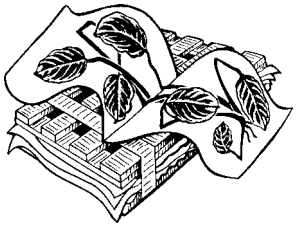
Department of Botany and the U.S. National Herbarium



The Plant Press

National Museum of Natural History
Smithsonian Institution

New Series - Vol. 2- No. 2 July - September 1999

Department Profile

Dinoflagellate Studies Confined to Cells

By Robert DeFilipps

Mangrove swamps, where the land and sea intertwine, are tropical ecosystems that still hold countless surprises for researcher Maria Faust. Mangroves are subjected to environmental disturbances; they are a nursery ground for marine fishes; and they nurture abundant populations of dinoflagellate microalgae. Yet key questions they present remain largely unanswered. Are mangrove communities as rich and productive as other tropical environments? Dinoflagellates are morphologically and ecologically diverse microscopic, unicellular organisms. Widely distributed in marine and brackish waters, and a major component of the microscopic food web, they are the least understood component of plankton. Examination of the biodiversity of dinoflagellates has revealed an astonishing number of new surprises among previously undiscovered naturally occurring events.

Spontaneous fusions of mating cells, "dancing groups" of gametes of *Prorocentrum lima* which merge through a fertilization bridge, were reported by Faust in 1993, the first time that sexuality had been observed in that species of Belizean mangrove phytoplankton. After resting, the four daughter cells arising from the zygote of *P. lima* remained sexually viable for as long as three weeks. Moreover, instead of its usual vegetative division into two cells, sometimes an alternative type of asexual reproduction can occur in *P. lima*, resulting in an agglomeration of up to 32 cells enclosed in a temporary cyst, an unusual phenomenon which was also reported as new to science by Faust in 1993.

These reports demonstrate only a few of the interesting lifestyles exhibited by the dinoflagellates, which are unicellular, cellulosic, aquatic microalgae whose walls may be either smooth, or sometimes exquisitely armor-plated (thecated) with tooled intricate surface patterns, and occasionally even prolonged into horns resembling the pointed hoods atop sanbenito garments worn by the flagellating penitentes of the Spanish Inquisition (curiously, their cells also possess flagella, two whips per cell which cause gliding and tumbling motions as they swim). In some kinds of dinoflagellate vegetative reproduction, such as known in *Prorocentrum mariae-leboriae*, each daughter cell retains one parental valve and synthesizes one new valve, as happens in the unrelated diatoms.

> *Four thousand species are known today*

Dinoflagellates have originated from the Ciliaphora, heterotrophic ciliated invertebrates that engulfed cryptophyte algae which became their symbiont as an organism. Their fossils are known from the Lower Miocene of approximately 20 million years ago, while the root word "dino" given to this ancient lineage is basically Latin for "whirling", rather than the Greek for "fearful" as in "dinosaur".

Some non-photosynthetic dinoflagellates are heterotrophic and engulf small prey such as ciliate protozoa. Others are photosynthetic and have chloroplast. Various species of photosynthetic dinoflagellate are producers of toxins, such as the *Gymnodinium catenatum* responsible for paralytic shellfish poisoning (PSP), and the *Gambierdiscus toxicus* causing dreaded ciguatera fish poisoning in humans. Such outbreaks have occurred in all the world's oceans, causing fish kills or toxic red tides, especially in coastal areas where human effluent is discharged (such as Tokyo runoff, and from Hawaiian pineapple and sugarcane fields), enriching the nutrient load available for the growth and proliferation of the organisms, but causing much fouling of the seafood which ingest quantities of the dinoflagellate cells, and consequently incurring millions of dollars of damage to industry.

The taxonomy, biodiversity, ecology, and environmental importance of dinoflagellates, at the forefront of marine biology, constitute the research focus of Faust, an investigator of these tiny algae. How tiny is "tiny" in this case? Some dinoflagellates, such as *Gambierdiscus*, are so small that they can swim freely in the interstitial spaces between sand grains. By contrast, the world's largest dinoflagellate, in the genus *Noctiluca*, is a spheroid attaining 2 mm in diameter.

Continued on page 8

New Faces

Robert Ireland has returned to the department as a collaborator. Ireland was previously assistant curator of bryology from 1958 to 1961, working with Mason Hale in the Castle. Most of his professional career was spent in Canada, where he obtained his doctoral degree at the University of British Columbia, Vancouver in 1966. He then worked for the Canadian Museum of Nature in Ottawa from 1966-1994. While there he produced a moss flora of the Maritime Provinces. He has retired to the Washington, D.C. area and will be a regular visitor to the U.S. National Herbarium to continue his study of mosses. His contact will be **Harold Robinson**.

The Plant Press

New Series - Vol. 2 - No. 2

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Web site: http://www.nmnh.si.edu/departments/botany.html.

