The Ohio State University

Museum of Biological Diversity

Newsletter

Spring semester 2013

College of Arts and Sciences. Department of Evolution, Ecology and Organismal Biology

Dear Readers:

Welcome to the **Spring Semester** 2013 **MBDNewsletter**! Despite of the cold weather here in Columbus, this issue is steaming hot with engaging articles, with quite a few people in the water. So grab your waders or your wet suits and enjoy the newsletter!

Follow our scientists and students as they strive to reintroduce an endangered species of freshwater mussel back to Ohio streams, or as they collected beautiful and rare to find species of fishes, or dive for sea anemonae in the warm waters of the Florida Keys. Back to dry land, we have birders's tales, tricky land snails, and so much more.

On the **Special Feature**, *Pioneers of our Collections*, you will meet some of the people who helped build OSU's magnificent biological collections and to conserve them for posterity.

Our regular features – **News & Updates**, **Recent Publications & Presentations, Field Work & Research Travel** – provide a broad view of our activities and projects, highlighting our most significant accomplishments. As always, we welcome your comments, questions and suggestions!

Please note: The Ohio State University moved to semesters and to adjust to the new academic calendar we have changed the timing and frequency of the newsletter. From this issue on, the **MBDNewsletter** will be published every four months (**Spring**, **Summer** and **Fall Semester Issues**.)☘

In this issue:

Cover: Yellowline arrow crab. (Photo courtesy of B. Titus)

Museum of Biological Diversity
Discovery · Documentation · Interpretation · Education
Newsletter
Editor: L. Musetti

Reintroducing an Endangered Species to Ohio: The Northern Riffleshell.

by G.T. Watters

Left to Right: NRS female parasitizing a host darter. PIT tags affixed to NRS. Collection site at the Allegheny River.

Freshwater mussels are the most imperiled animals in North America, with dozens of species pushed to extinction in the past 200 years. Of Ohio's initial fauna, about 80 species, two thirds are extinct, extirpated, or listed. One of those is the state and federally endangered **Northern Riffleshell (NRS)**, *Epioblasma torulosa rangiana* (Lea, 1838). The genus *Epioblasma* is one of the hardest hit of all animal genera – with the exception of two species, every *Epioblasma* is either extinct or federally endangered. The two remaining species were just described and will eventually be listed as well.

NRS is not your average mussel. Like most freshwater mussels they have a parasitic larval stage that infests fishes. In the case of the NRS these hosts are darters and sculpins. They parasitize the host when a fish gets a little too nosey and sticks its head between the shells of the female. She instantly snaps her shells shut on the fish, like a bear trap, and proceeds to blast the head of the unfortunate fish with thousands of parasitic larvae. After 5-10 minutes she releases the fish. Typically, 5-6 weeks later transformed juvenile mussels will excyst from the fish, drop to the bottom, and begin life as free-living mussels.

Once found throughout the upper Ohio River system and in a few Great Lakes systems, the *only* reproducing population of NRS remaining is in the upper Allegheny River in Pennsylvania, where it is doing remarkably well for reasons not quite understood. In Ohio it was last seen in Big Darby Creek at the Battelle-Darby Creek Metro Park perhaps 15 years ago. At that time there were water quality issues that eliminated the species from Darby but those problems seem to have been solved. There is now abundant evidence that mussels are making a comeback to Darby.

So it occurred to me, if NRS is still abundant in the Allegheny, perhaps we can move some of them to Darby and attempt to restart that population. After all, genetics had shown that the populations in Pennsylvania and Ohio were similar. Darters, the hosts, are abundant in Darby. But the red tape and logistics of such a move were daunting. Two US Fish and Wildlife Regions, the PA Fish and Boat Commission, the ODNR Division of Wildlife, Columbus Metro Parks, the Columbus Zoo and Aquarium, the Ohio State University, and Columbus Parks and Recreation all would be involved. Federal and state permits would be needed, often no easy task to procure. But to everyone's credit it went impressively easily. First we had to move a trial population of 50 to see if they would survive. Once we broached the idea, other states wanted NRS as well. But no one was to get any until the results of our trial were positive. No pressure. But we recovered 48 of the 50 alive and the relocation began in earnest.

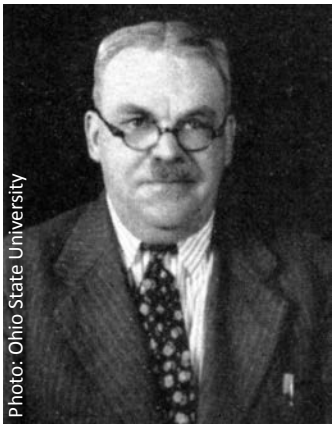
To date 6,115 NRS have been moved to Battelle-Darby Creek and Prairie Oaks Metro Parks, the largest introduction of an endangered species in the history of Ohio. The last collection became a multi-state effort as other agencies were allowed to move NRS based on our success. In order to monitor the relocated mussels (they burrow out of sight beneath the substrate), every one has been affixed with a "*Passive Integrated Transponder*" (PIT) tag ($3-$5 a piece). We are recovering an average of 30% in our original study areas, some after five years. We know that many have washed downstream during high water events so we believe

Left to Right: The collection crew. Release of NRS specimens into Big Darby Creek. Monitoring the reintroduction of NRS.

the percentage still living is higher than 30%. This year we will begin to look for signs of successful reproduction as well as continue to introduce more individuals. The project was funded by the US Fish & Wildlife Service, the ODNR Division of Wildlife, and the Columbus Zoo and Aquarium.☘

Special Feature: *Pioneers of our Collections*

The Ohio State University has been home to biological collections since its early years. Each of the collections has a very peculiar history and character, but they all exist as we know them today because of the passion and life-long work of some very dedicated and determined individuals. In this issue of the MBDNewsletter we honor a few of the people who contributed to building, organizing and caring for our collections. We hope you will enjoy the following articles, and like us, develop a deep appreciation for scientists and naturalists to whom we owe so much.



William Morton Barrows (1883- 1946).

