

EUGENE G. MUNROE: THE LEPIDOPTERIST, 1919-2008

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In 2004, Eugene G. Munroe received the Karl Jordan medal from the Lepidopterists' Society. He was unable to attend, but he sent a videotaped message to the society as Karl Jordan had done in 1956 to the 10th International Congress of Entomology in Canada. In the video, Gene spoke about meeting Karl Jordan at the Natural History Museum at Tring, England, when he was just 17; Gene was probably one of the last living lepidopterists in 2004 to have spoken with Jordan. He talked at length about Jordan's accomplishments regarding the concept of geographical subspecies, which reduced the number of butterfly names, and of his founding of the International Congress of Entomology. This address to the Lepidopterists' Society via video spoke volumes about Gene's modesty and his preference to praise the work of others and/or talk about moths and butterflies. He had a great sense of humor that made working with him a great joy. Ron Hodges told me a story about Gene cracking jokes in Latin that had Ron and Jack Franclemont in stitches. On a working trip to his home in 1988 (to make progress on the checklist of neotropical Chrysauginae with Vitor Becker) we worked long hours, but after dinner there would be lively discussions about lepidopterology. Eric Classey was also visiting at the time. One night around 11 pm the discussion became so loud and boisterous that his wife, Isobel, came down and announced that she was putting away the wine because we had much work to do the next day! Many who knew him have similar stories about Gene, for example, Bernard Landry's amusing story about Gene at a social event [Solis, M. A. 2000. *Tropical Lepidoptera*, 11:1-6]. Recently Jay Shaffer and I recounted a few humorous items about Gene in the *Pyriloid Planet* newsletter [2:2].



In 2000, I wrote a detailed account of Gene's life and professional career for a festschrift in *Tropical Lepidoptera* [11:1-6], so this obituary is an attempt to provide insight into Gene's personality and enthusiasm for research. Gene Munroe received his BSc in 1940 and a MSc in Entomology in 1941 from McGill University. In 1948 he received his PhD from Cornell University for his work on the biogeography of West Indian butterflies. Among ecologists, Gene is best known for his dissertation work, which focused on distribution patterns of Lepidoptera on island systems (e.g., Munroe 1948, 1953). In 1989, Brown and Lomolino [*Ecology*, 70: 1054-1957] wrote a note entitled "Independent Discovery of the Equilibrium Theory of Island Biogeography." They asserted that Gene independently discovered this theory and published it in his doctoral dissertation (1948) 15 years prior to MacArthur & Wilson [1963. *Evolution*, 17: 373-387; *The Theory of Island Biogeography*. Princeton University Press]. In evolutionary ecology this is one of few theories that withstood scrutiny and skepticism. Brown and Lomolino (ibid.) were curious to learn why Munroe's discovery was not recognized. In a letter to James Brown dated February 16, 1988, Gene wrote: "*Having competing interests and pressures I didn't write either [1948, dissertation and 1953e, abstract] of these up, the second led to an invitation from Bob Usinger to spend the winter term of 1959-60 at Berkeley leading a seminar in biogeography, in which my ideas were developed and exposed to graduate students. He encouraged me to write a book on biogeography, but I found difficulty in getting it together in the months that I was there.*"

Brown and Lomolino (ibid.) pointed out an important lesson for scientists: "*It is not sufficient to have a good idea, it is even more important to develop and publicize it.*" In 1993, Wilkinson [*Global Ecology and Biogeography Letters*, 3: 65-66] wrote with reference to Munroe's work: "In promoting a