Visitors

Sergei Vickulin, Komarov Botanical Institute, St. Petersburg, Russia; Hydrocharitaceae (March 26-May 5)

Peter Jorgensen, Missouri Botanical Garden, St. Louis; Vascular plants (March 29-April 2)

Claes Persson, New York Botanical Garden, Bronx; Polygalaceae, Rubiaceae (April 1-2)

Patrick Lewis, University of the West Indies, Kingston, Jamaica; Monocots of Puerto Rico and the Virgin Islands (April 2-June 1)

Richard Carter, Valdosta State University, Valdosta, Georgia; Cyperaceae (May 10-15)

Lucia Vasquez, Bailey Hortorium, Cornell University, Ithaca, New York; Fagaceae (May 17-21)

Lana da Silva Sylvestre, University of São Paulo, São Paulo, Brazil; Brazilian *Asplenium* (May 21-Nov 19)

Julie Barcelona, Miami University, Oxford, Ohio; Philippine ferns (May 24-28)

Tatemi Shimizu, Harvard University, Cambridge, Massachusetts; Philippine *Impatiens* (May 24)

Eric Christenson, Sarasota, Florida; Orchidaceae (May 28-30)

James Luteyn, New York Botanical Garden, Bronx; Ericaceae (June 3-4)

Paul Berry, University of Wisconsin, Madison; Venezuelan Guayanan Melastomataceae (June 14-17)

Hamilton Beltran, University of San Marcos, Lima, Peru; Plants of Camisea (June 16-30)

Jacques Florence, Museum National d'Histoire Naturelle, Paris; Flora of French Polynesia (June 16-July 15)

James Bryant, Riverside Municipal Museum, Riverside, California; Edmund Jaeger Collections (June 28-July 2)

Jose Cedeño, Jardin Botanico, University of Puerto Rico, Rio Piedras; Bromeliaceae of Puerto Rico and Virgin Islands (June 28-July 22)

Steven Wolf, California State University, Stanislaus; North American Asteraceae (June 28-29)

Collections

Selected Collections Statistics: January 1-May 31, 1999

	Transactions	Specimens
Acquisitions-(incoming)		
Open exchange	29	2,117
Gifts	74	4,397
Collected for museum	2	416
Disposals-(outgoing)		
Open exchange	84	4,823
Gifts	55	2,093
Forwarding	8	2,336
Return to Owner	9	181
Borrows-(incoming)	73	3,357
Loans-(outgoing)	126	12,030
Totals	460	31,750

[by Deborah Bell and Chris Tuccinardi]

The Spirit of Botanical Exploration

Chair With A View — W. John Kress

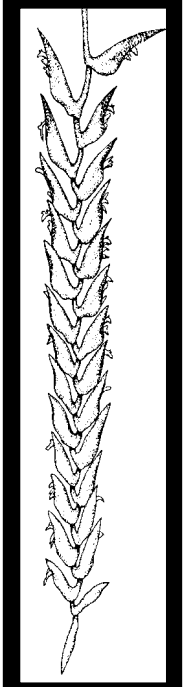
We all look back in envy and excitement at our predecessors of the 18th and 19th centuries who set out for unknown lands in search of new plants and animals. These botanical and zoological explorers included the likes of Darwin, Spruce, Wallace, Bates and von Humboldt. Their biological explorations of the newly discovered areas of the globe, particularly in South America and Asia, lasted for years and the travel was neither fast nor easy and usually by boat. These adventurers were driven primarily by their curiosity of the natural world, although the discovery of new spices, medicinals and food plants was often the prime motivation of their sponsors and benefactors. The discovery of new species was a daily task even if many of these taxa were not described for decades. The unexplored habitats seemed endless and unbounded.

At the end of the 20th Century we, as plant taxonomists, continue these voyages of exploration. But how different they are. Rather than taking years to complete, our collecting efforts more often than not occupy only a few months or even weeks to complete. We are more like botanical "swat teams" descending on the few remaining pristine habitats at the end of the logging roads or Amazonian tributaries for just a short time in a race to beat the multinational timber concerns and expanding local populations. We can now jet half-way around the planet with unbelievable speed to spend a few days in a forest where our efforts too often may simply document the demise of a species. Like our predecessors, our motivation is also curiosity-based, but unlike them we are driven by the realization that our time to discover is finite. What would Wallace or Darwin think?

Margaret Mee, one of the great botanical artists of the century, who is being honored by the exhibit "Margaret Mee - Return to the Amazon" currently ending its travels with a final show at the Smithsonian, was certainly a botanical explorer of the early tradition. Her life exemplifies the spirit of natural history exploration, yet her 35 years of travel in the Amazon clearly illustrate the transition from curiosity-driven to mission-driven discovery. Following in the steps of Spruce, she traveled up the various tributaries of the Amazon and the Rio Negro in search of new plants to document in her paintings and collections. But it is clear that during the decades of travel in the basin, the changes brought on by the settlement of the region caused her great distress. Her final years were occupied with taking the message of habitat conservation wherever it might be heard.