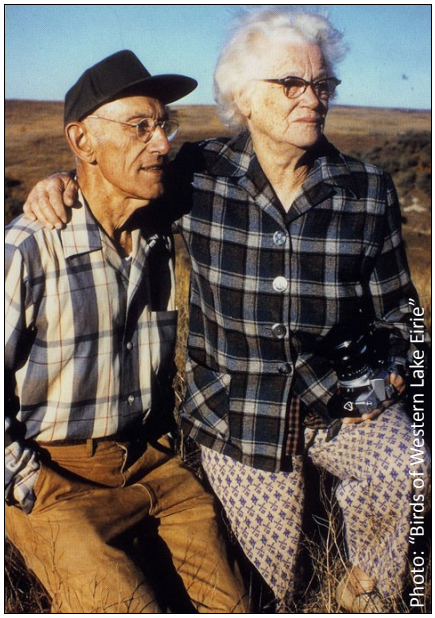
William Morton Barrows.

by Richard Bradley

Early in the history of The Ohio State University the departments of Entomology and Zoology were combined. Dr. William Morton Barrows (1883-1946) was a member of this combined department from 1909 to 1945. The work of Dr. Barrows in the systematics, behavior and biogeography of spiders resulted in at least 12 publications. He and co-authors described 51 new species of spiders. He also published the first comprehensive lists of spiders for Ohio in 1919 and 1924. He collected extensively in Ohio, the Appalachians, and Florida. The Barrows collection is the foundation of the spider collection here at The Ohio State University, **Acarology Laboratory**.☘

An important figure for the Zoology Museum: Milton Bernhard Trautman, Ichthyologist and Ornithologist.

by Don Gartman & John M. Condit



Milton B. Trautman (1899-1991) and Mary (Auten) Trautman (1898-1986).

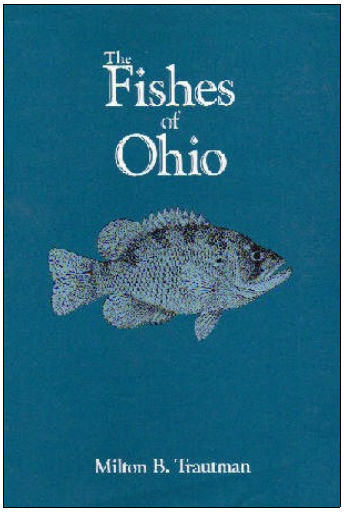
Milton Trautman was born in 1899 as the only child of German immigrant parents in German Village, Columbus, Ohio. Because of ill health his formal education ended as a high school sophomore, but throughout his life he received education from scientists of the highest order. When he was a child his parents took him on a trip to Lake Huron to recuperate from whooping cough, but Milton was so enthralled by the small fishes he saw from the pier waiting for the ferry at Lake St. Clair that the family decided to stay there. He caught the fish, kept them for the day in a tub, then released them each evening to start the whole activity again the next day. On weekends the family often took the electric train to Buckeye Lake where Milton's interest in fishes and birds grew. They would also travel to Big Darby Creek, the only site where Milton discovered the now probably extinct Scioto Madtom that is named for him: *Noturus trautmani*.

Milton kept daily notes on what he saw, heard or thought about. He said he even recorded how many fish and wild foods he caught or foraged and ate for his meals. Today the OSU library archives his journals, which amount to over 15,000 pages.

Despite his early love for nature, Milton followed in his father's profession and became a master plumber. Soon though, he was noticed for his interest in natural history by several professional biologists in the state government and professors at The Ohio State University. In 1930 he joined the newly formed Ohio Division of Conservation as a fish biologist and soon thereafter moved to the Museum of Zoology at the University of Michigan to work with fishes and birds. His friends used to joke that he did his best work on fishes when he was supposed to be working on birds, and his best work on birds when he was supposed to be working on fishes. While at Michigan he worked with Ichthyologist Carl Hubbs and made several expeditions with the distinguished ornithologist Josselyn Van Tyne to Central America to collect birds. He also wrote the book "*The Birds of Buckeye Lake, Ohio*", published by the University of Michigan Museum of Zoology. Milton returned to Ohio in 1939, where he studied and consolidated information on Ohio fishes at the Ohio State University's Stone Institute of Hydrobiology at Put-in-Bay for 16 years.

In 1940 Milton married **Mary Auten**, a professor of biology at Ashland College, Ohio and found in her the perfect partner. They built a home on South Bass Island and for the rest of their lives worked as a team to produce some of the most detailed work on fishes and birds from Ohio as well as many other places. They were in the field collecting, or in the hatchery working on a manuscript which was published in 1957 as the renowned book "*The Fishes in Ohio*". This book is proof that Milton accomplished his goal to collect fishes from every stream in Ohio -- just look at the maps with the thousands of locality records on the streams from first-order drainages to Lake Erie and the Ohio River! The book encompasses 683 pages of descriptions, drawings,

distribution maps and habitat information for each of Ohio's 172 known species of fish. Trautman had become a worldwide expert within the ichthyology field, known for his degree of precision and accuracy.



Trautman's renowned book on the fishes of Ohio.

Every day during bird migration season Milton would walk around Perry's Monument to collect the birds that hit the tower. Milton was sure that the Kirtland's Warbler, one of the rarest members of the wood warbler (Parulidae) family, would be migrating over South Bass Island, but at that point no sighting had been confirmed. Late one evening he was on his "bird walk" around the monument when a Kirtland's Warbler crashed and hit him on the head! He was right! This bird and many others that he collected were made into bird skins and donated to the OSU collection. For decades Milton was the authority on the distribution of the birds of Ohio; he published state lists in 1932 and 1935, and, with his wife Mary, based on museum specimens, the "*Annotated List of the Birds Of Ohio*" in 1968.

In 1955 Milton transferred to Columbus, where he became the Curator of Vertebrates at the museum, and a member of the Department of Zoology and Entomology. He officially retired in 1970, but he and Mary continued to come to campus every day to curate the bird collection. In 1983 they published a revised second edition of the fish book. They then started working on a manuscript, "*The Birds of Western Lake Erie"*, which was published posthumously.

