Department of Botany & the U.S. National Herbarium

The Plant Press

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National Museum of Natural History

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Botany Profile

Are You Experienced? Interning in Botany

By Gary A. Krupnick

Education plays a strong role in the Department of Botany. The Department's mission and vision statement includes the aspiration "to become an international center for the training of a new generation of botanical systematists, professional botanists and paraprofessionals." The resources available within the museum, including staff, herbarium specimens, living greenhouse specimens, and a molecular lab, make the Department an attractive place for students to further their training as young botanists.

There are several ways that students can gain botanical experience in the Department. Volunteering is one way. Volunteers contribute their time to the benefit of the Institution. While the service can be educational and of benefit to the volunteer, the activities are determined solely by the sponsoring staff with the aim of contributing to the needs of the Museum. A volunteer position is considered community service, not an academic appointment, and is not recorded as such on the volunteers resume or CV. The Visitor Information and Associates' Reception Center (VIARC) manages and administers all behind-the-scenes volunteer appointments Smithsonian-wide.

Internships are another way the Department actively engages students, providing hands-on education and training in research, collections management and even administration. Unlike volunteering, an internship is an academic appointment—a prearranged learning experience with both the intern and Institution benefiting from the endeavor. Internships have an element of educational training build into the appointment and this training complements the education and career goals of the intern. Internships at NMNH are administered centrally and officially recorded with the Smithsonian through the Center for Education and Museum Studies (SCEMS).

The Smithsonian is not a degree granting institution and therefore does not award academic credit. Interns can, however, receive academic credit from their university or college for their internships and many U.S. colleges and universities will recognize academic work performed while interning at the museum.

Internship appointments are generally at least six weeks in duration, although special week-long opportunities during Winter Break and Spring Break are often available. Students must be at least 16 years old to participate in an internship. The majority of students who serve an internship in the Department are from undergraduate colleges and universities, but high school students and graduate students have been appointed as interns as well.

Dating way back to the days when Botany was housed in the SI Castle and internships were an informal and unrecorded appointment, the Department has maintained a long tradition of educating students through internships. Many current and even retired Botany staff started as an intern in the Department. Over the past 30 years, the National Museum of Natural History has hosted more than 3,000 interns including many in Botany. The number of students serving an internship at the Museum has increased over time and grown exponentially over the past few years; sometimes even doubling from the previous year. In 2009 alone the Museum hosted 372 internships with 46 of these in Botany.

Interns have recently been involved in a broad range of projects: inventorying herbarium specimens, creating digital images of specimens, describing new species, managing databases of rare and endangered species, cataloguing historic collection maps, conducting laboratory research, and conducting field work in both terrestrial and marine locales.

One program that hosted several interns this past year was the Plant Conservation Unit (PCU). Headed by Gary Krupnick, PCU is currently involved in the preliminary conservation assessments of plant species. The Global Strategy for Plant Conservation (GSPC) calls for a preliminary assessment list of the conservation status of all known plant species by 2010. Unfortunately, only 4 percent of the world's flora has been assessed. A model developed by Krupnick, with W. John Kress and Warren Wagner, uses data from herbarium specimens to speed up the global assessment, identifying which plant species may be threatened and which species are common based upon the number, timing, and spacing of specimen collections. With the assistance of student interns, the plant specimen database of several plant families from the U.S. National Herbarium has been checked for accuracy. Using floras and checklists, interns have

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Travel

Pedro Acevedo traveled to Tabasco, Mexico (10/4 – 10/14) to teach a 25-hour course on lianas and climbing plants of the Neotropics at the Universidad Juarez Autonoma de Tabasco, visiting several localities and generally collecting lianas and trees of interest, especially in the family Sapindaceae.

Walter Adey traveled to Williamsburg, Virginia (10/22; 12/10) to attend meetings of the Chesapeake Algae Project; to Fayetteville, Arkansas and Kalamazoo, Michigan (11/2 – 11/6) to meet with colleagues at the University of Arkansas and the University of Western Michigan to discuss results of the ATS Energy Project; to Havre de Grace, Maryland (11/10) to meet with Constellation Energy and Exelon staff to discuss the location of an ATS pilot plant on Chesapeake Bay; and to Brooklyn, New York (11/15 – 11/16) to meet with the Army Corps of Engineers directorate on the Susquehanna River Basin Commission.

David Erickson traveled to Mexico City, Mexico (11/7 – 11/11) to give a presentation on applying DNA barcodes to forest trees of the Smithsonian Institution Global Earth Observatories (SIGEO) and the Center for Tropical Forest Science (CTFS) network at the 3rd International Conference on DNA barcoding hosted by the Consortium for the Barcode of Life (CBOL).

Robin Everly traveled to Seattle, Washington and to Chicago, Illinois (10/15 – 10/21) to attend a Council on Botanical and Horticultural Libraries board meeting and to visit the Field Museum and the Chicago Botanic Garden.

Christian Feuillet travelled to St. Louis, Missouri (11/17 – 11/26) to work on West Indian *Cordia* (Boraginaceae) and on *Dilkea* and *Passiflora* (Passifloraceae) at the Missouri Botanical Garden.

Vicki Funk traveled to Uruguay, Argentina, and Chile (11/24/09 – 1/10/10) to meet with fellow synantherologists and to conduct field work; two former Smithsonian post-doctoral fellows, J. Marurico Bonifacino (Montevideo; MVFA) and Gisela Sancho (La Plata, LP), organized the events and participated in the field work.

W. John Kress traveled to London, England (10/12 – 10/16) to give an invited presentation at the 250th Anniversary Celebration of the Royal Botanic Gardens, Kew; to Panama City, Panama (10/26 – 10/28) to present the Darwin Lecture at the Smithsonian Tropical Research Institute; to Denver, Colorado and Santa Fe, New Mexico (11/6 – 11/10) and to Birmingham, Alabama (11/18 – 11/19) as part of a book tour for *The Weeping Goldsmith* and *Botanica Magnifica*; and to São Paulo, Brazil (12/1 – 12/5) to participate in a special workshop on DNA barcoding and to give an invited lecture on plants.

Gary Krupnick traveled to Chicago, Illinois (9/30 – 10/3) to participate in the North American regional meeting of the Global Strategy for Plant Conservation and a workshop on Botanical Capacity Assessment, and to present a poster at the Janet Meakin Poor Research Symposium—Global Plant Conservation Science and Outreach at the Chicago Botanic Garden.

Mark and **Diane Littler** traveled to Ft. Pierce, Florida (12/25/09 – 2/19/10) to conduct on-going field research on the functional-form, biosystematics and comparative ecology of south Florida marine algae and seagrasses.

Paul Peterson traveled to Mexico City, Mexico (11/6 − 11/9) to attend a planning meeting for the Grass Barcoding of Life Project (GrassBoL); and to San Jose, Costa Rica (12/6 – 12/13) to give a semi-

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Web site: http://botany.si.edu/

Visitors

Blanca Leon, Universidad Nacional Mayor de San Marcos, Lima, Peru; Peruvian *Tillandsia* (Bromeliaceae) and flora (10/18/07-10/18/09).

Michael Martin, Johns Hopkins University; *Ambrosia* (Compositae) (1/1/09-6/30/10).

Zhumei Ren, Shanxi University, China; Gallnut aphid/host plant coevolution based on DNA sequences (2/1/09-1/31/10).

Pingting Chen, Central China Agricultural University; Vitaceae (3/1/09-2/28/10).

Virginia Valcacel, Universidad Pablo de Olavide, Spain; *Hedera* (Araliaceae) (4/19-10/20).

Qing Liu, South China Botanic Garden, Chinese Academy of Sciences, Guangzhou; Chloridoideae (Poaceae) (7/4/09-7/4/10).

Silvia Nicole, University of Padova, Italy; Plant DNA barcoding (7/10-10/31).

Christine Bacon, Colorado State University; Hawaiian *Pritchardia* (Arecaceae) (9/8-12/8).

Emily Forse, Georgetown University; Plant conservation internship (9/14-12/11).

Orlando Jara, Universidad Nacional de Colombia, Bogota; Colombian *Erythroxylum* (Erythroxylaceae) (9/17-10/18).

David Lorence, National Tropical Botanical Garden; Marquesas Islands flora (9/21-10/4).

Andrea Leon, Universidad Nacional de Colombia; Colombian ferns (Grammitidaceae) (9/28-10/25).

Food For Thought: 21st Century Perspectives on Ethnobotany

People are dependent upon plants for food, clothing, medicine, fuel and other necessities of life. Humans and plants have interacted as long as humans have existed, but our relationship is not static. Since the advent of agriculture we have exerted evolutionary pressure on plants that are of importance to us. Indigenous and industrialized societies have interacted with plants in their environments and influenced not only crop plants, but also cultural landscapes. The 2010 Smithsonian Botanical Symposium, hosted by the Departments of Botany and Anthropology, will examine a number of different ways in which the field of ethnobotany is being transformed in the 21st century.