Margaret Mee was not a professional botanist, but it was clear that she knew much about plants. Margaret Mee was not a professional explorer, but she went many places few Europeans or North Americans had ever visited. Margaret Mee was a painter and artist who combined artistic expression with nature, science, and in her later years, conservation. Her early glorious paintings of bromeliads, orchids, clusias, and heliconias are striking in their color and form as well as scientific accuracy. She painted bold flowers on white backgrounds so the plants' individual characteristics would stand out. However, in her later works the focal plant species of each painting became an icon of nature and naturalness, set in a canvas that was filled with other plants and animals that composed the habitat in which it was found. In the works in which she portrays nature as a whole and not as individual species, we feel her passionate response to the Amazon and her concern for its future.

I named a plant after Margaret Mee (see "Art by Alice Tangerini" in this issue) because she was the first one to bring this new taxon to my attention in one of her paintings. From her accurate observations of this species on the Rio Vaupés, I was able to identify a handful of herbarium specimens that others had collected in that region and I eventually tracked down a wild population on the banks of the Rio Orinoco in Venezuela. However, in retrospect it is clear to me that I really named this plant after the spirit of Margaret Mee. She explored the world of plants through her artistic passion and showed us her vision and discoveries of the Amazon in her paintings. In that spirit we must all continue our own explorations of the world to be able to share our own visions of this ever shrinking planet.



Staff Research

Gery Allan was recently awarded a Smithsonian Postdoctoral Fellowship for a project on "Biogeographic Relationships Between Western North American and Mediterranean Floras: Insights from Molecular and Morphological Phylogenetic Studies of *Lotus* L. (Faboideae: Fabaceae)." Mediterranean regions include the Cape region of South Africa, central Chile, southwest and southern Australia, California, and the borders of the Mediterranean Sea. They are remarkably similar in climate, topography, flora and fauna, and Allan's morphological and molecular research on the underlying phylogenetic relationships of disjunctions in their component organisms, such as *Lotus*, will add to the understanding of how these floras and faunas developed.

Allan conducted field work in April on *Pittosporum* of Kauai, Oahu and the Big Island of Hawaii. Research on hybridization will lead to an understanding of the evolution and phylogeny of morphotypes in their complex breeding systems, in which species are either unisexual, bisexual, or polygamous.

Molly Nepokroeff received a XVI International Botanical Congress Fellowship to deliver a paper on "Breeding System Evolution in Hawaiian and Pacific *Psychotria* (Rubiaceae)" at a symposium on "Adaptive Aspects of Plant Evolution on Islands" which was held in St. Louis, Missouri.

Dan Nicolson led two excursions for the Botanical Society of Washington in April to Bear Island, Maryland, where native cactus (*Opuntia humifusa*) and moss pink (*Phlox subulata*) occur on the rocks overlooking the Potomac River. Thirty-three and 50 species, respectively, were noted in flower on the trips, including twinleaf (*Jeffersonia diphylla*), rumored to be increasingly rare.

Alice Tangerini received a shipment of 266 botanical illustrations from Robert Jack Downs of the University of North Carolina, after she requested the remainder of the plates from Lyman Smith's Monograph of the Bromeliaceae in *Flora Neotropica*. Of the total, 234 were illustrations of Bromeliaceae and an additional 32 had appeared in Smith's publications in the *Flora of Santa Catarina* (Brazil). A second shipment, comprising photographs and negatives of the plates, included identifications of some of the artists by Downs. One of the artists, "HD" or "DH", was confirmed after consulting with **Steve Smith** to be Donald Dixon Hall, one of the "Kensington Kids" whom Dr. Smith hired as summertime illustrators. However, some of the artists are still known only by their initials on the drawings, so the mystery continues. Volunteer Maxine Schein continues to work on mounting and labeling the drawings.

Atherton Seidell Grant Awarded for Checklist of Myanmar Plants

The **Plants of Myanmar Project** has been awarded $20,000 from the Atherton Seidell Award Program of the Smithsonian Institution, for publication costs of the 5th Edition of the "List of Trees, Shrubs, Herbs and Principal Climbers, etc. Recorded from Burma" now in preparation by members of the department and colleagues in Myanmar. The first attempt at a comprehensive list of the seed plants of Burma was compiled in 1912 by J.H. Lace and published as the First Edition of the "List…", which included 2,483 species. A Second Edition listing 2,927 species was updated by A. Rodger in 1922. In 1961 H.G. Hundley and U Chit Ko Ko updated the earlier work with a more complete treatment of the grasses, orchids and herbs. About 7,000 species are included in the Third Edition and the more recent Fourth edition published in 1987.