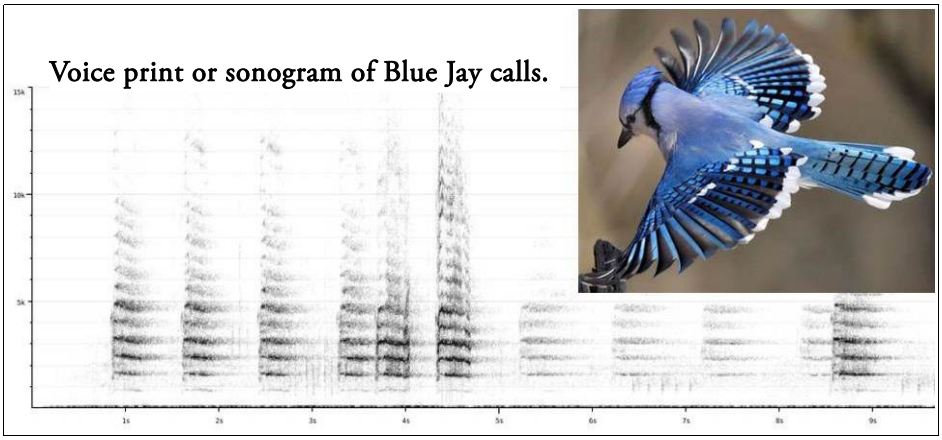
Milton was a naturalist of the old school. Most of his evidence came from specimens and field observation. When he heard of an interesting bird, he reached for his shotgun. He added uncountable fish specimens and 2,757 birds to the collection, collected in 26 states in the USA, and many from Fairfield, Licking and Franklin County, Ohio. He collected and skinned his last bird, a Cooper's Hawk, in May 1988. His curiosity extended to everything in nature - mammals, reptiles, insects, and plants. Besides fishes and birds he added 300 lots of amphibians, 150 reptiles and 250 mammals to the vertebrate collection.

Milton received an honorary doctorate from Wooster College, and Mary and he both received honorary doctorates from The Ohio State University. Both were inducted in the Ohio Conservation Hall of Fame. They ceased coming daily to the museum in the late 1980s when their health started to fail. Mary passed away in 1988 and Milton in 1991. Milton was fortunate in living in the age where knowledge was more important than a formal education.☘

Sound recordings of three notable recordists have crossed paths at the Borror Laboratory of Bioacoustics.

by Sandy Gaunt

The collection of recorded animal sounds at OSU known as **The Borror Laboratory of Bioacoustics** (BLB) grew from the pioneering sound recording efforts of **Donald J. Borror** (1907-1988). Borror, a native Ohioan, began recording and studying animal sounds just after World War II as war-related technology for capturing and analyzing sounds became available to the public. He obtained his first magnetic tape recorder in 1947, and made his first recording of a Blue Jay (*left*) in the Spring of 1948.



As a taxonomist and museum trained entomologist, Borror could not resist the temptation to describe and organize the sounds he captured. In fact, perhaps one of his greatest contributions was recognizing and treating the taped sounds as true museum specimens - documenting metadata, organizing those data and the physical magnetic tape specimens for maximum ease of retrieval by species.

Important to Borror's efforts was the introduction of yet another instrument, the audiospectrograph. Borror published one of the first bird voice prints, or sonograms, in the avian literature and was able to demonstrate, among other things, that some birds produce two independent sounds simultaneously. Borror made close to 15,000 recordings of animal sounds over four decades; still today one third of the recordings in the BLB were archived by him.

But like any animal specimen, with time deterioration sets in. The physical media on which the sounds were captured, magnetic tape, begins breaking down after about 50 years. The BLB sound collection like any other collection, was in danger of permanent loss. Again new technology which had ignited the field of bioacoustics has now extended the life of this new field – digitization of sounds, which makes the retrieval of specimens infinitely easier. The BLB has taken the lead in not only digitizing its own collection of animal sounds but also that of other collections. Two of them are notable and share an interesting history.

John William Hardy (1930-2012), like Don Borror, was a museum trained animal sound recordist and recognized the

importance of sound recordings as specimens. Hardy tirelessly cajoled his fellow bioacousticians to deposit their recording efforts in public archives and reference them in publications, and with Borror was instrumental in founding an international newsletter on bioacoustics that later became the *Journal of Bioacoustics*. From 1961-1973 Hardy was curator of the Moore Laboratory of Zoology at Occidental College, Los Angeles, CA. The Moore Lab emphasized collections from Central and northern South America, where Hardy avidly pursued bioacoustic studies, especially on parrots and corvids. He produced many recording monographs on bird groups, such as "*Voices of New World Thrushes*" or "*Voices of the Tinamous*". When Hardy left Occidental College for a curatorial job at the Florida State Museum of Natural History (1973-1985), he had the third largest collection of recorded animal sounds in North America, which he left at the Moore Lab.

Luis F. Baptista (1941-2000) replaced Hardy as the curator of the Moore Lab and its sound collection from 1973-1980. Baptista's studies in bioacoustics spanned descriptive and experimental fields describing song learning and song dialects in white-crowned sparrows. From his research he added to the core collection of sound recordings at the Moore Lab. When he departed in 1980 to become curator of Ornithology and Mammalogy at the California Academy of Sciences in San Francisco he took his own sound recordings with him. In 1984 negotiations resulted in a permanent loan of the Moore Lab sound collection to the Florida Museum of Natural History.

The BLB obtained Baptista's collection from the California Academy of Sciences in 2000 and has been digitizing the recordings to save them for posterity. Through an NSF-grant in collaboration with the Florida Museum of Natural History the BLB has been digitizing all of Hardy's recordings for the last 3 years. Thus today a triangle connecting these three historic collections has been completed, in part because retired curator of the BLB, Sandy Gaunt, had known Bill Hardy since an undergraduate at The University of Kansas and had collaborated with Luis Baptista in Costa Rica on hummingbird dialects. ☘

The Knull legacy – Josef Nissley Knull.

by N. F. Johnson & L. Musetti

Joe Knull collecting in 1957.

