

A history and update of the Kenelm W. Philip Collection, currently housed at the University of Alaska Museum

by *K. M. Daly*¹

Introduction

Dr. Kenelm W. Philip, founder of the Alaska Lepidoptera Survey, was the owner of the largest private Arctic Lepidoptera collection in the world with over 111,000 individual specimens. I have had the honor of caring for his collection since Dr. Philip's sudden death two years ago, and felt it time to share a brief history along with an update on work that has occurred since the collection arrived at the University of Alaska Museum (UAM). Dr. Ken Philip died in March of 2014 at the age of 82, after calling Fairbanks, Alaska home since October of 1965. He came to Fairbanks to work as a professor of physics with the Geophysical Institute, having previously worked as a research staff astronomer at the Yale University Observatory in New Haven, Connecticut. He began collecting and studying Lepidoptera as a child; though he never formally taught entomology in a classroom he inspired hundreds of people to take interest in these animals through his genuine enthusiasm for knowledge.

Citizen science: the Alaska Lepidoptera Survey

Specimens were acquired across eastern Russia, Alaska and western Canada through the help of over 600 volunteers of the Alaska Lepidoptera Survey. Dr. Philip prepared and mailed collecting equipment free of charge to anyone who was willing to capture butterflies and moths on his behalf. Many volunteers were researchers headed to remote areas of the state for field projects, but anyone who expressed interest was supplied with a collecting kit. Housewives and children who caught specimens in backyards and even pipeline workers who were stationed at camps along the Dalton Highway were involved, along with National Park Service employees who obtained permits to collect for Dr. Philip. He stored the entirety of his collection, what I've counted to be over 127,000 specimens, in a private custom laboratory he had built in his home in Fairbanks.

Support and scientific appointments

Spread specimens were protected through storage in cabinets provided by the Smithsonian Institution, who supported this effort with needed supplies to curate the col-

lection. Dr. Philip became a research associate of both the Smithsonian and the University of Alaska Museum in 1971, and from 1985 he also maintained an appointment as a research scientist for the Institute of Arctic Biology at the University of Alaska Fairbanks. Alaska's National Park Service supported Dr. Philip through issuing permits for both himself and interested volunteers to collect within Park boundaries beginning in the late 1960's. He made dear friends from Toolik Field Station on the North Slope of Alaska to Kluane Lake Field Station in the Yukon Territory and everywhere between; his mission to document Lepidoptera fauna led him across Alaska and western Canada for almost 50 years, along with four trips he took to collect specimens around eastern Russia.

Dr. Philip served as Vice President of the Lepidopterists Society for six years. He also served on their Executive Council and Editorial Committee, and for decades he prepared the annual Season Summary of Lepidoptera activity in Alaska and western Canada as the Zone Coordinator of the Far North region each year. In these positions, Dr. Philip maintained professional correspondence with researchers across the globe. He was truly a phenomenal scientist because he treated new students of Lepidoptera with the same respect and encouragement for our shared joy of knowledge.

2011: My first Alaska summer

I had the pleasure of corresponding with Dr. Philip beginning in 2011, when he received and identified my photographs of caterpillars and butterflies from Toolik Field Station on the North Slope. I traveled to Alaska for my first time to spend that summer at the field station as an undergraduate student. I wanted to learn about the caterpillars that were prevalent within an established snowmelt experiment run by Dr. Heidi Steltzer, my biology undergraduate advisor at Fort Lewis College in Durango, Colorado. I initially sent my photos to Dr. Derek Sikes at the University of Alaska Museum, who then shared them with Dr. Philip. He kindly encouraged me to keep sending him whatever photos I could capture, and shared his own photos of live and pinned specimens. Dr. Philip had initially planned to come to Toolik that summer, but weather patterns led him to travel down the Dempster Highway instead so I didn't get a chance to meet him in person before I left back to Colorado. I was disappointed, for everyone who had met him

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at Toolik had told me what a congenial and knowledgeable person he was.

2013: return to Alaska forever

I knew Alaska was where I wanted to be, and was fascinated by what Dr. Philip had shared with me about the Lepidoptera of the North Slope. In 2013, I was ecstatic when I was offered a chance to return again to Toolik for another summer. This time, I was a field technician for PhD entomology student Ashley Asmus. I loved sharing butterfly images again with Dr. Philip in my free time. At the end of that summer, he invited me to visit the collection any time I had the chance. I was thrilled to have the opportunity and when I was offered a temporary research assistant job at UAF that fall, it seemed my destiny to move to Fairbanks. I couldn't wait to meet Dr. Philip in person; his humble and friendly demeanor made viewing his magnificent collection all the more astounding to me.

I also took my first tour of the University of Alaska Museum in September of 2013, where Dr. Sikes offered me Lepidoptera specimens to take to Dr. Philip. That winter, I learned how to prepare and spread the specimens, and to take the time that Dr. Philip did to straighten each head and curve antennae into the most natural bend. His mastery of this art was but one part of his life where he excelled; aside from his career as an astronomer & physicist, he also studied fractals of the Mandelbrot equation and created a range mapping software program (one of the first of its kind) that sold globally. He seemingly had a photographic memory for knowledge and could summon any bit of information with a smile, along with a relevant quote or pun as he saw fit. His willingness to welcome me into his life that winter to patiently teach me about Arctic Lepidoptera was a tremendous gift. He was one of the most remarkable people I have ever had the pleasure of knowing. Many people have shared the same thought with me since his passing. He clearly impacted thousands of people through his diverse interests and efforts.