The core of the now out-of-print Fourth Edition is a list of the species then known in Burma arranged taxonomically according to the 1862-1883 system of Bentham and Hooker. Notes on plant habit, common English and Burmese names, taxonomic synonymy, and geographic distribution are given for each species and a glossary, list of abbreviations, and indices to Burmese, English, and Latin names are also provided. The entire work of 580 pages was published by the Forest Department in Rangoon. **John Kress** purchased the last copy in a secondhand book store in Yangon in July of 1998.

The new Fifth Edition will include an updated list, reformatted from the original Bentham and Hooker order to the classification provided by R.K. Brummitt (*Vascular Plant Families and Genera*, 1992), which has become the standard for such works. The entry for each species will include the Latin binomial, author, plant habit, habitat, distribution by State/Province, and common Burmese and English names where available. These revisions will provide a modern usable checklist of the seed plants of Myanmar for use by taxonomists, foresters, conservationists, and students in Myanmar as well as the rest of the world.

The Fifth Edition will be published jointly by the Forest Department of Myanmar and the Department of Botany at NMNH. We have received an initial offer to produce the volume through The New York Botanical Garden Press, which has published similar works in the past. A companion Web version of the checklist is also being developed, which will offer an opportunity to reach a more diverse audience worldwide, and provide an interactive user interface that can be tailored to the requirements of specific groups of users. It will be enhanced with maps and images, and will allow updating of the data as new information becomes available. It is hoped that both versions will be available by mid-2001.

[*by John Kress*]

Margaret Mee: Return to the Amazon Exhibition

The traveling exhibition, Margaret Mee: Return to the Amazon, documents the life and work of Margaret Mee (1909-1988), and bridges the worlds of art and natural science while confronting the global issues of rainforest destruction and preservation. Appearing at the National Museum of Natural History from May 28-August 20, the exhibit was co-organized by the Royal Botanic Gardens, Kew and the Houston Museum of Natural Science. Washington, D.C. is the seventh and last stop for the show which has previously attracted audiences in Texas, California, Tennessee, Minnesota and Illinois. The exhibit is curated by Ruth L.A. Stiff, the curator of North American exhibitions at Kew, and author of the illustrated book, *Margaret Mee: Return to the Amazon* (RBG Kew, 1996, 201 pp.). The exhibition features Mee's artistically striking and botanically accurate watercolors. It also includes examples of her field sketches, diaries, a portion of a video interview, and a large model of a bromeliad with many of the organisms dependent on it for their existence.

Photo courtesy of None Such Expeditions

Mee trained as a painter at Camberwell School of Art in London and originally became an art teacher. While in her 40's, in 1952, she moved from England to Brazil with her husband Greville, and became interested in painting the plants of the Amazon, especially orchids, bromeliads and other species with exotic flowers. It was then that she became enraptured with the rainforest, inspired directly by the experiences of an earlier traveler, the famed Richard Spruce, who had sent specimens to William Hooker at Kew. Subsequently she made fifteen journeys in Brazil, paralleling in general the journeys of Spruce, to sketch and paint the plants as they grew in their natural habitats. She also brought back living specimens.

As her concern for the conservation of the Amazon grew, she increasingly began to place her floral subjects in a forested background instead of against a plain white background as she had originally done. Some of these later paintings are also on display. The exhibit seeks not only to present to the visitor the beauty and scientific accuracy of her art, but also to educate the public about the conservation of irreplaceable ecosystems, and the biodiversity, pollination mechanisms, botanical research and other current scientific efforts in the Amazon.

During her journeys in Brazil, Mee discovered several new plant species, some of which were later named in her honor, and she rediscovered others that had not been seen by scientists for decades; in her paintings and diaries are documented some species now thought to be extinct. As the years passed, she observed the increasing encroachment of human activities which caused alteration of Amazonian habitats at an alarming rate. Margaret Mee was one of the first to speak out for, and act on behalf of, conservation of the rainforest and its inhabitants.

On her fifteenth and final venture into the Amazon, Mee finally realized her dream of capturing on paper an event few people have seen: the anthesis of the moonflower, *Selenicereus wittii* (Cactaceae), whose white flowers open for only one night of the year, and only by moonlight under the right conditions. In 1988 this exceptional explorer, botanical painter and conservationist who had survived years of hazardous journeys in the Amazon, who had influenced, inspired and contributed to science, art and conservation, was fatally injured in an automobile accident in England. Her legacy lives on in her accomplishments.

In addition to the National Museum of Natural History, lenders of material for this exhibition include the Royal Botanic Gardens, Kew; the Margaret Mee Amazon Trust; Fundacão Botanica de São Paulo; and private collections.