The Symposium, to be held 24-25 September 2010 at the National Museum of Natural History in Washington, D.C., will include a day of invited speakers, who will cover a wide range of topics: from the role molecular biology now has in elucidating crop domestication to the ways in which peoples across myriad ecosystems interact with specific plants and landscapes. The Symposium is being sponsored by the National Museum of Natural History and the United States Botanic Garden.

The Symposium is one of many activities planned to help us celebrate the Centennial of the National Museum of Natural History. Participants in the Symposium, who are not regular visitors to the Museum, will be privileged to see a major new exhibition that opens 17 March 2010 and is dedicated to the understanding of human origins. Based on decades of cutting-edge research by Smithsonian scientists, the David H. Koch Hall of Human Origins will tell the epic story of human evolution and how this occurred over the course of six million years in response to a changing world.

In addition, the José Cuatrecasas Medal in Tropical Botany will be awarded at the Symposium. This prestigious award is presented annually to an international scholar who has contributed significantly to advancing the field of tropical botany. The award is named in honor of Dr. José Cuatrecasas, a pioneering botanist who spent many years working in the Department of Botany at the Smithsonian and devoted his career to plant exploration in tropical South America.

More information, including registration, will be available soon on the Department of Botany web page <http://botany.si.edu/>.

- **Laurence J. Dorr**, Guest contributor
  Research Botanist & Curator

Chair With A View

Warren L. Wagner

Amanda Saville, North Carolina State University; Bamboo library and *Dichanthelium* (Poaceae) (10/9).

Janelle Burke, Cornell University; Tropical Polygonaceae and Plumbaginaceae (10/13-10/14).

Cesar Castellanos, Universidad Industrial de Santander, Bucaramanga, Colombia; Colombian Fabaceae (10/19-10/23).

Taina Price, Duke University; *Talinum* (Portulacaceae) (10/20).

Nadia Roque, Universidade Federal da Bahia, Brazil; Asteraceae (10/20-11/6).

Benoît Loeuille, University of São Paulo, Brazil; *Eremanthus* (Compositae) (11/15-12/14).

Steven Torrey, Independent researcher; John Torrey papers and specimens (11/16).

Charles Zartman, Instituto Nacional de Pesquisas da Amazônia, Brazil; Humiriaceae (11/17-12/10).

Alina Freire-Fierro, Philadelphia Academy of Sciences; Colombian *Monnina* (Polygalaceae) (11/18).

Leigh Johnson, Brigham Young University; *Navarretia* and *Collomia* (Polemoniaceae) (11/18).

Alexey Zinovjev, Independent researcher; *Salix caprea* (Salicaceae) (11/18).

Volker Bremer, **Lisa Cherepon**, **Matthias Landthaler**, **Doris Linke**, and **Katharina Roeseler**, German Convention Bureau; Ethnobotany and medicinal plants (11/18).

Daniel Atha, New York Botanical Garden; *Persicaria* (Polygonaceae) (11/30-12/2).

Chun-Lin Huang, National Museum of Natural Science, Taiwan; DNA barcoding (11/30-12/24).

Grace Liu, University of West Georgia; Plant conservation internship (12/14-12/18).

Dana Gadeken, University of Mary Washington; Plant conservation internship (12/14/09-1/8/10).

Phil Dover, Babson College; Development of the Institute for the Preservation of Medical Traditions (12/15).

Marie Balboa, University of North Carolina; Plant conservation internship (12/21/09-1/8/10).

Siddharth Rajagopalan, University of Virginia; Plant conservation internship (12/21/09-1/15/10).

Staff Research & Activities

Rusty Russell was selected as one of seven featured scientists in the Coalition on the Public Understanding of Science (COPUS) Year of Science celebrating the theme "Biodiversity and Conservation," <http://www.yearofscience2009.org/themes_biodiversity_conservation/meet-scientists/>.

On 7 October, **Alice Tangerini** attended the opening of "Losing Paradise? Endangered Plants Here and Around the World" at the Missouri Botanical Garden in St. Louis, Missouri. Her drawing of *Mortoniodendron uxpanapense*, illustrating a new species for **Larry Dorr**, was featured in the exhibit along with 44 other paintings and drawings of endangered and threatened plants. The traveling show was curated by the American Society of Botanical Artists (ASBA) and developed in collaboration with the Smithsonian's National Museum of Natural History. Twelve of the participating artists attended the opening reception, featuring talks by Peter Raven, President of Missouri Botanical Garden, Kathryn Kennedy, President of the Center for Plant Conservation, and Carol Woodin, the ASBA Exhibit Chair. During her stay, Tangerini toured the Garden, viewed the Rare Book Room, visited staff offices, and met with archivist Doug Holland.

On 13-21October, Tangerini participated in the ASBA annual meeting held at the Desert Botanical Garden in Phoenix, Arizona. As a member of the ASBA Board of Directors, Tangerini attended a board meeting. She also taught a full day class in the technique of drawing on drafting film using polymer drafting pencils. The meeting included two exhibit openings: the Legacy Exhibit for board members and recipients of special awards, and the annual juried exhibit at the Phoenix Art Museum. Tangerini had drawings in both exhibits – *Ixora jourdaniensis* and *Hernandia nukuhivensis* at the Legacy, and *Erato costaricensis* in the Phoenix Museum.

Alice Tangerini (fourth from left) attended the opening of "Losing Paradise? Endangered Plants Here and Around the World" with other participating artists at the Missouri Botanical Garden in St. Louis, Missouri.

Staff Retirements

Maria Faust officially retired from the Smithsonian Institution in December. Faust, a specialist in dinoflagellates, joined the Department of Botany in 1987 after 14 years at the Smithsonian Environmental Research Center (SERC). Her research career has been dedicated to field and laboratory research to understand microbial interactions and biodiversity of

Maria Faust

dinoflagellate algae in tropical, marine, shallow water, mangrove and coral reef ecosystems, and to developing a premier U.S. Dinoflagellate Collection for research and teaching based on modern information technology. Faust received her B.S. in Plant Physiology from the Agricultural University, Budapest, Hungary, in 1951; her M.S. in Soil Microbiology from Rutgers University in 1962; and her Ph.D. in Microbial Physiology from the University of Maryland in 1970. Faust's efforts at the Smithsonian have expanded our knowledge of dinoflagellates considerably, especially in the geographical area from Florida to Belize. During her more than two decades here she amassed a valuable collection of beautiful and detailed SEM images of these complex and interesting organisms. Faust will continue working in the Department under the title Emeritus Microbiologist.

Ellen Farr retired from the Smithsonian Institution in December. A specialist in information management, Farr co-edited *Index Nominum Genericorum* (ING), developed specimen catalog databases, and published many web pages of Department research projects. Farr received her B.A. from Humboldt State College in 1963 and her M.S. from Virginia Polytechnic Institute and State University in 1974. That same year, Farr joined the Department of Botany at the National Museum of Natural History. Under Farr's expertise, the Department became a leader and major participant in the original Natural History Gopher server (1994) with the U.S. National Herbarium's 88,000-record Type

Specimen Register. Farr developed the museum's first visitor information and staff publications databases with end-user data entry forms and search and display functions. This resource was later adopted at the museum-level and the publications database has now migrated to the SI Libraries Research Bibliography. She created numerous database-driven web sites for research projects (checklists, species accounts, etc.) as well as specimen presentations. Many now include an internal interface for updating the information by members of the project team. Farr will continue working in the Department under the title Information Management Emeritus.

Awards & Grants

Diane Littler was selected for inclusion in the Women Divers Hall of Fame (WDHOF) Class of 2010. WDHOF is an international non-profit professional honor society whose member contributions span a wide variety of fields. Created in 1999, WDHOF's two-part mission is to (1) recognize women divers who have made outstanding contributions to the exploration, understanding, safety and enjoyment of our underwater world, and (2) support the underwater world and its associated careers by promoting opportunities for women and men in diving through scholarships, internships and mentorship opportunities, and a worldwide network of industry contacts. WDHOF members are the pioneers, leaders, innovators and world record holders throughout the international diving community.

Travel

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nar, "Una Filogenia de la Chloridoideae (Poaceae) Basados en Secuencias de ADN Plastidial y Nuclear," and to review the grass collections at the Museo Nacional de Costa Rica (CR) and Instituto Nacional de Biodiversidad (INB) herbaria.

Rusty Russell traveled to Ft. Worth, Texas (10/9 – 10/10) to discuss an extension of the former Philippine Plant Inventory with Botanical Research Institute of Texas Director Sy Sohmer and Collections Manager Amanda Neill; to Riverside, California (10/10 – 10/18) to continue Earthwatch Institute supported field work in the San Jacinto Mountains; and to Medellin, Colombia (11/29 – 12/5) to attend a partner meeting of the Global Plants Initiative and to visit the herbaria of the Medellin Botanical Garden (JAUM) and the University de Antioquia (HUA).

Alice Tangerini traveled to St. Louis, Missouri (10/6 – 10/9) to attend the opening of the exhibition "Losing Paradise? Endangered Plants Here and Around the World" at the Missouri Botanical Garden; and to Phoenix, Arizona (10/13 – 10/21) to participate in the American Society of Botanical Artists annual meeting held at the Desert Botanical Garden.