March 2014

When he died suddenly in March of 2014, Dr. Philip left behind legacies in both science and the arts; his immense collection of classical music was donated to KUAC radio station and his donated book collection quadrupled the inventory of the Literacy Council of Alaska. His Lepidoptera collection is a priceless resource that will certainly influence generations of future research. The majority of the collection was willed to the Smithsonian, with the remainder to be split with the University of Alaska Museum.

The entire collection is currently still at UAM but it is likely the split will begin in 2017. The National Park Service, who supported Dr. Philip's work over the years, recognized the immediate need to tend to the collection after his sudden death. They provided funding for one year of work to inventory it and to database specimens that he collected within Alaskas National Parks. As Dr. Philip's last student, I was offered this position by Dr. Sikes and officially began that work in June of 2014. However, it was immediately critical to secure the collection for transfer to the University of Alaska Museum directly after Dr. Philip's death.

We opened almost 500 drawers to push down every specimen pin to ensure they were safe for transport. The drawers were laid carefully into low stacks in the back of a Uhaul truck, using plenty of blankets for packing. Drawers and boxes lined the back hallway of the museum as we packed away shelf after shelf of Dr. Philip's laboratory. The smell of naphthalene was so powerful that museum employees went home ill, and the Children's Museum (which is no longer at UAM) closed for two days!

The drawers and also boxes containing paperwork, correspondence and specimens lined the entire hallway, stacked shoulder high in some places. Miscellaneous containers of all shapes and sizes were found to be filled with specimens sent in by collectors. Dr. Philip had a sponsorship with the Sucrets cough drop company for their signature metal containers, which are perfect for safely storing glassine envelopes filled with specimens. He also supplied his volunteer collectors with Amphora tobacco canisters. Those, along with Kodak film boxes, BandAid tins, cigar boxes, fishing tackle boxes and Tupperware tubs were dutifully returned to him by his Alaska Lepidoptera Survey volunteers, packed with glassine envelopes containing butterflies and moths from across Alaska. Dr. Philip would then tape an index card to the container, and using a black marker, he would enscribe the year, locality, and collector's last name in his hasty scrawl.

Cleaning, inventory and databasing

My first task once I began work in June of 2014 was to spend over a month scraping white naphthalene crystals out of grooves carved in the sides of each drawer. I worked in a fume hood, and placed the specimens in a different drawer while doing this. While the crystals are long gone now, the drawers still carry this scent! After cleaning, each drawer of specimens was placed in a -40°F freezer for two days to kill any pests. After the freezer, I brought each load downstairs to the collection range where I inventoried each container.

I counted total numbers of specimens and attempted to decipher Dr. Philip's handwriting so that I could enter whatever information was on the container into a spreadsheet. Each container received a unique numerical code,

based on its place in the collection, so that I could find it again. I also searched for specimens which were on loan to Dr. Philip from the Smithsonian and other institutions. I learned how to database these and also National Park specimens using ARCTOS, a collection management program used by UAM. Time passed quickly down in the collection range, studying each container and wondering about the places where each creature had flown.

2015: First visiting lepidopterists arrive for the collection

May of 2015 brought the first of several researchers to UAM to use the collection. The longest visitor, Dr. Zdenek F. Fric, was a Fulbright scholar from the Czech Republic. He and his family spent the entire summer in Alaska collecting butterflies along all the major road systems to analyze genetic patterns across Beringian species. Dr. Fric kindly identified specimens from Dr. Philip's collection along with butterflies which were brought to the museum by citizens of Fairbanks. Several people who collected for the Alaska Lepidoptera Survey have continued to send in or hand deliver specimens to UAM.

Dr. Fric helped in my curation efforts immensely when he translated the labels of drawers that Dr. Philip had obtained from eastern Russia, written in Cyrillic. At the end of the summer, Dr. Fric also generously donated several hundred butterfly specimens which he collected to UAM. All the 2015 Lepidoptera donations are still being curated but once complete those data will be publicly accessible in ARCTOS. He collected butterfly legs off these specimens and others from Dr. Philip's collection for DNA analysis in his home country. Once his research is complete, I will share notice of his findings through the AKES's listserv and website.

Dr. Andrew Warren, senior collections manager at the McGuire Center for Lepidoptera and Biodiversity (MGCL) in Florida, visited the collection in June of 2015 to examine butterflies in the genus *Oeneis*. He was particularly interested in viewing *Oeneis chryxus* specimens, as he had discovered within the MGCL collection a series of butterflies collected along the Tanana River which were darker and larger than the *Oeneis chryxus* of western Canada and elsewhere. When we looked through the drawers together, I saw how Dr. Philip had placed a determination of *Oeneis chryxus*? on some of these specimens.