Numerous arthropod collections were assembled in an uncoordinated fashion by early students and faculty at The Ohio State University, but the actual initiation of a formal collection began when Josef Nissley Knull (1891-1975) was hired in 1934 as full-time curator. For 28 years, Professor Knull devoted his career to the expansion and arrangement of the collection. Each summer of those 28 years, and those afterward during his retirement, was spent in the field with his wife and fellow entomologist, Dr. Dorothy Johnson Knull. Most years they made 3-month long expeditions to collect in the southwest, from **Big Bend National Park to the Chiricahua Mountains, southern California and Nevada.** Both were outstanding collectors, and the results of their efforts are reflected in the volume and diversity of material they added to the collection.

Joe Knull was interested in all insects, but his true first passion was the study of beetles. He published 194 papers between 1918 and 1975, particularly on the families Buprestidae, Cerambycidae, Elateridae and Cleridae. Many years of field work with emphasis on beetles have created a truly outstanding collection of North American Coleoptera, particularly the midwestern and the southwestern states. Davidson & Bellamy (2005) provide a complete list of Knull's entomological publications.

Many prominent private collections, which formed the nucleus of the Ohio State Insect Collection, were incorporated during the years of Joe Knull's tenure. Notable among these were the H.W. Wenzel Coleoptera (beetles), Herbert Osborn Homoptera and Hemiptera (true bugs and hoppers), J.S. Hine Diptera (true flies), R.A. Leussler and W.N. Tallant Lepidoptera (moths and butterflies), C.H. Kennedy ants, D.J. Knull leafhoppers, W.M. Barrows spiders (now at OSU Acarology Laboratory), and the Alvah Peterson collection of immature insects.

Joe Knull was notoriously meticulous in his care for the collection. He was held up by most entomologists across the country as the extreme example of tidiness and organization. We still have many drawers of beetles that were arranged by him: long series of accurately determined, properly mounted, neatly positioned, and perfectly preserved specimens (*left*).

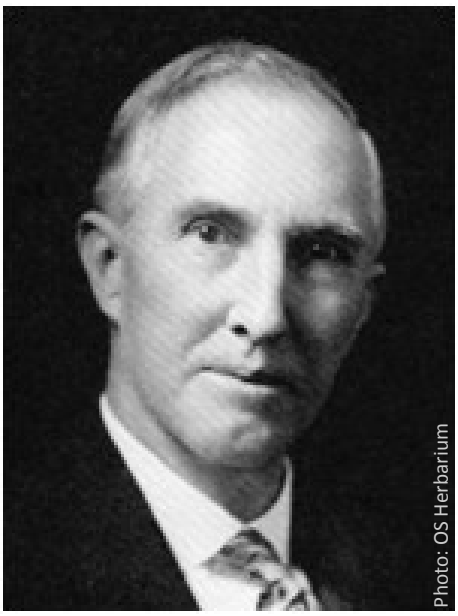
Professor Josef Nissley Knull died here in Columbus, on April 24, 1975 at the age of 83. His last publication came out that same year. He was a tough act to follow!

Visit the new website for the **Triplehorn Insect Collection** (*http://osuc.osu.edu*) and the collection's Facebook page at *www.facebook.com/TriplehornInsectCollection/* for more on OSU collection-related entomological historic figures.

Reference: Davidson, J. M. & C. L. Bellamy. (2005). The Entomological Contributions of Josef Nissley Knull (1891 - 1975). Zootaxa 37: 1-24. ☘

The Botanical Works of John Henry Schaffner.

Mesfin Tadesse & John V. Freudenstein



John H. Scaffner.

John H. Schaffner was a Professor of botany who succeeded the founder of The Ohio State University Herbarium (OS) and Chair of the Department of Botany, Professor W. A. Kellerman in 1908. During his tenure, particularly as manager of the collections from 1908 to 1918, the Herbarium saw significant improvements in acquisition of specimens through gifts, exchanges with other herbaria in the US and donations, curation and cataloguing of specimens. He also contributed over 2,000 specimens of vascular plants, particularly members of the genus *Equisetum*. His collections of *Equisetum* in the Ohio State University Herbarium are among the best curated and annotated. The collections were numbered following the system of Bentham and Hooker of 1894.

Arranging the specimens according to the then prevailing phylogenetic system and providing accession numbers to specimens was started during his time. Below we present brief accounts of the life and works of Schaffner, particularly as these relate to the collections and his contributions to the development of plant biology.

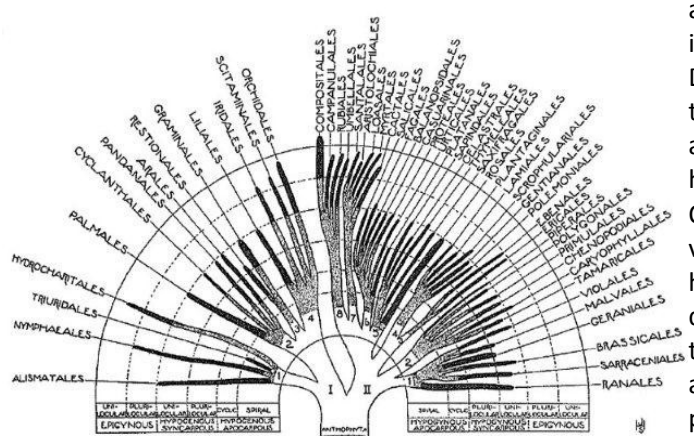
Early Life. John H. Scaffner was born in Marion County, Ohio, near the Agosta prairie which was enclosed with forests, but his family moved early in his life to Clay County, Kansas. As a small shepherd boy in Ohio, he tended cattle, observing and studying both small and large plants and nearby objects but when he moved to Kansas, he was confronted with a sea of grasses interrupted only by trees planted by pioneers. This led him to focus on another interesting subject, Geology, which 'became his first love in science, though he was far from anyone who could talk much about it and had few books that could help him.' At school, he enjoyed music and played the piano and organ. The Schaffner family which 'showed ingenuity and originality' also made 'mechanical wooden toys, and even a primitive camera lucida, which was set up for reflecting pictures on a screen.'