Alain Touwaide and **Emanuela Appetiti** traveled to Messina, Italy (10/15 – 10/29) to deliver a paper at the symposium Ancient Scientific Lexicology organized at the University of Messina, where Touwaide also presented a series of seminars and lectures; and to New York City (11/19 – 11/20) where Appetiti presented an invited lecture at the Arnold & Marie Schwartz College of Pharmacy and Health Sciences, Long Island University, Brooklyn Campus.

Warren Wagner traveled to St. Louis, Missouri (10/8) for the symposium Angiosperm Phylogeny and Biotic Evolution at the Missouri Botanical Garden; and to London, England (10/11 – 10/16) to attend the International Association for Plant Taxonomy meeting and the conference "Plant Conservation for the Next Decade: A Celebration of Kew's 250th Anniversary" at the Royal Botanic Gardens, Kew.

Jun Wen traveled to London, England (10/11 – 10/17) to attend the International Association for Plant Taxonomy council meeting at the Royal Botanic Gardens, Kew; to China (10/18 – 10/30) to give a talk on Darwin and biogeography at the Darwin 200 meeting in Peking University, and to work in the herbaria of Beijing Institute of Botany and Kunming Institute of Botany; and to Chicago, Illinois (12/16 – 12/27) to do herbarium work at the Field Museum.

Torrey Relatives Visit USNH

On 17 November 2009, **Mike**, **Steve**, and their mother **Margaret Torrey** visited the U.S. National Herbarium. They are related to the American botanist John Torrey (1796-1873), descended from one of his brothers. **Ken Wurdack** and **Larry Dorr** were delighted to show them specimens in our collection that were collected by their famous relative, including type specimens of plants collected in California in 1865.

Wurdack and Dorr explained to the visitors the influence of Torrey and his pupil Asa Gray (1810-1888) on systematic botany, including Torrey's adoption of a natural (as opposed to artificial) classification in his earliest published floras, Torrey and Gray's joint and partially successful attempt to write a flora of North America (*A Flora of North America*, 2 vols., 1838-1843) and its current multi-authored multi-volume on-going incarnation (*Flora of North America: North of Mexico*, 29 vols., 1993-x), Gray's advocacy of Darwin's theory of evolution, and Torrey's relationship to the Smithsonian Institution and its botanical collections. Mike, an architectural photographer, was in Washington, D.C., to speak at the National Museum of the American Indian (NMAI) about his new book, *Stone Offerings: Machu Picchu's Terraces of Enlightenment* (2009).

Botany Website Update

The Botanical Illustrations website <http://botany.si.edu/botart/> has recently been updated. About 935 plates have been scanned for the database. A new feature is the added capability of linking the illustration to the type specimen if the drawing is of a type, and linking back from the Type Register to the illustration.

The Plant Image Collection (PIC) website <http://botany.si.edu/PlantImages/> has been selected as a valuable educational resource by the education portal FUSE <https://fuse.education.vic.gov.au/>. FUSE is an Australian not-for-profit web portal managed by the Victorian Government's Department of Education and Early Childhood Development, and is designed to share quality educational resources across Australian schools.

The Biological Diversity of the Guiana Shield Program (BDG) website <http://botany.si.edu/bdg/specimenquery/query.cfm> has a new option for visitors to explore. It is now possible to search the plant collections by species, genus, or family as well as by collector.

The Smithsonian Institution's 2010 José Cuatrecasas Fellowship Award

The Smithsonian Institution's Department of Botany announces the Cuatrecasas Award. This annual competition will usually result in 1-2 awards, each one not to exceed $3,000 (US). The award is to support work in the spirit of the research of the late Dr. José Cuatrecasas, a long time associate of the U.S. National Herbarium. Priority will be given to scientists from Latin America or elsewhere who work on tropical plants. Funds are to be used to study specimens housed in the U.S. National Herbarium. Anyone interested in applying for the award should submit their curriculum vitae, a proposal and two letters of support; it is suggested, but not required, that one of the letters be from a scientist at the Smithsonian. Proposals should not exceed two pages in length and should include the following: Name and address of applicant, date submitted, specific objective of trip, overall research project, date of trip, budget. Complete applications should be sent via email, fax, or airmail to Dr. Pedro Acevedo at the address listed below. Email is preferred and you should receive a reply confirming that we have received your application. Applications should arrive no later than 30 April and applicants will be notified of the committee decision no later than 15 May.

Anyone wishing to make a contribution to the José Cuatrecasas Award Fund should send a check to the Chairman, Department of Botany, using the address:

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Recipients of the José Cuatrecasas Award Visit NMNH

José Cuatrecasas Travel Award Fellow **Orlando Adolfo Jara Muñoz**, from the Herbario Nacional Colombiano (COL),

Orlando Jara

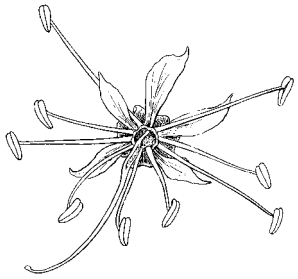
Bogotá, Colombia, spent four weeks from 17 September to 18 October, at the U.S. National Herbarium where he studied collections of *Erythroxylum* (Erythroxylaceae) from Colombia and neighboring countries in order to complete a taxonomic revision of the genus *Erythroxylum*. Jara registered 40 species of *Erythroxylum* and four varieties from Colombia. One important achievement during his visit was that he studied the holotype of *Erythroxylum acrobeles*, one of the five Colombian endemic species, collected only one time by J. Cuatrecasas in 1952 in the Pacific region of Colombia. Jara also studied collections of the *Erythroxylum macrophyllum* complex—a group of species with difficult taxonomy and very broad distribution. Muñoz is studying the morphological variation to discover how many species can be differentiated. Additionally, he found some specimens of a species that he is currently describing from northwest Peru. He also determined some specimens that had incorrect names or were only determined to genus level.

Dubán Canal Gallego, from the Universidad Nacional de Colombia, Bogotá, Colombia, visited the U.S. National Herbarium from 5 August to 10 September, to identify and evaluate Colombian species of *Cestrum* L., the second largest genus of Solanaceae, with about 180 species distributed in the Neotropics. In spite of the 250 year of history, the genus is still not well understood. The only available systematic treatment for the genus was published by Francey in 1935 and 1936, where he registered 257 species. Countries such as Brazil, Colombia and Ecuador only have preliminary checklist for the species of *Cestrum*. During his visit, Canal consulted about a hundred type specimens at the U.S. National Herbarium. As a result, he confirmed the taxonomical status of about 32 species present in Colombia. He placed five names into synonymy and confirmed the placement of 14 synonyms previously proposed by other workers. The study of Central and South American collections allowed him to confirm the taxonomic identity of 49 species of *Cestrum*, four of which turned out to be new to science for Colombia. In addition, Canal identified three new records of *Cestrum* for Colombia, as well as defining the distribution patterns and morphological variation of several species. As a result, he generated descriptions for 29 species and completed the descriptions of 16 other species. The Cuatrecasas fellowship allowed Canal to further understand the status of the Colombian species of *Cestrum* and to establish the basis for further studies of Andean species of the genus.

Benoît Francis Patrice Loeuille, from the Universidade de São Paulo, Brazil, visited the U.S. National Herbarium from 15 November to 14 December, to perform phylogenetic studies based on morphological and molecular characteristics of the subtribe Lychnophorinae (Asteraceae: Vernonieae) and of the genus *Eremanthus* Less., in order to understand the relationships between the genera of the Lychnophorinae and the rest of the tribe Vernonieae, as well as to clarify the circumscription of the genus. The subtribe Lychnophorinae, endemic to Brazil, contains 11 genera and ca. 110 species. Most species are restricted to campo rupestre areas of southeastern and northeastern Brazil and

Dubán Canal

to the cerrado. *Eremanthus*, a genus of ca. 20 species, is a typical element of the cerrado and campo rupestre. The U.S. collection contains nearly 1,000 specimens of Lychnophorinae. During his visit, Loueuille furnished distribution data for several taxa, discovered unidentified type material, and found a new species of the genus *Minasia*, which will be published in collaboration with Harold Robinson. Loueuille also studied several Vernonieae taxa for which no specimens are available in Brazil: *Critoniopsis huaricajana*, *Critoniopsis sodiroi*, *Distephanus polygalaefolia*, *Lepidonia jonesii*, *Stokesia laevis*, *Stramentopappus poolae*, *Strobocalyx arborea*, *Tarlmounia elliptica*, *Vernonia fasciculata* and *Vernonia noveboracensis*. For each taxon, 70 characters were analyzed to fill the morphological data matrix. The chloroplastic region *mat*K was sequenced for five Lychnophorinae taxa to detect the amount of variation in the sequences and the resulting usefulness for phylogenetic reconstruction. These sequences are currently being analyzed. The gathered data during Loueuille's visit helped solve several taxonomic problems, produced a broader phylogeny by including extra Brazilian taxa, and represented an important step in the understanding of the Lychnophorinae.