[*by Shirley L. Maina*]

New Features on the Department of Botany Web Site

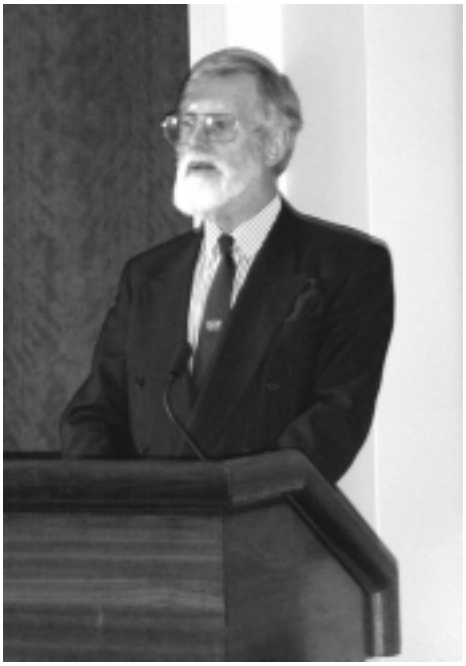
The Department of Botany Web site introduces two new items, a site index [http://www.nmnh.si.edu/botany/siteindex.htm] and site query page [http://persoon.si.edu/botany/sitesearch/search.cfm]. These features will make it easier for the browser to find the desired topic by either clicking on an item in the index or entering a keyword in the query page. In addition, it now features the latest issue of *The Plant Press* as well as all previous issues through 1998, which are linked under the "Publications" page and may be visited at: http://www.nmnh.si.edu/botany/plantpress/plantpress.html. The Botany Web site address is: http://www.nmnh.si.edu/departments/botany.html.

[*by Sylvia Stone-Orli*]

Director of Royal Botanic Gardens, Kew Visits Department

Prof. Sir Ghillean T. Prance (b. 1937, Brandeston, Suffolk), for eleven years director of the Royal Botanic Gardens, Kew and currently the president-elect of the International Association for Plant Taxonomy, visited the department in May while in Washington, D.C. to present lectures in conjunction with the Margaret Mee exhibition (see related article in this issue). Iain (short for Ghillean) became acquainted with the department in 1964. During a brief interview wedged into his visitation schedule, he observed that the Smithsonian has a very important position in world plant systematics, and that as one of the major botany departments, it is crucial that the momentum of development of its research, staffing, and collections be maintained with supportive funding.

In August 1999, Sir Iain (who was knighted by Queen Elizabeth in 1995), will vacate his position as the Kew Director to Prof. Peter Crane. Under Prance's tenure there was an impressive facilities construction program at Kew, resulting in the Sir Joseph Banks building (1990), restoration of the Palm House (1990), and extensions to the Jodrell Laboratory (1994), as well as laying of the foundations of the Millennium Seed Bank (1998) and the Centre for Economic Botany (CEB) with its "Local Plants for Local People" program in northeastern Brazil. Completion of the *Flora of Tropical East Africa* is now an important Kew corporate goal for the year



2005, with *Flora Zambesiaca* to be finished shortly thereafter.

Few botanists and conservationists are the subject of a book-scale biography like the one on Prance by Clive Langmead, entitled *A Passion for Plants: From the Rainforests of Brazil to Kew Gardens* (1995). In it Sir Iain's fervor for plants and his ideologies are given broad coverage. The book will soon be reissued with the addition of information on "The Kew Years" and color photos. In addition to numerous articles on conservation of the Brazilian forests and detection of areas of endemism in the country, he has made extensive observations and published on the Chrysobalanaceae and Lecythidaceae; the giant *Victoria amazonica* water lily; and his newly described family Rhabdodendraceae. In the field of ethnobotany, Prance has studied the hallucinogens and other plants utilized by at least six Brazilian Amerindian tribes: Mayongong, Paumari, Yanomami, Jagua, Maku and Deni.

In retirement, Prance will be working out of the Plant Sciences Department, University of Reading, Whiteknights, Reading, Berks. RG6 2AS, England (to which specimens may be sent for identification). Initially his large-scale projects will be to finish Proteaceae for *Flora Neotropica*, and prepare a treatment of the c.540 species of Chrysobalanaceae for *Species Plantarum*, a modern flora of the vascular plants of the world. The field guide to 2,000 plant species occurring in a forest reserve near Manaus, Brazil, referred to in his visionary article "Beyond the Floras" (*Australian Systematic Botany* 11: 153-159. 1998), is now in press for 1999, to be published first in Portuguese, later in English.

Sir Iain and Lady Prance reside at The Old Vicarage, Silver Street, Lyme Regis, Dorset DT7 3HS, England; telephone 01297 44491; e-mail: gtolmiep@aol.com.

[by Robert DeFilipps]

Egbert H. Walker Okinawa Exhibit

Dr. Egbert H. Walker, a Department of Botany staff member for 30 years beginning in 1928, will be honored in an exhibit planned for spring 2000 in Okinawa, sponsored by the "A Retrospect of Okinawan Scenes" steering committee of the Okinawa Prefectural Government and Ryukyu Shimpo Newspaper Co., Ltd. Dr. Tetsuo Koyama, Director of the Museum of Bioresource Sciences, Nihon University, Kanagawa Prefecture, Japan is the researcher.