Brief College Life. Since the classics were the only kind of education available in most of the colleges from 1880 to 1900, Schaffner studied Greek and Latin. This proved extremely useful in his later scientific work, affording him a careful training in the exact derivation of words and avoiding the 'polyglot mixture of Greek and Latin' prevalent in those times. His research interest in botany developed when he joined Baker University and worked under the guidance of Dr. Charles Sylvester Parmenter who also helped him get a job as a teacher of natural sciences in the Methodist College at Mitchell, South Dakota. After two years, he resigned from this job and joined the graduate school at the University of Michigan, Ann Arbor where he began intensive work in Cytology under the guidance of Dr. Frederick C. Newcombe. The most controversial topic in the subject then was the 'question of cell organization at mitosis' which essentially related to sexuality in plants – a topic not comfortable for many at the time.

The 29 year old John Schaffner had to have a thorough 'reading knowledge of French and German' to prepare one of his pioneer research papers. Of the thirty-five references in this publication, only two are in the English language. Schaffner's work on the behavior of chromosomes at mitosis and meiosis was soon considered 'as the beginning of the evidence in plants for the studies in Mendelism and heredity'. Soon Schaffner gained well-deserved recognition for his work and was asked to join The Ohio State University by Professor W. A. Kellerman, the first professor of botany at the University.

The Ohio State University's Botanical Specimen Collections. The botanical collections of the Ohio State University had a modest beginning in 1891. They were kept in the 'Botanical Hall', a building that no longer exists and was at the site of the present Faculty Club, next to the historic Orton Hall. The collections were divided into two parts: a general herbarium, which included flowering plants, ferns, mosses, fungi, algae, and a State Herbarium, which had a collection of fruits and seeds, valuable timbers, woods, grasses and various economic products. In 1897 there were over 20,000 specimens constituting the entire collections. This grew to over 30,000 by 1902 with Kellerman doing most of the collections and Schaffner helping in his teachings.

Schaffner contributed research articles in embryology, plant physiology and phylogeny while also being a teaching assistant and associate to Dr. Kellerman. After the sudden death of Kellerman in 1908, Schaffner assumed full responsibilities of headship of the Department of Botany until 1918. During his tenure as manager of the collections, he established contacts with resident plant collectors and obtained a large number of specimens as gifts, with other herbaria in the United States and obtained specimens in exchange for Ohio plants. He also initiated the production of catalogues of the vascular plants of Ohio and accessioning of specimens. After 1918, he devoted his time to research particularly in plant classification and developing principles in taxonomy. Schaffner worked on his outline of the classification of plants which he had already published in 1905 and also on a "*tree of the sixteen phyletic groups*" (*left*) which he had published in 1910 in the second edition of his own journal called



"*Laboratory Outlines"*. Schaffner worked on the classification of the genus *Equisetum* for a period of over 20 years.

Contributions to Botanical Science. Schaffner published 110 papers in systematic botany (Taxonomy and Floristics), 15 papers in Evolution, 26 papers in Ecology, 35 papers in Genetics and Cytology, 38 papers in Plant Morphology, and 36 papers in Plant Physiology as well as over 70 items such as laboratory manuals, book reviews, news and notes.☘

News & Updates

▪ ***Borror Laboratory of Bioacoustics (BLB) & Tetrapod Division*. Sounds.** The Borror laboratory has been working with **Jim McCormac**, a naturalist at the Ohio Division of Wildlife, on sonograms of wood warbler species for McCormac's upcoming book on "Wood Warblers of Eastern North America". The sonograms will provide readers with a visual presentation of the often very elaborate songs of the warbler species and will make it easier for them to learn to distinguish between species by sound.
The Borror laboratory has provided 23 recordings of wading birds for an ebook by Bloomsbury Publishing, London. Recordings of other species may be used in future productions.

In the press. The Tetrapod collection was featured in The Columbus Dispatch on Sunday November 11th in an article about how the collection is coming back to life.

New material. 1) EEOB program coordinator, **Kevin Lumney**, secured a disarticulated skeleton of a Florida manatee from the Columbus Zoo. This skeleton will be used for teaching in the future. 2) **Dale Gnidovec**, Curator of the Orton Geological Museum and Bob Glotzhober, curator at the Ohio Historical Society, started transferring prehistoric material of Mastodons (Orleton and Williams) and Mammoths to the Geology museum where they will be used in a display. In the process every bone is identified, labeled meticulously and placed in a box for interim storage.

Specimen Loans. 1) Naturalists at Clear Creek Metro Park borrowed an Allegheny Woodrat (*right*) for an educational event. The endangered Allegheny woodrat, a medium-sized, night-active rodent, had been found in this ecologically and geologically important valley in the last century. However, over the last decades this woodrat species has disappeared from most historic sites and can currently only be found in Ohio in a single population in Adams County. The Allegheny Woodrat has been on the list of endangered species since the 1970s. 2) **Sherri Andersson**, Wildlife Biologist at Katmai National Park and Preserve in Alaska, inquired about specimens from Katmai National Park held in the Tetrapod Collection. Indeed the OSU Tetrapod collection houses 46 bird species (78 specimens) and 5 mammal species (14 specimens) that were collected at Katmai NP in 1917-1962 including such charismatic animals as North American River Otter, Arctic Ground Squirrel, Barrow's Goldeneye, and Harlequin Duck. 3) **Tom Domin**, volunteer with Highbanks Metro Parks, borrowed 12 specimens of local bird species for a public program on nest monitoring cameras.

Allegheny woodrat: prints, plus live and preserved specimens.