Vicki Funk receives the First Annual Secretary's Award for Excellence in Collaborative Spirit from Smithsonian Secretary Wayne Clough. (Photo by the Office of the Secretary)

Funk Receives Collaborative Spirit Award

Vicki Funk is the recipient of the First Annual Secretary's Award for Excellence in Collaborative Spirit. In October 2008, Funk was selected to serve as a Co-Chair of the Smithsonian Strategic Planning Steering Committee, a 24-member group appointed by the Secretary to provide guidance during the first-ever pan-Institutional strategic planning process.

Funk demonstrated a willingness to collaborate with others to develop a collective vision for the Smithsonian's future. She dedicated a tremendous amount of time and energy to this process, taking time out of her rigorous research schedule to personally meet with dozens of people outside of her regular circles to hear their views and ideas. Funk's most enduring contribution to the strategic plan was in the development of the "mission themes," the comprehensive, cross-cutting topics that span across disciplines and demonstrate how the whole of the Smithsonian is greater than the sum of its parts. She hosted weekly lunches with a rotating group of committee members and other assorted folks to develop and refine these ideas, and personally oversaw the drafting of dozens of versions of these themes which are now the centerpiece of the new strategic plan.

Funk held true to her belief that the future of the Smithsonian is dependent on an interdisciplinary, rather than insular, approach to scholarship. She showed a willingness to change her own opinions and embrace new perspectives, setting an example for how compromise can be reached in a way that still results in forward progress. This example of collaborative effort will serve as a model for how everyone can work together across units in the future to achieve common goals.

Funk's zealous commitment to the Smithsonian mission is embodied in her deep appreciation of nature and biodiversity and in her belief that through cross-unit partnership the Smithsonian can meet and overcome the grandest of challenges. Her love of the Institution is infectious and she has unbounded enthusiasm for this place and the great things it can do, all of which is evident in her work on the strategic plan, a document which will shape the future of the Smithsonian.

Biological Field Book Project Receives CLIR Funding

A collaboration between the United States National Herbarium and the Smithsonian Institution Archives has received a grant of $500K from the Council on Library Information Resources (CLIR). The purpose of this project is to develop a cataloging standard for an overlooked resource – original field books housed in the Smithsonian that document the collection of biological organisms. This metadata schema will be coordinated with the Natural Collections Description Group (NCD; http://www.tdwg.org/activities/ncd) and the Biodiversity Heritage Library (BHL; http://www.biodiversitylibrary.org/) and will provide a framework for cataloging the tens of thousands of original field books in the numerous science bureaus within the Smithsonian.

Representatives from major natural history organizations are participating in the development of this data standard which will result in an online Registry of field books to which any other repository of field books may contribute. This central Registry will also facilitate researchers' attempts to locate original field note books and original related material which sometimes can be distributed in multiple organizations, or even multiple locations within the same organization.

As an example, the many thousands of biological field books at the Smithsonian are maintained in no fewer than 22 different offices, programs, departments, research stations and museums, not to mention those that are controlled by the library and archives units. Over the years, our experience in the U.S. National Herbarium suggests that there is a tremendous need for access to field book data.

Biology relies on the original literature and original sources of species information more than any other science discipline. Critical among these resources are the personal field books, journals and notes of the collectors of plant and animal species, as well as the actual specimens acquired. The development of finding aids and digitization of the latter has been underway for decades. However, what should be the simple task of locating an original journal or field book can be a lengthy and frustrating exercise.

In the same manner in which biological specimens are the original source for information related to species, so too are these field books, journals, notes and sketches the original source for information related to the events during which biological specimens were acquired. Scholars, therefore, invest greater intellectual value in these materials than anything that has been subsequently interpreted or transcribed.

In their attempt to better understand the increasingly important issues surrounding global biodiversity, taxonomists are more frequently revisiting these original sources in order to resolve species delimitations and analyze change over time. Science historians are accessing these materials to reconstruct and more accurately report the events surrounding scientific discovery. Public and private land managers are using the information obtained from original accounts of the landscape to design strategies for habitat reconstruction, and set-asides for preservation and recreation. Managers of systematics collections are using the more detailed locality descriptions in personal journals to accurately resolve the precise collecting location of plant and animal specimens in their care. Ecologists are retrieving the original records of field work, which oftentimes includes data not present on specimen labels, to help them integrate species information into their analytical models.

Original source documents are so fundamental to our understanding and appreciation of exploration and discovery within biology, that we expect a project to identify, expose and deliver these materials will be met with great interest and enthusiastic involvement by other repositories of similar objects.

For more information, contact Rusty Russell at russellr@si.edu.

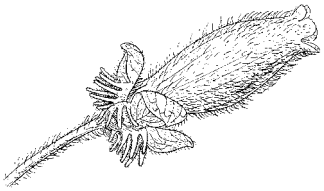
Bat Pollination in Review

A new invited review paper, just published in the *Annals of Botany* by Ted Fleming, Cullen Geiselman, and **W. John Kress**, provides a new perspective on the ecology and evolution of the pollination of flowers by bats. Fleming, a specialist on bat pollination and dispersal; Geiselman, a graduate student in plant systematic at the New York Botanical Garden; and Kress summarize the literature and synthesize new insights into the evolution of flower visiting by bats using a phylogenetic approach. This paper is a prelude to a forthcoming book by Fleming and Kress (in preparation) entitled *The Ornaments of Life – Ecology, Evolution, and Conservation of Tropical Nectar- and Fruit-eating Vertebrates and their Food Plants* to be published by University of Chicago Press.

Nectar-feeding bat *Glossophaga soricina* visiting flowers of *Mabea occidentalis* (Euphorbiaceae). (Photo by Merlin D. Tuttle, Bat Conservation International)

Celebrating 100 Years at the National Museum of Natural History

The Natural History Building first opened its doors to the public on 17 March 1910. The Museum will celebrate its 100th birthday with a special exhibition featuring archival and modern photographs highlighting many facets of this building—its people, collections, exhibitions, and outreach throughout the years. Photographs both old and new will give snapshots of life and work at the Museum over the past 100 years. The staff, research associates, contractors, volunteers, fellows, and visitors of the Department of Botany came together in January to celebrate the centennial with a group picture. Two previous staff photographs appear here. On the following page is the 2010 Botany photograph, taken by Smithsonian photographer, Chip Clark.



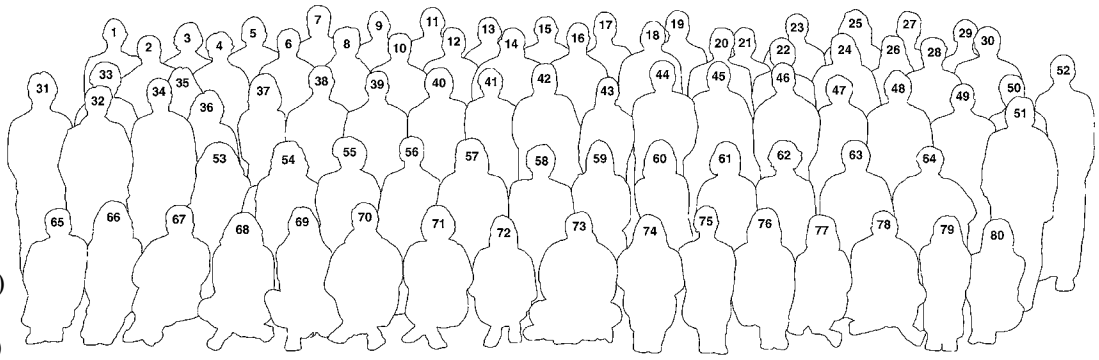
1965

12 December 1990

The Department of Botany

1. Jamie Whitacre (contractor)
2. Eduardo Garcia Milagros (contractor)
3. Hilary Cochard (volunteer)
4. Vicki Funk (staff)
5. Stephen Smith (staff)
6. Warren Wagner (staff)
7. Gregory McKee (staff)
8. Laurence Dorr (staff)
9. Paul Peterson (staff)
10. Robert Soreng (research associate)
11. Barrett Brooks (staff)
12. Walter Adey (staff)
13. Laurence Skog (emeritus scientist)
14. Christian Feuillet (research associate)
15. Dan Nicolson (emeritus scientist)
16. Rusty Russell (staff)
17. Robert Ireland (research associate)
18. Dieter Wasshausen (emeritus scientist)
19. Kenneth Wurdack (staff)
20. W. John Kress (staff)
21. Robert Faden (staff)
22. Stanwyn Shetler (emeritus scientist)
23. Stanley Yankowski (staff)
24. Chris Tuccinardi (staff)
25. Jim Harle (volunteer)
26. Katherine Rankin (staff)
27. William Cavan Allen (contractor)
28. Pedro Acevedo (staff)
29. J. Mauricio Bonifacino (visiting scientist)
30. Jim Estes (visiting scientist)
31. Weidong Zhu (visiting scientist)
32. Mary Ann Apicelli (staff)
33. Roz Elliott (volunteer)
34. Jane Reich (volunteer)
35. Linda Hollenberg (staff)
36. Deborah Bell (staff)
37. Leslie Brothers (staff)
38. Alain Touwaide (staff)
39. Gary Krupnick (staff)
40. Jun Wen (staff)
41. Susan Rechen (staff)
42. James Norris (staff)
43. Carol Kelloff (staff)
44. Mark Strong (staff)
45. Robert Sims (staff)
46. Andrew Clark (staff)
47. Natalya Crump (term appointment)
48. Mike Bordelon (staff)
49. Aaron Goldberg (research associate)
50. Lynn Russo (volunteer)
51. Florence “Pat” Jones (contractor)
52. Jimmy Triplett (post-doctoral fellow)
53. Emanuela Appetiti (staff)
54. Sue Lutz (staff)
55. Sylvia Orli (staff)
56. Ellen Farr (emeritus scientist)
57. Elaine Haug (staff)
58. Maria Faust (emeritus scientist)
59. Shruti Dube (term appointment)
60. Rose Gulledge (staff)
61. Ida Lopez (staff)
62. Alice Tangerini (staff)