new theory it may be important to stress the theoretical importance of the work in the title of the publication.” But it was not all Gene’s doing, Brown and Lomolino (ibid.) point out that in the 1940’s “Biogeography was dominated by descriptive and taxonomic approaches.” Also, by the 1960’s ecologists were “more receptive to mathematical models,” but such ideas require publication in a seminal paper, followed up rapidly with a more in-depth publication, and mathematical models should be accompanied by graphics so that an audience with minimal mathematical skills can grasp the concept. Despite the fact the Munroe received little recognition for his discovery, he continued to conduct biogeographic studies in insects. In 1957d he wrote a paper in *Science* about the comparison of closely related faunas, and in 1958 he wrote a paper entitled “*The Geographic Distribution of the Scopariinae*” in which he recognized that this species-rich group was morphologically conservative and characterized by endemic groups on island systems. He later wrote a chapter on insect zoogeography for the *Annual Review of Entomology* (Munroe 1965) and a chapter on the biogeography of insects (Peck and Munroe 1999). Scott Miller (pers. comm.) recently pointed out that Gene’s paper about distribution patterns of Lepidoptera in the Pacific (Munroe 1996) demonstrates that he had a much greater knowledge of the biogeography of Lepidoptera in New Guinea, Micronesia, and the Pacific Islands than was ever published.

After finishing his PhD, Gene was hired as a Research Scientist in the Systematics Unit, later the Biosystematics Research Institute, of the Canada Department of Agriculture (now Agriculture and Agri-Food Canada) in 1950 (he retired in 1979). On February 9, 1951 Gene wrote to Hahn W. Capps, [USDA, curator of the Pyraloidea at the NMNH in Washington, D.C.): “*When I finished my graduate work (on West Indian butterflies) in 1946, I was anxious to select some group of moths on which to work, as I felt that this would be both a more productive field and one more easily handled from the mechanical standpoint by a private worker than would almost any group of butterflies. ...It was obvious that the Pyralids, and particularly the Pyraustine end of the group were in need of the most fundamental reclassification; they also struck me as attractive insects to work on, and accordingly, after having sought the advice of Dr. Forbes and Mr. Franclemont, I decided to specialize in the family.*”

This did not sit well with Capps, and clouds gathered. On December 5, 1952 C.F. Muesebeck (USDA, Division of Insect Detection and Identification) wrote to G.P. Holland (Division of Entomology, Dept. of Agriculture, Canada): “Capps was working on the Pyraustinae long before Munroe started, but he generously offered to give up his studies on the Nearctic forms in favor of Munroe and to confine himself to the tropical fauna. Now, however, it appears that Munroe is simply taking over the whole field....” On February 9, 1951, Munroe had written to Capps: “*...Nor do I think that a faunistic division (for instance, North vs. South America) is likely to be the best in practice. The material that I have examined suggests very strongly, however, that the Pyraustinae as conventionally understood will split into at least four major groups...*” [Munroe suggested Capps work on the first group]. “*As you know, there is a strong tradition here [Canada Agriculture] of work concentrated on the North American fauna. I have always felt that this will have to be revised as a long-term policy, for obvious reason that no stable classification, even at the species level, can be erected on so rigidly defined a faunistic base.*” In further correspondence with Capps, Gene appeared to retreat to work on the *Palpita illibalis* group (Gene’s group #4 above). Gene rapidly grasped that many groups in the Pyraloidea were not natural groups and that a worldwide study of this group was absolutely necessary. Considering the size in sheer number and diversity of the Pyraloidea, I am puzzled that the few workers in the world at the time would converge on the Pyraustinae,

On February 9, 1951, Munroe wrote to Capps: “*I strongly feel that at least the types of named Old World genera ought to be studied as fully as possible, ...either in conjunction with or as a supplement to the New World revision.*” Gene was ahead of his time with regards to type-imaging, although the technology wasn’t quite yet available to him and his colleagues who also felt this was extremely important to the field of systematics. Gene was the first to photograph type specimens of

Pyraloidea from diverse museums worldwide and this allowed him to sort and place species correctly and ultimately allow him to develop more natural generic concepts. Early on the photographs were in black and white and often times they were of entire drawers of types. In 1953, Gene was a founding member of a "type-figuring subsection" committee at the meeting of the International Union of Biological Sciences held in Nice. Later [see 1955c], he described the function of this committee and offered for sale the first 50 photos of type specimens at the Canadian National Collection [there was no internet for type specimen websites!].