Visitors: Daniel Allard, wildlife artist from Pataskala OH, visited the bird collection to review some waterfowl specimens for his next piece for the upcoming Ohio duck stamp competition. Artists value the opportunity to see details of certain species up close and several wood carvers have perused the collection before. **Ralph Pfingsten**, independent amphibian researcher, "salamander guru of Ohio" and author of the "Ohio Salamander Atlas (2003)", revisited the salamander collection to research in more detail the complex of unisexual individuals of the Jefferson salamander, *Ambystoma jeffersonianum,* and the Small-mouth Salamander, *A. texanum,* specimens. He also revisited distribution data of the Eastern Red-backed Salamander, *Plethodon cinereus,* and the Ravine Salamander, *P. richmondi*, for his upcoming book "*The Amphibians of Ohio*". **David Slager**, MS graduate from OSU's School of Environment & Natural Resources, has been preparing several freezer-stored birds into museum study skins (*right*). Many of these specimens had been collected during the "Lights Out Columbus" project in downtown Columbus or were window kills from buildings on the OSU campus. Two undergraduate students, Sarah Focht and Stephanie Malinich, who work in the bird collection, were also trained in the skills of preparing bird study skins.(*A. Nelson*)☘

Red-headed Woodpecker skin being prepared.

▪ ***Fish Division.*** **New finds.** There exists in the OSU Museum of Biological Diversity a treasure trove of uncataloged biological specimens. Included among these are some quite rare and valuable species that were shelved for future processing, and that eventually were overlooked as time passed. Currently in the Fish Division efforts have been accelerated by the recruitment of help funded by the Division of Wildlife OBCP Fishes of Ohio project to catalog these specimens, which is in keeping with the overall mission of the museum to document natural history of the species. Included most recently in the finds among the backlog of uncataloged collections was a specimen of **Pugnose minnow**, *Opsopoeodus emiliae* (*right*). This species may now only be found in Nettle Lake of northwest Ohio, but the recently cataloged voucher represents the last known collection by Ohio EPA in 1986 from Long Lake in Summit County. Additionally, historical collections of state endangered **Iowa darter**, *Etheostoma exile* (*right*), were found from the Portage Lakes area in Summit county collected by OEPA and a single specimen collected by the late Curator of Fishes Milton B. Trautman from a natural lake near Dayton, Ohio.

Pugnose minnow, *Opsopoeodus emiliae*.

Iowa darter, *Etheostoma exile*.

Brian Zimmerman has also spent many hours examining records (with or without matching physical vouchers) of fish captures from Ohio EPA Surface Water crews. These records (numbering over 400,000) represent over 30 years of fish collections by OEPA from Ohio waters and will be published online in the Fish Division Database of Fishes. These records will compliment an earlier 30,000 records provided by 50 some years of collecting by ORSANCO (Ohio River Regional Sanitary Commision) crews on the Ohio River and its tributaries.

Two students, Maira Kannal and Ailene Parrill, from the Graham Experimental High School internship program, assisted Marc Kibbey and Charles Wentzel in the Autumn with curation and maintenance of the cataloged collections. These efforts involve confirming the identity of the species and the validity of the localities associated with the vouchers, re-labeling and replacing unsuitable containers, and replenishing the ethanol preservative. The ethanol in the jars or stainless steel tanks can evaporate due to older, less serviceable lids, or become diluted with fish oil or water in the fish's body due to osmosis, or with water vapor due to transpiration. A large portion of the collections that were cataloged on paper were overlooked and not recorded in previous Fish Division computer databases and consequently will comprise new records online. *(M. Kibbey)*☘

▪ ***Molluscs.*** **Samantha Spence** joined the Division of Molluscs recently as an undergraduate student intern. (*G.T. Watters*)☘

▪ ***Triplehorn Insect Collection.*** On 14 January, 2013 we lauched our **new collection website**. Besides general information about the insect collection, the new site offers access to the specimen records of all our +3,000 primary types. Visitors can search our database by taxon or by author, and restrict the search to a particular taxonomic group. In the next weeks and months we will be unveiling new features which will allow visitors to visualize our specimen data in useful and innovative ways. Please visit us at http://osuc.osu.edu/. For those interested in the history of the insect collection, check out our photo album "*People and History of the Triplehorn Insect Collection*" on Facebook (http://www.facebook.com/TriplehornInsectCollection).

Visitors: The Triplehorn Insect Collection welcomed the visit of Dr. John Obrycki, Chair, Dept. Entomology, University of Kentucky, Dr. Sharron S. Quisenberry, Vice President for Research and Economic Development, Iowa State University, and Dr. Marc Linit, Associate Dean & Director for Research & Extension, University of Missouri. The visit was part of the program review of the Department of Entomology (22 October 2012).

Also visiting for a quick tour of the collection were **Dr. William E. Browne**, EEOB seminar speaker from the University of Miami, FL (16 November 2012), and the **new undergraduate students** of the Dept. of Entomology (25 November 2012).

The **Ohio Lepidopterist's Society** held their "ID day" in the insect collection on 01 December, 2012. The lepidopterists visited us again on 19 January 2013 for their annual meeting.

Departure: On the first week of January we said goodbye to our friend **Ryan Caesar**. He has accepted a postdoctoral position with Daniel Rubinoff at the University of Hawai'i. There he will be working on a collection digitization effort and also doing lab work on various other research projects. Ryan graduated here at Ohio State with a Ph.D. earlier this year and has spent the last semester teaching General Biology at OSU. We wish Ryan and his family the best of luck and much **Aloha**! (*L. Musetti*)☘

Field Work & Research Travel

▪ ***Borror Lab & Tetrapod collection.*** Angelika Nelson attended the first "*Train-the-Trainers*" georeferencing workshop organized by iDigBio (Integrated Digitized Biocollections), the National Resource for Advancing Digitization of Biological Collections funded by the National Science Foundation. The 5-day workshop (8-12 October 2012) brought together curators and collection managers from around the USA who wanted to get information on georeferencing and learn about standardizing the georeferencing protocols of their collections. The four trainers were pleased with how the exercises turned out and left enthusiastic to update the protocol at home and/or teach students and volunteers in the collections the newly acquired skills.

So far Angelika has revised the georeferencing protocol for the Tetrapod collection and the Borror lab, and has trained 4 undergraduate and 2 graduate students in these collections.