21 January 2010



63. Patricia Davis (staff)
64. Margaret Gardner (staff)
65. Rong Li (post-doctoral fellow)
66. Jianying Xiang (post-doctoral fellow)
67. Neal Berg (volunteer)
68. Robin Everly (staff)
69. Sara Alexander (contractor)
70. Haywood Dail Laughinghouse (contractor)
71. Carla Miller (contractor)
72. Fiona Wilkinson (contractor)
73. Jennifer Hill (contractor)
74. Jenny Datiles (intern)
75. Sabrina Crane (contractor)
76. Patricia Groome (contractor)
77. Ingrid Pol-yin Lin (contractor)
78. Jim Short (volunteer)
79. Celia Chen (visiting scientist)
80. Zhumei Ren (visiting scientist)

Not Present

- John Boggan (staff)
- Jay Bolin (post-doctoral fellow)
- Sarah "Sally" Eichhorn (staff)
- David Erickson (research associate)
- Bernadette Gibbons (staff)
- Vinita Gowda (contractor)
- James Horn (post-doctoral fellow)
- Gabriel Johnson (staff)
- Anurita Krishnan (contractor)
- Daniel Layton (contractor)
- Qing Lin (visiting scientist)
- Diane Littler (research associate)
- Mark Littler (staff)
- Shirley Maina (staff)
- Silvana Martén-Rodríguez (post-doctoral fellow)
- Harold Robinson (staff)
- Elizabeth Zimmer (staff)

Adventures in Patagonia

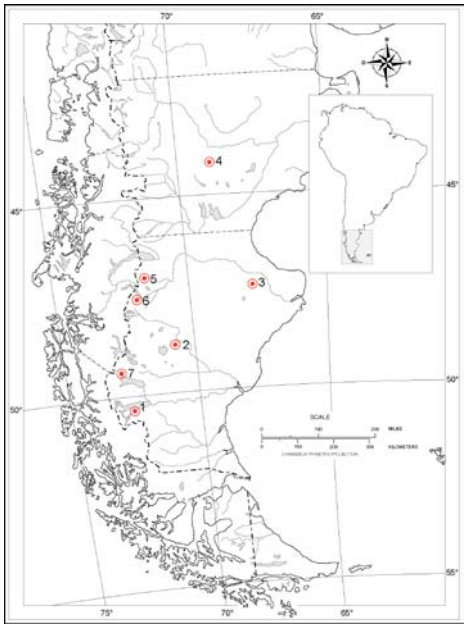
In December 2009 and January 2010, **Vicki Funk** and two former postdoctoral fellows, J. Mauricio Bonifacino (MVFA) and Gisela Sancho (LP), participated in a three-day conference and conducted field work in South America. The conference had two parts: a public symposium, *Systematics, Evolution and Biogeography of the Compositae*, and a small meeting for Compositae scientists. The conference was hosted by the Facultad de Agronomía in Montevideo, Uruguay, thanks to the generous support of Facultad de Agronomía, Comisión Sectorial de Investigación Científica de Uruguay (CSIC), Programa de Desarrollo de Ciencias Básicas (PEDECIBA), and the Smithsonian Institution.

At the public symposium, Funk, Bonifacino, and Sancho were among those who presented talks. In the afternoon meetings, there were discussions of the ongoing project on the systematics of Gochnatieae, a critical basal lineage in the Compositae. On the final day they went for a field trip to the southern end of Cuchilla Grande hill range in southern Uruguay where they observed and collected several strict and regional endemic species such as *Schlechtendalia luzulifolia* Less.

After the conference in Montevideo, Funk, Sancho and Bonifacino went on an extended botanical expedition to Patagonia in Argentina. They took the ferry to Buenos Aires and flew to El Calafate where they started a journey that took them through more than 3000 km of rugged terrain. About half the time they traveled through the Patagonian steppe and then alongside the jagged peaks of the southern Andes.

An extended 3-year drought was in place along the steppe; the drought and and an unusually cold and late spring made the collecting spots fewer and harder to find. Notwithstanding these weather-related challenges, more than 100 collections of Compositae were obtained. These collections served primarily as an updated input to the ongoing project for a revisited *Flora Patagonica*, and will also foster further advance on the understanding of the basal lineages of the Compositae and provide modern collections with molecular material for many important taxa.

First in a series of rewarding collecting spots was a sunken crater in the middle of a plateau northeast from Cardiel Lake in Santa Cruz, Argentina. Among several interesting collections there was a species of *Nastanthus* (Calyceraceae) which was rather prolific on the upper rim of the crater. Bonifacino found this location using Google Earth and it is definitely a place



Map showing locations corresponding with collecting sites. 1) El Calafate; 2) Sunken crater northeast from Cardiel Lake; 3) Estancia Sierras Blancas; 4) Chubut; 5) Between Los Antiguos and Paso Roballos; 6) Between Lago Pueyrredon and Chile; 7) Los Glaciares National Park.

that everyone agreed should be investigated further.

Second, in northeast Santa Cruz, in Estancia Sierras Blancas, they found an area dominated by rather dramatic white sandstone formations and several collections where obtained.

Third, after many stops without results the collectors were please to find *Eriachaenium magellanicum* Sch. Bip. The small muddy lake alongside route 24 in Chubut produced the first collection of this monotypic genus which has not been sequenced. The species, with fleshy, shiny, dark green leaves and minute heads, grows totally appressed to the ground. Shortly after this collection Sancho had to return home and Funk and Bonifacino continued to western Patagonia.

Fourth, along the border with Chile between Los Antiguos and Paso Roballos (on a road not yet open for the season) they found a rocky outcrop that was a veritable rock garden of interesting plants all small and appressed to the ground, including *Nassauvia* (Compositae), Violaceae, Calyceraceae, and Valerianaceae.

Fifth, at the end of a very bad road between Lago Pueyrredon and Chile, among a vast area dominated by *Mulinum*

Speakers at the conference during a fieldtrip to southern end of Cuchilla Grande hill range in southern Uruguay (Standing, from left to right: Gisela Sancho, Liliana Katinas, and Vicki Funk; kneeling, Nadia Roque and J. Mauricio Bonifacino.

***Nassauvia* sp., Santa Cruz, Argentina.**

J. Mauricio Bonifacino and Vicki Funk in Los Glaciares Nacional Park with Laguna Capri and Cerro Fitz Roy on the background.

spinosum (Apiaceae), they found another Compositae "garden" with *Hypochaeris, Erigeron, Perezia*, two species of *Leucheria* along with *Quinchemalium* of the Santalaceae and Calyceraceae.

Finally, at Los Glaciares National Park near Cerro Fitz Roy, along and above the Rio Blanco, several climbs up the steep slopes produced all three species of *Naussavia* that were known from the park. Before leaving the Fitz Roy area, Funk and Bonifacino each gave presentations to a group of park rangers. In El Calafate they mailed all of their collections to Sancho in La Plata.

On 19 December, having successfully completed the first two parts of the expedition, Bonifacino flew home. Funk flew to Bariloche , where she met with Cecilia Ezcurra (BCRU), the Director of the Herbarium at Universidad Nacional del Comahue. Ezcurra loaned Funk a plant press and offered to mail any additional collections to LP. Also in Bariloche was Jim Nix, Funk's husband, who was fly fishing. Funk collected east of Bariloche and near Junin de Los Andes. On 1 January, Funk and Nix took a bus to Esquel and then a driver took them to near La Junta, Chile where Funk collected in the temperate wet forests of Chilean Patagonia. Although Funk was on leave while in Chile, she could not refrain from making a few collections of interesting plants.

The U.S. National Herbarium has around 500,000 sheets of Compositae with a strong representation from the western hemisphere, but there are few collections from Patagonia so the results of these trips will be a welcome addition.

