only person to have been so honored in absentia.

After his retirement he turned over the Preston Laboratories to his staff, and they carried on at a new site a mile away as American Glass Research, Inc.

*The ecologist.*—In a sense, Frank started out in ecology. As a child he was fascinated by the relationships among living things. He raised flowers, butterflies, and moths. In one year at Butler he trapped 300,000 moths and gave them to the Carnegie Museum in Pittsburgh. At Leicester he had been the youngest member of the geological society, and in his mature years he spent much effort in unraveling the glacial history of his locality. He not only wrote about it but he worked to create Lake Arthur and Moraine State Park, partly through the donation of his own land. He also played an important role in preserving McConnell's Mill State Park. He was one of the founders of the Western Pennsylvania Conservancy.

He applied his experience in the melting of glass to explaining the behavior of molten rock in the interior of the earth and its upward drilling under volcanoes.

He traveled extensively, but never as a mere tourist. From each trip he brought back an account of those places that was encyclopedic. In 1925 he traveled around the world, stopping in South, Central, and East Africa, Australia, and New Zealand. His several months in Africa provided grist for thought the rest of his life. His experiences in Africa as hunter and observer were printed as letters to the Butler newspaper. A cruise up the Amazon by freighter in 1961 brought specimens, including a new subspecies of butterfly, to the Carnegie Museum. Several weeks in Costa Rica in 1962 gave valuable impressions of the rapidly disappearing dry lowland forest. These travels brought him friends around the world, with whom he continued correspondence.

*The person.*—Personally Frank Preston was tall, slender, and dignified. His manner was reserved, but he possessed a whimsical sense of humor and an original point of view that made him an engaging though reluctant lecturer. He related a trip to Britain to nature societies mainly by singing Middle English ditties about birds. Once, in introducing a visitor from South Africa to a scientific gathering, he gave part of his message in Swahili. He lightened his scientific papers and perhaps distressed the editors by amusing titles and allusions drawn from sources far from science.

Although he did not have much regard for the opinions of ordinary citizens, he was unfailingly courteous, holding his opinions for a suitable audience. He was kindly in the extreme, and generous with his time and money to worthwhile causes. He assisted many institutions and societies, including the AOU, in ways mostly unrecorded. Having lived alone as a bachelor until middle life, he filled solitary evening hours by reading. Possessing a retentive memory, he often amazed his scientific friends with the extent and detailed accuracy of his knowledge. Among his surprising skills was marksmanship with shotgun and rifle. Also he possessed considerable linguistic skill. He learned classical Latin and Greek in boyhood, and eventually acquired a working knowledge of Spanish, French, and German. He was both a doer and a thinker. For diversion he took up the flute, but he did not just tootle; he formed an orchestra.

His curiosity was boundless, and once attracted to a subject, he pursued it imaginatively and tenaciously for years if necessary. His compul-

sion to find answers to questions and to stay abreast of the relevant literature did not leave much room for trivia. He avoided modern fiction, but he loved poetry and quoted it at length. He had no use for television and he did not read any newspaper regularly. Problem solving

was so exciting that he could not be happy wasting time.

I am grateful for the help of two of his closest friends, John M. McCormick and Daniel R. Pfoutz, who gathered facts for this memorial.