Angelika Nelson (*left*) and other workshop participants successfully georeferenced the fire hydrant.

▪ ***Fish Division***. Brian Zimmerman and Justin Baker, of the Fish Division, have collected more species that represent new records or records that document reoccupations of former distributions for rare fish species. Included are the state **Endangered Shoal chub**, *Macrhybopsis hyost*oma, in the Ohio River, and dozens of specimens of the state species of concern **Eastern sand darter**, *Ammocrypta pellucida***,** from Symmes Creek (where there was only one specimen vouchered by the Ohio EPA), and from Storm Creek, Lawrence County, near Ironton, Ohio, a new locality record for the species.(*M. Kibbey*)

Justin Baker and Brian Zimmerman collecting fishes.

Ben Titus and Meg Daly spent seven days in the Florida Keys to gather samples for Ben's PhD research on the evolutionary dynamics of the sea anemone-cleaner shrimp interaction. Several species of crustaceans live in association with the Caribbean sea anemone *Bartholomea annulata*. Some of these crustaceans are "cleaners," removing parasites from reef fish: the fish swim up to the anemone, the shrimp picks parasites from gills and skin, and then the fish swim away. These cleaner stations are critical for fish health, and thus for the health of coral reefs.

Ben Titus collecting sea anemonae in Florida.

Despite their importance to maintaining reef health, little is known about recruitment or dispersal for the sea anemones or their symbiotic shrimp. Ben collected sea anemones that host crustaceans, sea anemones without crustaceans, and samples of the crustaceans that are hosted by *Bartholomea*. In coming months, he will conduct genetic analyses to understand gene flow and host choice.

These studies will play a critical role in any future plans for protecting the crustaceans and their sea anemone hosts. The crustaceans (*cover photo*), brightly colored and charismatic, are in demand by the aquarium trade, which has lead to significant pressure on wild populations. (*M. Daly*)☘

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Crappy Snails.

by G.T. Watters

Many land snails camouflage themselves in one way or another. A very few try to look like something non-appealing to would be predators. One group has taken this to the extreme – they look like crap. The genus *Anostoma* is a wide-spread but seldom seen genus of few species (ca. 8) living in Brazil that mimics feces. In order to do this, at maturity it "flips" its shell so that the aperture faces up rather than down. When resting it looks like, well, crap. As an added deterrent, the aperture is lined with obstructions called "teeth" that make it difficult for most predators to enter.☘

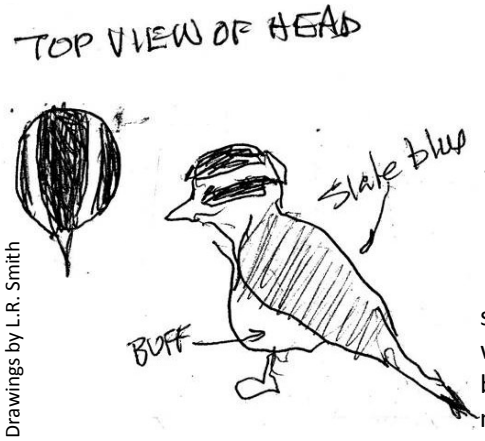
Anostoma ringens (Linnaeus, 1758). Rio de Janeiro State. 33 mm width.

Bird irruptions can puzzle even experienced birders.

by Angelika Nelson

Early December I received a letter form a birder living in Laurelville, Ohio. He puts out a bird feeder for his feathered friends each year but never has he seen the species that has mingled with Carolina chickadees and others at his feeder this year. And he has been bird-watching for more than 50 years, seen rarities and beauties like the Lazuli Bunting or Yellow-headed Blackbird, but never has he had a bird like this at his feeder. I wrote back to him and was able to give him a positive ID based on the drawings that he included in his letter (*left*)*:* a Red-breasted Nuthatch is visiting the feeder.

Red-breasted Nuthatch.



Drawings by L.R. Smith

The Red-breasted Nuthatch is a close relative of the White-breasted Nuthatch that birders in Ohio are so familiar with. The Red-breasted cousin lives in evergreen forests in more northern latitudes, thus does not usually occur in Ohio. However, the Red-breasted Nuthatch is known for its irruptive behavior when large numbers of this species move south in search of food. It seems that this winter is one of these years with shortage of pine cones up north. Birders all over the country have reported Red-breasted Nuthatches and other species feeding on pine seeds (such as *e.g.* Pine Siskins) moving south in search of food. Sightings of Red-breasted Nuthatches have been reported in every southern state except for Florida, including birds on the outer banks of North Carolina, on Grand Isle, Louisiana, in a suburb of Atlanta, and on the Gulf Coast of Texas. Bird bloggers from Wisconsin to Massachusetts have noticed the irruption and blogged about it. I checked ***ebird*** records for sightings in the area around Laurelville and, lo-and-behold, there have been quite a few.☘

Recent Publications

Merckx, V.S.F.T., J.V. Freudenstein, J. Kissling, M.J.M. Christenhusz, R.E. Stotler , B. Crandall-Stotler, N. Wickett, P.J. Rudall, H. Maas-van de Kamer, and P.J. M. Maas. (2013). Taxonomy and Classification. pp. 19-101. ***In*:** V.S.F.T. Merckx (ed.), Mycoheterotrophy: The Biology of Plants Living on Fungi. New York: Springer.

Recent Presentations

Buffington, M., M.W. Gates, N.F. Johnson. "From corniculae to frontal shelves: A phrenological odyssey through the parasitic Hymenoptera". ***Oral Presentation***. Entomological Society of America Annual Meetings. Knoxville, TN, 14 November, 2012.

Johnson, N.F., A.A. Valerio, L. Musetti, C. Taekul, E. Talamas, A. Polaszek, A.D. Austin, J. Cora. "Pattern of host shifts among parasitoid wasps as indicated by a combined morphology and molecular phylogenetic analysis of the superfamily Platygastroidea (Hymenoptera)". ***Oral Presentation***. Entomological Society of America Annual Meetings. Knoxville, TN, 13 November, 2012.