***Nastanthus* sp. (Calyceraceae) at the upper rim of a crater, Santa Cruz, Argentina.**

***Eriachaenium magellanicum* Sch. Bip., central Chubut, Argentina.**

Focus on Research Associates

There is No Moss on This Rolling Stone! Robert R. Ireland Curates the US Bryophyte Herbarium

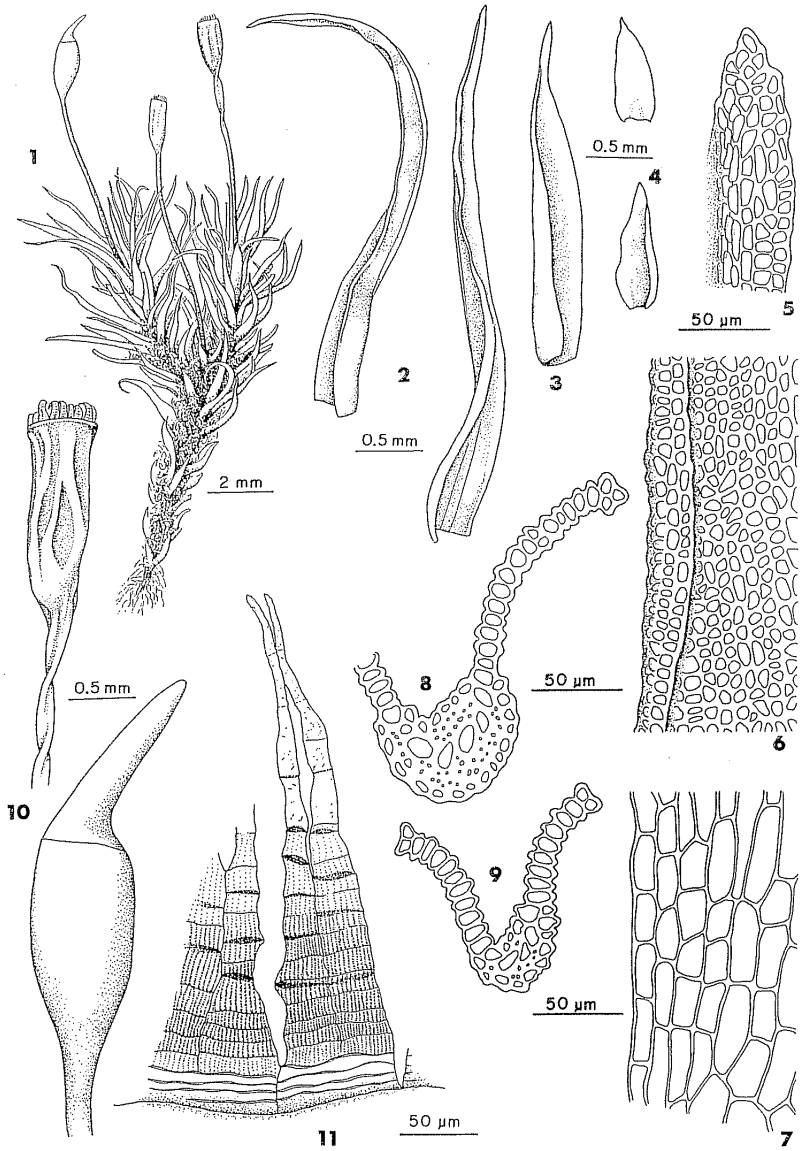
By Vicki A. Funk

Robert R. Ireland was born in the small town of Kingman, Kansas in 1932 but soon left with his parents to be raised and educated in several other larger towns in Kansas. His parents eventually moved to Topeka, the capital of Kansas, which is near the University of Kansas where Ireland graduated from high school. He received his B.A. (1956) and M.A. (1957) from the University of Kansas majoring in Botany, probably because his middle name is Root, which was his grandmother's maiden name. He studied vascular plants at the university, with his thesis being on a biosystematics study of two Kansas species of the genus *Erythronium* (Liliaceae).

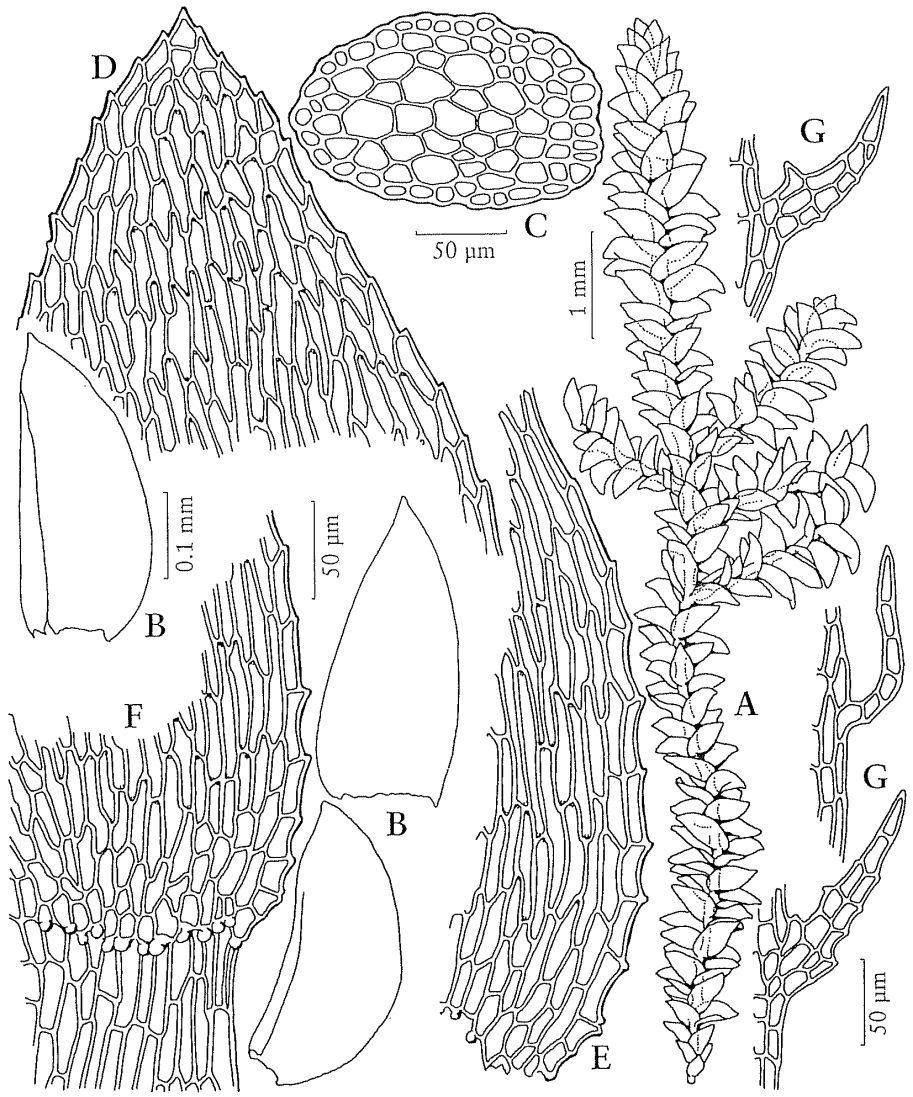
Shortly before Ireland's graduation in 1957, Conrad V. Morton sent a letter to the Botany Department of the University of Kansas saying that he wanted someone to come to the Smithsonian to learn the bryophytes. Ireland decided to switch botanical fields. He then started his career at the Smithsonian in the summer of 1957 by accepting the position as an Herbarium Aid in Cryptogams where he worked in one of the towers of the old sandstone Smithsonian Castle Building with the lichenologist Mason E. Hale. A year later he became an Assistant Curator of Bryophytes. Since there was no one at the Smithsonian to teach him the bryophytes, he learned them on his own from books and herbarium specimens. He also did field work to collect bryophytes mostly in the Shenandoah National Park, the Dismal Swamp region in southern Virginia, Ice Mountain in West Virginia and Roan Mountain in North Carolina. He sent the specimens he identified for verification as well as those that he could not identify to other well known bryologists, especially Howard Crum at the University of Michigan. Ireland soon decided that he preferred the mosses to the other two groups of bryophytes, namely the hornworts and the liverworts.

Ireland attended the University of Michigan Biological Station (known as the "Bug Camp") in the summer of 1961, where A.J. Sharp (University of Tennessee) was teaching the bryophytes. It was here that he learned to recognize many of the common mosses in the field. While he was attending the Biological Station, Elva Lawton, a specialist on mosses at the University of Washington in Seattle, wrote to Jack Sharp that she had just received a National Science Foundation grant to write a book on the Moss Flora of the Pacific Northwest and needed a student Research Assistant to help her with the work. Ireland left the Smithsonian and accepted the research position since he had always wanted to see Pacific Northwest and the numerous interesting mosses that occurred there.

As a Research Assistant Ireland collected mosses, mainly in Washington, Oregon, Idaho, Montana and British Columbia; made pencil drawings for the artists to ink of numerous mosses for the flora; and did many chromosome counts of mosses in the region. He received his Ph.D. in 1966 with a thesis entitled, *A Taxonomic Revision of the Genus* Plagiothecium *in North America, North of Mexico*. Upon graduation he was offered a position at the National Museum of Natural Sciences (now known as the Canadian Museum of Nature) in Ottawa, Ontario where he served from 1966-1994, first as the Curator of Bryophytes (1966-1991)



Ireland, R.R. 1985. A new species of *Cynodontium* from Mexico. *The Bryologist* 88(4): 372-373.



Ireland, R.R. 2004. *Dacryophyllum falcifolium*, a new North American genus and species (Musci: Hypnaceae) from California. *Novon* 14(1): 70-74.

and then as Research Scientist of Bryophytes (1991-1994).