Filming in conjunction with the project took place in the department, NMNH and SI Archives in May 1999. A small reception was held in the Castle, where the former Governor of Okinawa, Dr. Hiroko Sho, presented a letter to Secretary Heyman thanking him for the Smithsonian's assistance in making Dr. Walker's slides and archives available. Also in attendance were the initiator of the project, Mr. Katsuo Nakamoto, president of Nakazen Herbal Medicine Co.; Mr. Tomohiko Tamaki, director of Okinawa Cable Network TV; Mrs. Jeanne Houghton, Dr. Walker's daughter; and **Dan Nicolson** and **Deborah Bell** representing the Department of Botany.

During World War II, Dr. Walker was in charge of the Serviceman's Collecting Program, and collected over 7,000 plants in the Okinawa area himself. Responses from personnel in the services came from various areas, but in particular from botanists in the army of occupation in Okinawa. This led to Walker's publications on *Important Trees of the Ryukyu Islands* (1954) and the *Flora of Okinawa and the Southern Ryukyu Islands (*1976). His 300+ kodachrome slides have retained good color quality, and are of particular interest to the exhibit committee as they represent perhaps the only color slides of Okinawa taken in 1951.

Several years ago a former serviceman called from the visitor's desk in NMNH inquiring about specimens he had collected in Okinawa. We found the accession documentation through the Donor File in

Continued on page 7

Travel

Vicki Funk (4/12-4/23) traveled to Raleigh, North Carolina to teach a two week course on Asteraceae at Duke University; (6/20-6/26) to Madison, Wisconsin to attend the evolution meetings; and (7/25-8/6) to St. Louis, Missouri to attend the Nomenclature Section and International Botanical Congress.

John Kress (4/12-4/27) traveled to Bangkok and Chiang Mai, Thailand to conduct research on Zingiberaceae; (6/14-7/6) to Hilo and Honolulu, Hawaii, Bangkok, Thailand and Yangon, Myanmar to conduct research, and collaborate with Burmese botanists on the Revised Checklist of the Plants of Burma project; and (8/1-8/7) to St. Louis, Missouri to attend the International Botanical Congress.

Liz Zimmer (5/1-5/4) traveled to Pullman, Washington to attend a workshop on "Phylogeny of the Major Clades of Angiosperms" sponsored by the Green Plant Phylogeny Research Coordination Group. She gave talks related to three 1999 International Botanical Congress symposia, and planned the production of a special issue of the International Journal of Plant Sciences documenting these presentations; (5/29-6/13) to Cali, Colombia to co-host and participate in the third annual "Curso Intensivo de Molecular Genetica y Biodiversidad", sponsored by CIAT and the Instituto Humboldt; and (6/22-6/27) to Madison, Wisconsin to attend annual evolution meetings and give a poster presentation on "Molecular Evidence for the Placement of *Takhtajania* in the Winteraceae". She also attended the Society of Systematic Biologists council meeting, and as chair of the Student Awards Committee, coordinated the judging for the Ernst Mayr Award.

Warren Wagner (5/14-5/16) traveled to New York City to attend a workshop on extinction criteria at the American Museum of Natural History; and (8/1-8/8) to St. Louis, Missouri to attend the International Botanical Congress.

Paul DePriest (5/19-5/27) traveled to Stockholm and Uppsala, Sweden to participate in a Ph.D. dissertation defense for Leena Myllys of the University of Stockholm; (7/5-7/18) to Durham, North Carolina, and Tallahassee and Orlando, Florida to conduct field research and collect lichens; and (7/26-8/7) to St. Louis, Missouri to attend the International Botanical Congress.

Liz Zimmer and **Gery Allan** (5/20-5/22) traveled to Philadelphia, Pennsylvania to attend a symposium on the life and activities of John and William Bartram at the Academy of Natural Sciences.

Ida Lopez (5/25) traveled to Miami, Florida to collect frozen Zingiberaceae tissue.

Mark and **Diane Littler** (6/5-6/21) traveled to Guam to teach at the University of Guam and conduct research; and (7/7-7/30) to Ft. Pierce and Big Pine Key, Florida to continue ongoing research at the Smithsonian Marine Station.

John Boggan (6/18-6/21) traveled to Morris, New Jersey and New York City to lecture on the genus *Chirita* to two chapters of the American Gloxinia and Gesneriad Society, and (6/29-7/5) attended the national convention of the American Gloxinia and Gesneriad Society to present a report as Botanical Review Chair and supervise classification of a flower show.

Joan Nowicke, **Stanwyn Shetler**, and **Sylvia Stone-Orli** (6/20-6/25) traveled to North Manchester, Indiana to attend the Annual Field Meeting of the NE Section of the Botanical Society of America, Philadelphia Botanical Club and Torrey Botanical Club; Nowicke (8/1-8/14) traveled to St. Louis, Missouri to attend and present a paper at the International Botanical Congress, and participate in the IBC official field trip to the Edwards Plateau, Texas.