Musetti, L., S. Hemly & N.F. Johnson. "Quantification of the costs of insect collection curation". ***Poster Presentation***. Entomological Society of America Annual Meetings. Knoxville, TN, 13 November, 2012.

Nelson, A. "The Borror Laboratory of Bioacoustics and the Tetrapod Research & Teaching collections at The Ohio State University". ***Invited Oral Presentation***. IdigBio Train-the-Trainers georeferencing workshop, Gainesville, FL, 8-12 October, 2012.☘

Fellowships & Current Grants

Beati, L., **H. Klompen**, L. Durden & **N.F. Johnson**. "REVSYS: Exploiting a large existing resource for biogeographical and host-parasite data: linking immature and adult amblyommine ticks. National Science Foundation DEB, ***$298,865***. (OSU Subcontract). 2010-2013.

Fish Division. "Freshwater Fish Inventory and Distribution project." Under the *Ohio Biodiversity Conservation Partnership*. We will synthesize existing records from the Fish Division with records from the ODOW, OEPA and other sources. The results will guide new collection efforts to generate an accurate, current record of freshwater fish distributions in Ohio, which will be used to help direct future research and management efforts. ***$83,356***. 2011-2012.

Freudenstein, J.V. "Systematics of Monotropoideae and Pyroloideae (Ericaceae)." National Science Foundation, 2009-2012.

Freudenstein, J.V & **M. Tadesse**. "Databasing of the Ohio Flora at The Ohio State University", National Science Foundation, 2009-2012.

Johnson, N.F. & A.D. Austin. "**PBI**: Diversity and the parasitoid life-history strategy — the superfamily Platygastroidea (Hymenoptera)", National Science Foundation DEB, ***$2,600,000.*** 2006–2011. (extended until August 2013).

Johnson, N.F. "Fine-grained semantic markup of descriptive data for knowledge applications in biodiversity domains". National Science Foundation, ***$50,490***. (OSU Subcontract). 2010–2012. (extended until 2013)

Molluscs Division. Aquatic Mollusks Inventory and Distribution, ODNR ODW, ***$47,517***. 2012-2013.

Molluscs Division. Freshwater Mussel Health Assessment, ODNR ODW, ***$32,087***, 2012-2013.

Molluscs Division. Aquatic Mollusks Conservation, Research & Surveys, ODNR ODW, ***$61,838***, 2012-2013.

Molluscs Division. Freshwater Mussel Health Assessment using Metabolomics, Columbus Zoo - OSU Cooperative Grant, ***$5,000***.

Nelson, D.A., **A. Poesel**, H.L. Gibbs, J.W. Olesik. "Digitization of recorded sounds in the Florida Museum of Natural History". National Science Foundation, DBI-0846354, REU Supplement. ***$5,998***. 2010 - 2012 (extended through July 2013).

Nelson, D.A., **A. Poesel**, D.W. Steadman, T.W. Webber. "Digitization of recorded sounds in the Florida Museum of Natural History." National Science Foundation, DBI-0846354. ***$466,581***. 2009 - 2012 (extended through July 2013).

OSU Herbarium. "National Science Foundation, "Digitization TCN Collaborative Research: North American Lichens and Bryophytes: Sensitive Indicators of Environmental Quality and Change". Collaborative with multiple PIs. Total funding: ***$4,198,841***. 2011-2015.

Wright, S.G. "Innate predispositions in the song learning of Black-capped and Carolina chickadees." American Ornithologists' Union, ***$2,411***.☘

Our heartfelt appreciation to all contributors!

Frequent Contributors: (in alphabetical order, by last name)

- Marc Kibbey, Associate Curator, Fish Division.
- Luciana Musetti, Curator, Triplehorn Insect Collection.
- Angelika Nelson, Curator, Borror Lab & Tetrapod Division.
- Mesfin Tadesse, Curator, Herbarium.
- G. Tom Watters, Curator, Division of Molluscs.

Other contributors in this issue: (in alphabetical order, by last name)

- Richard Bradley, Emeritus, Spider Collection.
- John M. Condit, Museum Volunteer.
- MaryMegan Daly, EEOB, Associate Professor, Director, Fish Division.
- John Freudenstein, EEOB, Professor, Director, Herbarium.
- Donald K. Gartman, Retired Research Biologist.
- Sandy Gaunt, Retired Curator, Borror Laboratory of Bioacoustics.
- Norman Johnson, EEOB, Professor, Director, Triplehorn Insect Collection.

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EVERYBODY EATS

MUSEUM OF BIOLOGICAL DIVERSITY
THE OHIO STATE UNIVERSITY

Don't miss!
Museum Open House
Saturday, February 9
10am-4pm.

Next issue of the MBDNewsletter coming up July 2013

We greatly enjoy hearing from our readers!
Please send your feedback to the Editor
at *osuc-curator@osu.edu*

ABOUT US

The **Museum of Biological Diversity** (MBD) is a research facility in the *Department of Evolution, Ecology and Organismal Biology, College Arts & Sciences, The Ohio State University*. The Museum houses all of the OSU's biological collections, except fossils. The main focus of the collections is the discovery, documentation and interpretation of biodiversity. The collections are an irreplaceable repository of specimens and information on the biodiversity of Ohio, the USA and the world. We provide extensive information about our holdings to the scientific community and to the general public through publications, websites and online databases.

The Museum is not regularly open to the public. Once a year, during our Annual Open House, we invite the community to tour our facilities and to interact with the faculty, staff and students. We host visits from classes taught at OSU and the individual units also welcome local school and community groups for guided tours by appointment. Links to the collections websites are available on the Museum website at ***mbd.osu.edu***.

Museum Address: 1315 Kinnear Road, Columbus, OH 43212-1157.

The **MBDNewsletter** is a publication featuring news and information on the collections at the **Museum of Biological Diversity**. The newsletter is produced by the Curators of the collections, with contributions from faculty, staff, students and associates of the collections. The **MBDNewsletter** is available **online** at ***mbd.odu.edu/newsletter***.