During his research in Canada, Ireland worked mainly in the Maritime provinces of New Brunswick, Nova Scotia and Prince Edward Island; he eventually published a book on the moss flora of the region in 1982. While in Canada he also published 1) *Checklist of the Mosses of Canada* (1980, revised in 1987), with four other bryologists; 2) an *Illustrated Guide to Some Hornworts, Liverworts and Mosses of Eastern Canada*, with a student bryologist; 3) a number of meiotic chromosome counts of mosses; and 4) SEM studies on the morphology of spores of species in three genera of mosses.

Besides collecting several years in the Maritime provinces for his book, Ireland also collected in the Arctic on Bathurst Island where the Canadian Museum of Nature had a field station; in the subarctic region of Quebec along the western coast of the Hudson Bay; in many regions of Ontario; and in the northern part of British Columbia, accessible only by sea planes. In 1994 his position was terminated after the Canadian Museum of Nature had financial problems and 34 employees, including eight scientists, were released.

Ireland has two sons, the oldest is a civil engineer and the youngest is a computer software designer. Both live in Ottawa, Canada. Ireland's wife of 39 years passed away in 1996. In 1998 Ireland decided to move back to northern Virginia to escape the cold weather of Canada and also be near his oldest son who was working in Virginia at the time. In 1999 Ireland returned to his bryological origins and became a Research Associate in the Department of Botany at the National Museum of Natural History.

Over the past ten years, Ireland has continued his studies on the mosses at the U.S. National Herbarium, sometimes working with **Harold Robinson** on a few publications. He also traveled to the Missouri Botanical Garden for a couple of months for several summers to study their moss collections and work with the bryologists there. In 2001 he received a National Geographic Research Grant (NGRG) to study the moss flora of the Bío-Bío Region in south-central Chile. The following year he received another NGRG to continue his study of the mosses in this large and interesting region. During the two expeditions, over 6,000 specimens of mosses were collected, including duplicate specimens which he has supplied the Smithsonian for exchange with other institutions. Ireland is still identifying many of the specimens, as well as trying to find specialists in some difficult families of mosses to assist him with naming those in their field of expertise.

In addition to his present interest in the mosses of Chile, he has authored or coauthored treatments of two families and several genera of mosses in the book *Moss Flora of Mexico* (Sharp, Crum and Eckel; 1994) and is currently publishing several genera and families in the Bryophytes: Mosses, parts 1 and 2, of the *Flora of North America* series. His main interest has always been in the pleurocarpous, or

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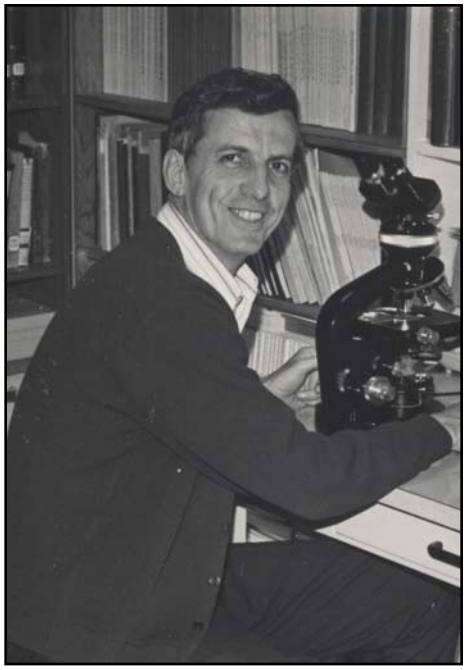

Robert Ireland at age 40 at work in the herbarium at the Canadian Museum of Nature in 1972.

Ireland

Continued from page 15

prostrate mosses, of the families Plagiotheciaceae and Hypnaceae, in addition to his interest in the acrocarpous, or erect mosses, of the family Dicranaceae.

His outside interests are travelling to different countries, watching sports (he also coached little league baseball in Canada for 25 years) and collecting stamps, both U.S. and Canadian.

He hopes to continue working at the Smithsonian, mainly in the winter, and spend part of his time in Canada during their summer. Certainly his efforts in curating our somewhat neglected Bryophyte collection here at the U.S. National Herbarium are most appreciated and we hope to see him around in the winters for some time to come.

A Medieval Book for a Healthy Life

Among its many treasures, the Bibliothèque de France in Paris holds a great many medieval herbals and medical books splendidly illustrated. One of these is the manuscript *latinus* 9333, which has been reproduced in facsimile with a volume of study by the Spanish publisher Moleiro. In the volume of study, **Alain Touwaide** has contributed three chapters in which he highlights the history, importance, and originality of this manuscript.

Latinus 9333 is a copy of the so-called *Tacuinum sanitatis*. It is the Latin translation of a treatise originally written in Arabic by the 11th-century physician ibn Butlan that deals with the factors influencing human health – from the air, the environment, and food, to physical exercise and sexual activity. In contrast to the Arabic original, several copies of the Latin version are illustrated. Characteristically, these illustrated *Tacuinum sanitatis* come from northern Italy and date to the 14th century. Their illustrations are not just scientific representations of the plants and other substances used as medicines; instead, they include all the factors that influence health. For all the subjects, the images represent all the elements in their context, thus offering a series of snapshots of medieval daily environment, life, and activities.

Such images constitute a source of particular importance for the history of botanical knowledge and illustration. Plants are not only represented in great detail, but also inserted into their environment, be it natural or human. Many of these representations include human figures, which illustrate the way plants were collected, treated, used, or loaded with cultural meanings. They constitute a material of great interest for a study of the interaction between men and plants.

As Touwaide shows, the manuscript encapsulates a knowledge and wisdom gained by trial and error over centuries, often going back to a much earlier period. The archeology of its text brings to light the odyssey of medicine and science in the Mediterranean area and beyond, as *latinus* 9333 moved from Italy further north, where its Latin text was translated into German.

The manuscript of Paris, Bibliothe`que nationale de France, *latinus* 9333: f. 36 verso: *Ocimum basilicum* L.; and f. 37 recto: *Mandragora officinarum* L.

Profile

Continued from page 1

been assisting in identifying synonymy problems and resolving gaps in specimen data records, such as identifying missing geographic data at the state, province, and island level.

Further, of the approximately 5 million specimens in the collection at the U.S. National Herbarium, roughly 1 million specimens (20%) have been inventoried. Interns are helping to build the database by inventorying specimens from targeted plant families (e.g., Fabaceae and Poaceae) and geographic regions (e.g., the West Indies) for conservation assessments.

The Collections Management, headed by Rusty Russell, hosted the most interns this past year, focusing on projects ranging from the plant image collection to organizing the historic map collection. The Plant Image Collection project is a continuation of the longstanding work to build and make available tens of thousands of plant images on the Botany website. In 2010, in addition to adding images from Mary Stensvold (U.S. Forest Service), the West Virginia University herbarium, and other donated collections, Russell and his interns plan to conserve the Soderstrom slide collection, archive backup images, and upload selected images to both the Encyclopedia of Life (EOL) and Smithsonian Flickr sites.

Another project focuses on the botany of the United States Exploring Expedition: 1838-1842. In the U.S. National Herbarium there are potentially 10,000 U.S. Exploring Expedition specimens from around the world. It is estimated that a total of 50,000 botanical specimens exist at a variety of herbaria across the country and around the globe. A comprehensive narrative discussing the Botany of the U.S. Exploring Expedition has not yet been done. This project focuses on the botanical story of the expedition from its historical and scientific perspectives. The project's goals include enumerating the entire collection, conserving each specimen, and producing a web presentation that integrates specimens and historical documents, such as publications, correspondence, manuscripts, field notes, and journal entries, into a precise resource on the Botany of the U.S. Exploring Expedition. Interns have been working in the herbarium to extract specimens collected on the U.S. Exploring Expedition as well

as conducting research online, and in libraries and archives to resolve gaps in the specimen data record. Additionally, interns have been managing the growing Wilkes collection and transcribing historical documents.

Russell also leads a study to examine the floristic changes in the Santa Rosa/San Jacinto National Monument. The Department of Botany has a cooperative project between the U.S. National Herbarium, the Riverside Municipal Museum, the University of Redlands and the University of California-Riverside mapping changes in the flora of the Santa Rosa/San Jacinto National Monument area in Riverside County using thousands of historic specimen records and modern botanical collections. Interns have been assembling herbarium specimens from this locality and collecting data in electronic form. Digital images have been created. Most importantly, interns have been translating the general locality information in geo-reference points in order for it to be interpretable by GIS. Information obtained from this project will contribute to improved public education as well as to decisions made by the Bureau of Land Management regarding designation of certain land in the area of the National Monument.