Leslie Brothers (6/29-7/4) traveled to Nashville, Tennessee to present a talk, gather information and discuss growing techniques at the 43rd annual meeting of the American Gloxinia and Gesneriad Society.

Laurence Dorr (6/29-7/10) traveled to Caracas and Guanare, Venezuela to collect and study plants for Flora of Guaramacal, and (7/26-8/7) to St. Louis, Missouri to attend the International Botanical Congress.

Robert Faden (7/1) traveled to Boston, Massachusetts to examine research specimens with an environmental scanning electron microscope.

Barrett Brooks (7/14-7/23) traveled to Ft. Pierce and Big Pine Key, Florida to continue research at the Smithsonian Marine Station.

Dan Nicolson (7/25-8/12) traveled to St. Louis, Missouri to attend the Nomenclature Section, the International Botanical Congress, and 8th International Aroid Congress.

Pedro Acevedo, Ellen Farr, Maria Faust, **Paul Peterson**, **Linda Prince**, **Laurence Skog**, **Mark Strong**, and **Dieter Wasshausen**, (7/26-8/7) traveled to St. Louis, Missouri to attend the International Botanical Congress.

Michael Bordelon (7/28-8/1) traveled to Boulder, Colorado to attend a conference of the Association of Education and Research Greenhouse Curators.

Robert DeFilipps (8/1-8/8) traveled to St. Louis, Missouri to attend the International Botanical Congress and a meeting of the Flora of China project.

Alice Tangerini (8/7-8/13) traveled to Pasco and Richland, Washington to attend the annual meeting of the Guild of Natural Science Illustrators and present a workshop on botanical illustration.

Okinawa Exhibit

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the Office of the Registrar, and to my delight, it contained a list of determinations by Egbert Walker. I don't know who was happier about finding the collections mounted and filed in the herbarium, the donor or me! There is an appropriate quote by Dr. F. Ray Fosberg in an obituary of Dr. Walker (*Taxon* 41: 618-620. 1992): "Any perceptive botanist who works extensively in the general Old World collections in the U.S. National Herbarium can scarcely fail to appreciate the prevailing good order and evidence of care he finds there, largely the work of Egbert Walker over many years."

[by Deborah Bell]

Dinoflagellates

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Altogether, the tally of dinoflagellates is around 4,000 known species, but it has been estimated that the number awaiting discovery may eventually double the total to 8,000 different kinds.

Faust's field collecting has taken her to places as widely separated as the Oshigaki and Iriomote Islands of Japan, and mangrove habitats on Carrie Bow, South Water, Twin, and Pelican Cays, Belize. Her laboratory environment is situated in the countryside of Suitland, Maryland at the Museum Support Center, a large 4.5 acre industrial type building. Despite the austerity, these surroundings are eminently conducive to the long periods of uninterrupted work to which Faust is accustomed.

The only member of the Department of Botany who routinely conducts research on microscopic organisms (usually less than 100 microns in size), she must approach the dinoflagellates by means of modern specialized optical and biochemical technology, including scanning electron microscopy, differential interference contrast and epifluorescence light microscopy, to discover life cycle events. Computerized applications, assisted by museum specialist Rose A. Gulledge, are also in the forefront, since Faust has initiated a multimedia database for type specimens in the National Dinoflagellate Collection, and methods for identification of harmful tropical dinoflagellates using LINNAEUS II software developed by the Expert Center for Taxonomic Identification.

In addition to the perspective on the manifold roles of dinoflagellates in estuarine and marine ecosystems, Faust has described two new genera and 25 new species, mostly in the *Journal of Phycology* and *Phycologia*. She wears the laurels of her achievements lightly, but her pioneering research has made her the first person to illustrate the linkage between phytoplankton primary production and the utilization of extracellular photosynthetic organic carbon by bacterioplankton in an estuarine ecosystem. She also first demonstrated that recreational marine traffic contributes significantly to fecal pollution of estuaries. On the heels of her earlier studies on the ecology of the Chesapeake Bay, an environmental law was passed that prohibits the dumping of human waste from boats into estuarine waters.

Moreover, she was instrumental in reporting the effects of spectral light quality on the productivity of dinoflagellates grown in blue, green and orange wavelengths of marine spectral quality, leading to a better understanding of the role of environmental control of photosynthetic processes. That role is paramount for understanding aquatic primary production in the marine food web, and the development of red tides. Speaking of marine food, Faust was also the first to observe an expanding feeding canal, an orifice located in the girdle (cingulum) of the cell of photosynthetic *Ostreopsis* species, which constitutes the fourth known type of food entry mechanism for the purpose of engulfing prey such as ciliates.