Upon returning from his visit, Dr. Warren dug into this mysterious creature by examining hundreds more Alaskan specimens from public and private collections. He found both morphological and genetic differences in this animal and has since designated the butterfly a new species, *Oeneis tanana*. The paper describing these findings (Warren et al., 2016) was published 15 March 2016 in *The Journal of Research on the Lepidoptera*. Each of these projects is certain to bring

increased attention to Alaska's butterfly species, a mission which Dr. Philip initiated upon his arrival here in 1966.

Import of the Alaska Lepidoptera Survey databases

In late September of 2015; the entirety of the Alaska Lepidoptera survey databases were made publicly accessible in ARCTOS, our museum collection management system. Dr. Philip maintained several databases of butterflies which he or ALS volunteers had collected until 2005. The databases were imported after months of work by Matt Bowser, Derek Sikes and myself. We had discovered that there were collecting events within the volunteer database that had no geographic coordinates. To determine precisely where that volunteer had collected, each locality was searched on Google Maps, Google Earth, and occasionally even in Orth (1971).

As a relative newcomer to Alaska, I was only somewhat familiar with the North Slope before moving to Fairbanks. It was incredible to search for each of these localities on a map to gain a deeper appreciation for the vast reaches of the Alaska Lepidoptera Survey. I am happy to report that the vast majority of localities were found, with only a handful remaining which were too ambiguous to confidently decipher. I maintain hope that when the time comes, further information on these localities may be revealed as Dr. Philip's specimens are curated and his paperwork is organized.

Butterflies of Alaska, first edition

After all the georeferencing was complete, the ALS databases were uploaded to ARCTOS and it finally became possible to create dot maps portraying the range of every species. During our time of working on the georeferencing of these data, Dr. Cliff Ferris, one of Dr. Philip's best friends, had undertaken writing the first *Butterflies of Alaska* field guide. This project was one that Dr. Philip intended to complete himself but died before that could be actualized. He did manage to capture live photographs of almost every species of Alaska's butterflies, and those photos accompany pinned specimen images taken by Dr. Ferris. The guide (Philip and Ferris., 2015) was authored by Dr. Philip (posthumously) and Dr. Ferris. It became available for sale in December, 2015. Bioquip sold copies online, and several booksellers across the state purchased orders. In Fairbanks, the guide is sold at the University of Alaska Museum, Gullivers Book Store and Creamer's Field. The furthest order for copies came from Japan, from a bookseller and butterfly collector who had traded specimens with Dr. Philip! There were only 500 copies printed, and these sold out by the end of January, 2016. A second edition is being printed

soon to include the new species, *Oeneis tanana*. It will be available before butterfly season, 2016—keep an eye on the AkEntoNet-L listserv for an announcement!

Curation efforts continue

Coming into butterfly season of 2016, it feels as though the past two years have gone by in a flash. It has been my sincere pleasure to care for Dr. Philip's collection, and I look forward to my coming months of work with it. I am happy to share that I am now the curatorial assistant to Dr. Derek Sikes and a graduate student at the University of Alaska Fairbanks. I began in September of 2015 and am using the collection to ask several research questions. These will be detailed in a future article in the *AKES Newsletter*. This semester, I am currently training 16 undergraduate students to link Dr. Philip's specimens to their digital records. Another undergraduate student is working to photograph every drawer in the collection. Once complete, these will be publicly accessible and also will go on display in an exhibit planned for 2017 at UAM. It will be wonderful to share the life and legacy of Dr. Ken Philip and his Alaska Lepidoptera

Survey with museum visitors. Until then, I look forward to sharing future news of work on his collection with the Alaska Entomological Society community.

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The Blackberry Skeletonizer, *Schreckensteinia festaliella* (Hübner) (Lepidoptera: Schreckensteiniidae) in Alaska

by Matt Bowser¹, Matt Goff², and Kristin DuBour³



Figure 1: Photo of *Schreckensteinia festaliella*, Sitka, Alaska, 29.June.2008 by Matt Goff (<http://bugguide.net/node/view/197612>).

The Blackberry Skeletonizer, *Schreckensteinia festaliella* (Hübner, 1819), now appears to be present in eastern Alaska. A Palearctic species, *S. festaliella* was first reported in Canada by Pohl et al. (2005) and has more recently been documented from as close to Alaska as British Columbia (Pohl et al., 2015). This species had not reported from Alaska by Ferris et al. (2012). Although no specimens are available for definitive confirmation, two recent observations are consistent with its presence in the state.

The first was a moth photographed by Matt Goff in Sitka on June 29, 2008 (BugGuide record 197612) that was later tentatively identified from the photographs as *S. festaliella*. Derek Sikes made a corresponding observation record on Arctos: UAMObs:Ento:234757.

The second record is from a Forest Inventory and Analysis Program pilot project (Andersen et al., 2015) on Tetlin National Wildlife Refuge. Sweep net samples from twenty-six sites had been sent to Research and Testing Laboratory, Lubbock, Texas, for next-generation sequencing on an illumina MiSeq using the ZBJ-ArtF1c/ZBJ-ArtR2c primer set (Zeale et al., 2011) targeting COI, yielding a

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