Beyond herbarium work, the Department has hosted interns in a laboratory setting and in the field. Liz Zimmer has had interns isolate plant DNAs from various forms of tissue samples, check the amount and integrity of the DNAs and amplify and sequence DNAs with specific barcoding gene primers. Bob Faden hosted interns who learned about plant anatomy and microtechnique using living plants grown in the Botany Department Research Greenhouse. The techniques used include paraffin-embedded sections, whole leaf clearings, epidermal scrapes, and scanning electron microscopy. Other researchers in Botany, such as Pedro Acevedo, Laurence Dorr, Vicki Funk, John Kress, Mark Littler, James Norris, Paul Peterson, Harold Robinson, Laurence Skog, and Warren Wagner have hosted interns in an organized 10-week hypothesis-driven, in-residence summer research and study curriculum for undergraduate students.

For the ultimate botanical experience, interns have participated in field research. Over the past six years, through funding from Smith College, Kress and his graduate student Vinita Gowda have mentored

Gary Krupnick (R) and his Plant Conservation Unit winter-break interns (L-R): Dana Gadeken, Marie Balboa, Siddharth Rajagopalan, and Eleanor Moran. (Photo by Elaine Haug)

interns in the Eastern Caribbean islands, where they have an on-going investigation on the relationship between the genus *Heliconia* and their hummingbird pollinators. The students learned how to set up an ecological study, record observations, dissect flowers, and collect and analyze nectar. Mark and Diane Littler have mentored interns in the Bahamas, where they taught methods of SCUBA-based field collecting and pressing techniques for various algal species, plus molecular, preservation and identification techniques.

Many interns have presented their Smithsonian internship research at scientific meetings and conferences. For instance, Laura Lagomarsino, an undergraduate student from the University of California – Berkeley, now in the graduate program at Harvard University, presented an oral paper, "Phylogeny and Floral Evolution of *Heliconia* section *Heliconia*," at the joint Botany and Mycology 2009 Societies meetings held in Snowbird, Utah, this past July. Like Lagomarsino, many interns have gone on to graduate school to further their education in botany. Several interns who have completed their doctorates are now Research Associates in the department and are active collaborators with Botany staff, such as Chris Hardy who interned with Faden in 1994 and 1995, and Jeffery Saarela who interned with Paul Peterson in 2001.

Below is a partial list of the 2009 interns hosted by the Department of Botany (listed by supervisor and project).

W. John Kress

Evolutionary history of *Heliconia*

- Laura Lagomarsino, University of California, Berkeley

Isolation and barcoding plant DNA samples

- Tarja de Soysa, Smith College
- Nandita Fernandes, St. George's University
- Silvia Nicole, University of Padona
- Ci Xiuqin, Chinese Academy of Science
- Zhang Yongjians, China Agricultural University
- Zhuo Zhang, University of Michigan

Molecular phylogeny of the Strelitziaceae

- Cary Pirone, Florida International University

Gary Krupnick

Conservation assessment of plant species

- Marie Balboa, University of North Carolina Chapel Hill

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- Kelsey Brooks, Princeton University
- Hannah Brown, Averett University
- Emily Forse, Georgetown University
- Dana Gadeken, University of Mary Washington
- Joo Hyun Lee, George Washington University
- Grace Liu, University of West Georgia
- Melissa Marshall, Smith College
- Eleanor Moran, University of Virginia
- Mayda Nathan, Dartmouth College
- Siddharth Rajagopalan, University of Virginia
- Ashley Sullivan, American University
- Linda Yi, Towson University

Mark Littler

Collecting expedition in Bahamas
- Kristal Ambrose, Caribbean Marine Research Center
- Caitlin O'Brian, Caribbean Marine Research Center
- Jean Pearson, Caribbean Marine Research Center

Rusty Russell

Arizona flora
- Sarah Molinari, College of William and Mary
- Alice Zicht, Oberlin College

Biological field books
- Claire Grunes, Winston Churchill High School

Botany of the United States Exploring Expedition: 1838-1842
- Lorah Patterson, Western Michigan University
- Caroline Young, Kenyon College

Catalogue of Botany maps
- Sarah Beaver, Appalachian State University
- Jarrod Fredericks, Florida State University
- Kaylin Gaal, College of Wooster
- Eamonn Hayes, University of North Carolina, Greensboro
- Jasper Holleman, Christelyk Lyceum Zeist High School
- Kyle Lincoln, Kalamazoo College
- Paige Looney, University of Georgia
- Amanda Manahan, Heidelberg University
- Hitesh Pant, American University
- Alex Peimer, State University of New York, New Paltz
- James Shoemaker, Kalamazoo College
- Chutimon Sindhuprama, University of Michigan
- Amanda Swango, University of North Carolina, Chapel Hill

Filing plant specimens
- Eric Caine, Phillips Exeter Academy High School
- Michael Ely, Winston Churchill High School

Floristic changes in the Santa Rosa/San Jacinto National Monument
- Steven Chong, San Jose State University
- Julie Szymakzek, American University

Linguistic analysis of ethnobotanical data from herbarium collections
- Aaron Freeman, University of Maryland

Plant Image Collection
- Genna Fleming, University of Maryland

Liz Zimmer

Isolation and barcoding plant DNA samples
- Reilley Keane, The Potomac High School
- Elizabeth Lyons, George Washington University
- Lara Mittereder, George Mason University
- Shannon Peters, Michigan State University
- Angela Turner, Virginia Tech
- Radhika Wikramanayake, George Washington University

Educational experiences offered to the interns can often go beyond the assigned tasks and duties. The Museum also provides a suite of behind-the-scenes tours, lunch discussions and even special lectures for interns to participate in. In addition, students can explore the sights of DC and join special activities arranged just for students participating in Smithsonian academic appointments. This past summer, a Smithsonian-wide Museum Careers Seminar Series featured topics such as career planning, choosing a graduate school, and filling out a government job application.

Registered interns have also enjoyed other benefits. They have received discounts at the Smithsonian's gift shops and one free IMAX ticket each week. They have also received discounts at the National Gallery gift shops and eateries and in the winter discounts on skating and equipment rental at the National Gallery Sculpture Garden Ice Skating Rink, located next to the Natural History Museum.

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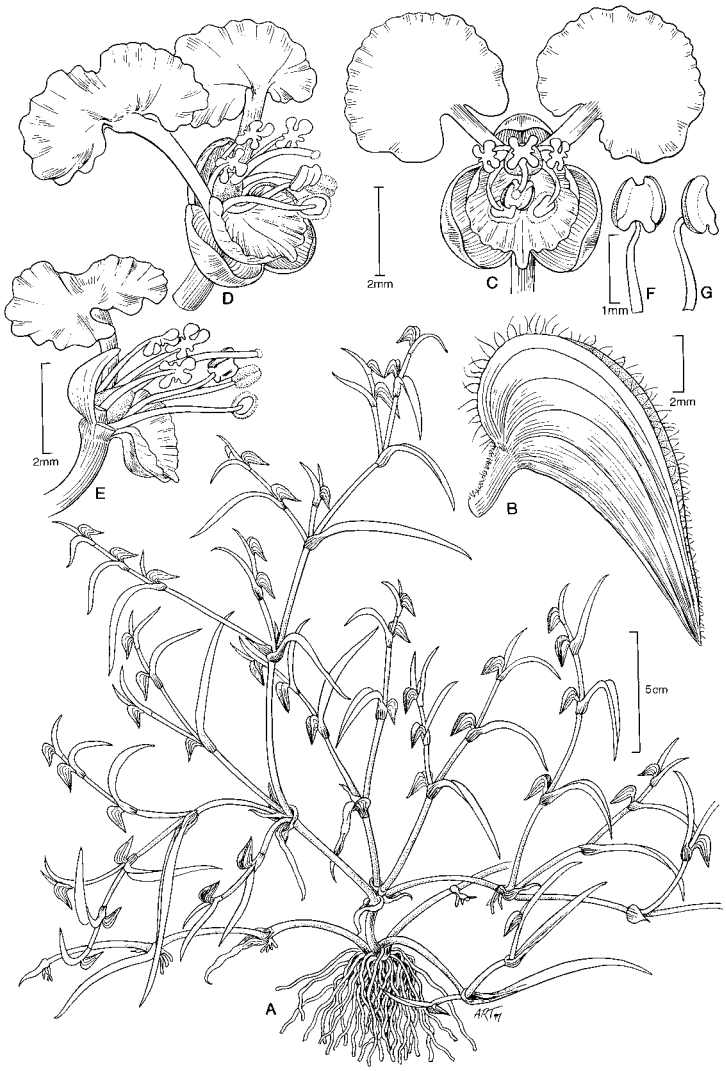
Art by Alice Tangerini

Commelina polhillii Faden & Alford

At times, the Smithsonian internship program results in a co-authored publication in a scientific journal. Robert Faden mentored Smithsonian intern Mac Alford in 1997. Their collaboration resulted in the description of a new species *Commelina polhillii* Faden & Alford (Commelinaceae) (*Novon* 11:16-21; 2001). Collections made by Faden in Tanzania in 1996 turned up a new species of *Commelina* that was very similar to *Commelina subulata*. Plants were grown for study in the Botany Department Research Greenhouse from seeds collected in the field. From these plants and herbarium collections, the characters of the two different species were investigated. The primary difference between the two species proved to be seed shape and surface pattern. Differentiation of species was also investigated by Alford using cytological and anatomical techniques. The anatomical studies of leaves revealed additional information necessary for a complete understanding of the two species.



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