Gene Munroe was the acknowledged authority on the Pyraloidea worldwide for many years. For nearly three decades, he was one of the few people publishing in the Pyraloidea. Gene's contribution to the systematic knowledge of Pyraloidea includes over 170 research papers and to this day is unparalleled. His work was diverse, including type specimen catalogs and designations, faunistic and revisionary works, and new species descriptions. His faunistic work was global in scope. He wrote a series of 12 papers entitled "*Contributions to a study of the Pyraustinae [now Spilomelinae and Pyraustinae] of temperate East Asia*" from 1968 to 1970 with A. Mutuura. His early work in the Pyraloidea focused primarily on solving taxonomic problems in North American genera and included many papers on Neotropical crambid genera too diverse to list here. Later he wrote comprehensive papers on the Odontiinae, Glaphyriinae, and Midilinae. For the Moths of America North of Mexico [now Moths of North America] (MONA) series he completed 5 fascicles in the Crambidae between 1972 and 1976, including the Pyraustini [now Pyraustinae], Scopariinae, Nymphulinae [=Acentropinae, and now in addition, the Musotiminae], Odontiinae, Glaphyriinae, and Evergestinae.

One of Gene's greatest contributions was that he placed taxa in the correct subfamily, for example, his early paper on Hampson's Schoenobiinae (Munroe 1958). He once said that when he first started working in the Pyraloidea he would read the descriptions and realize that many of the generic concepts of Hampson and Meyrick did not make sense. At first he was uncertain about how to solve these problems, but he eventually realized that species catalogs would be the best venue. This is reflected in two very significant catalogs that include the Pyraloidea of the Western Hemisphere: *Check List of the Lepidoptera of America North of Mexico* (MONA) (Munroe 1983), and *Atlas of Neotropical Lepidoptera, Checklist: Part 2, Hyblaeoidea - Pyraloidea - Tortricoidea* (Munroe 1995). The latter catalog is a monumental work that included many new combinations and synonymies, with over 200 notes that explained the changes. A smaller but equally significant contribution (Munroe 1989) detailed the changes in the classification and names of the Hawaiian fauna, where Gene used the two family designations, Crambidae and Pyralidae, for the first time since its proposal by Minet [1982, Les Pyraloidea et leurs principales division systématiques, Bull. Soc. Ent. Fr. 86: 262-180]. Gene summarized his broad knowledge about Crambidae in a chapter on the Pyraloidea with M.A. Solis (Munroe and Solis 1999) for the *Handbook of Zoology*. His final work, published in 2007 with Jay Shaffer, was the "*Crambidae of Aldabra Atoll*," a small island in the Indian Ocean.

Gene was awarded the Queen's Jubilee Silver Medal by the Canadian Government in 1968 for his service as Principal Science Advisor and Head of Studies in the Science Secretariat, Privy Council Office. Gene participated in a broad array of the activities of numerous scientific societies. He served as a Member of the International Commission on Zoological Nomenclature from June 1961 to March 1975. He was a Fellow of the Royal Society of Canada, Emeritus Member of the Entomological Society of America, member of Sigma Xi and the Entomological Society of Washington. He was Honorary Member of the Ottawa Field-Naturalists' Club in recognition of outstanding contributions to Canadian Natural History or to the successful operation of the club. He was an Honorary Member of the Entomological Society of Canada, President from 1963-64, Editor of The Canadian Entomologist from 1958- 1961, and awarded the society's Gold Medal in 1982. He was a Charter and Honorary Life Member of the Lepidopterists' Society and its President in 1958.

Gene was Editor-in-Chief of the *Moths of America North of Mexico* (MONA) from 1976 to 1982. Gene was Managing Director of the Wedge Entomological Research Foundation from 1974 to 1984,

and remained on the Board of Directors until 2000. He was also a Charter Member and served on the Board of Directors of the Association for Tropical Lepidoptera. In 1998, Gene received the Jacob Hübner Award, "In Recognition of Significant Contributions for the Advancement of Systematics of Lepidoptera," from the Association for Tropical Lepidoptera. In 2004, Gene received the Karl Jordan medal from The Lepidopterists' Society. Gene Munroe passed away May 31, 2008 at the age of 89 in Ontario, Canada.

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