With all this research underway, there are still subtle unresolved mysteries of dinoflagellate biology to be solved. For example: What triggers sexual reproduction of dinoflagellates? What is the origin and underlying phylogenetic relationships of the condensed dinoflagellate chromosomes? What is the reason for the intricate horned ornamentation - to make cells hydrodynamically more efficient swimmers? However, the most important question today is, what are the triggering cellular mechanisms of the neurotoxic events in dinoflagellates?

Although Faust's studies have made significant discoveries on the biology of dinoflagellates, a huge gap still exists in our understanding of how the different components of intricate interactions work together in the microscopic marine food web, the new frontier in marine sciences. Studies can lead to an understanding of the impact of dinoflagellates on environmental quality in the biologically most fascinating areas on earth, the coastal mangroves.

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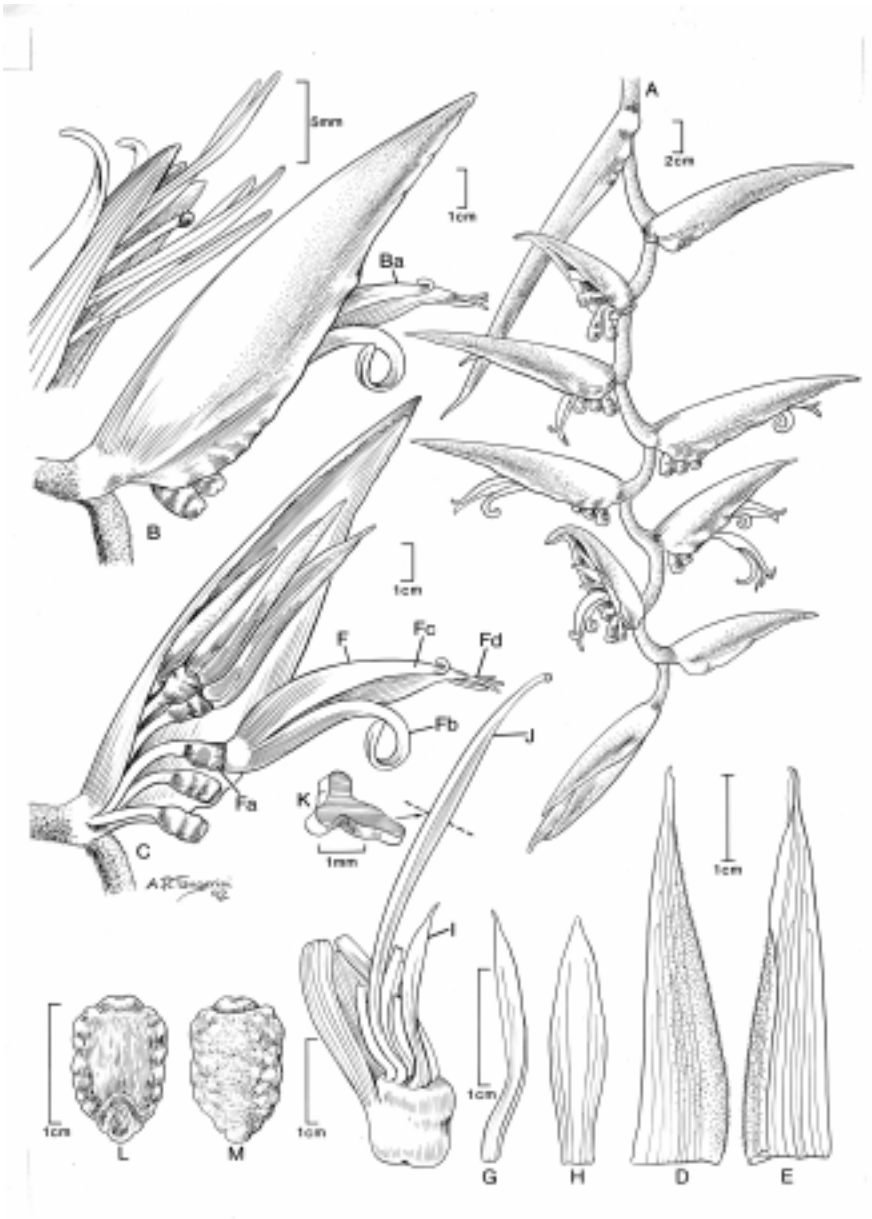
Art by Alice Tangerini



Heliconia chartacea var. *meeana* W.J. Kress

Heliconia chartacea var. *meeana* W.J. Kress (Heliconiaceae) was described in *Biollania Edicion* No. 6 (1997), a festschrift in honor of Dr. John J. Wurdack. The cincinnal bract and rachis of the plant is yellow, in contrast to the deep red and pink of the typical variety. It is named after Margaret Mee, who painted the new variety as observed along the Vaupés River, Brazil in 1985. Her painting is displayed in the Mee exhibit (see related article this issue). In 1991 the new variety was sought and collected by John Kress in Venezuelan Amazonia, after receiving a specimen previously collected by Dr. Paul Berry.