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History of Mycological Illustration Exhibit

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It is difficult here in the 21st century to imagine what it was like for early mycologists attempting to identify their collected specimens. They did not have the technology, tools, and sheer number of printed works that most of us are surrounded by today. There were no microscopic views, no color photographs, and for many, no illustrations to compare with their specimens. Often the specimens they had were not even fresh. Detailed and accurate illustrations were crucial for correct identifications. In a paper read before the Botanical Society of Washington, D.C. in December 1921, mycologist L. C. C. Krieger pointed out the importance of a good illustration, stating "Every taxonomist will admit that illustrations are essential for the identification of many plants, especially in the case of the fleshy, perishable fungi." Krieger noted that the best illustrations accurately portray the organism's size, shape, color, and other physical characteristics.

The Farlow Library is currently showcasing an exhibit that highlights important points in the development of mycological illustration. It is titled The History of Mycological Illustration, and will be on display through December 2004. This exhibit will also be available on-line at the Botany Libraries website. Click on <http://www.huh.harvard.edu/libraries/Exhibits.html> to view the full chronology and selection of plates.



Figure 1

The earliest example of a printed fungus appears in the work Ortus Sanitatis (1491), and is an example of the technique of wood block printing (**Figure 1.**)

This process begins by drawing or tracing the subject onto the surface of a block of wood, and then the

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lines or areas that are to be left white or unprinted are cut away with a knife or gouge. Ink is rolled over the wood block design and the block is pressed onto the paper to complete the printing process. The resulting black and white image is often quite striking, but lacks the detail essential in species identification. Nevertheless, the process was in general use throughout the 15th and 16th centuries and found in works by such important mycologists as Pietro Andrea Mattioli (1500-1577), Carolinus Clusius (1526-1609), and Robert Hooke (1635-1703).

The work of illustrators was greatly enhanced by the introduction of steel and copperplate engraving in the 17th century. This method involves cutting lines into the copper to create what is known as a burr. The carved lines hold the ink, rather than the raised surfaces in wood block printing, to create a more refined image. Shading is added by crosshatching the metal to achieve a greater sense of form and depth. The finished plate is inked and pressed against the paper, and then run through two rollers to produce a clean, sharp image.

The first copperplate engraving of a fungus was published in 1675 in Franciscus van Sterbeeck's (1631-1693) Theatrum Fungorum Oft Het Tooneel der Campernoelien (**Figure 2**). Sterbeeck, a

Flemish priest of noble extraction, suffered a chronic illness and turned his attention to botany. Of the 135 illustrations of hymenomycetes included in Theatrum Fungorum, it is estimated that 77 were taken from Clusius and another 14 from other contemporary botanists. While the plates



Figure 2

While the plates

may be in a large part copies of others' work, much of the text includes new information. These images were an improvement over wood cut images, but still of limited use unless colored by hand.

By the mid-18th century a method was devised to add color to the engraved plate. Johann Wilhelm Weinmann (1683-1741) was the first mycologist to use this method in his Phytanthoza Iconographia (1737-1745). Unfortunately, his illustrations lacked both accuracy and clarity, and proved that another method for color printing was needed.

Even though the technology of printing did not improve in the late 1700s, the quality of mycological illustration did improve because naturalists employed artists to hand color their plates. These illustrations were generally more accurate and identifiable, but the practice was costly, time consuming, and often lacked consistency. In some cases the differences were subtle, but there were many examples of the same mushroom portrayed in totally different colors. Jacob Christian Schaeffer (1752-1826) was one of the earliest mycologists to use this technique in his work Fungorum Qui in Bavaria et Palatinatu Circa Ratisbonam Nascuntur Icones. When comparing the same plate from two separate copies of his work, however, it is easy to see that there are slight differences in coloration.

Printing was revolutionized in the 1800s with the emergence of lithographic printing. The process of lithography was actually invented in 1798 by Bavarian actor Alois Senfelder, but he kept it a secret until about 1818. However, Senfelder's use of his invention was so poor that lithography did not catch on until the mid-1800s.

The lithographic process is much different from the earlier methods of printing. Colored

inks are applied to a grease-treated image on a flat printing surface. Blank areas that hold moisture repel the lithographic ink. The inked surface is then printed directly onto paper. Finally, mycologists had a technique that gave them necessary detail and consistent application of color. Sarah Price's Illustrations of the Fungi of our Fields and Woods, published 1860, provides one of the earliest examples of mycological lithographs. One of the finest examples of color lithography was published in the early 1900s. It is Emile Boudier's (1828-1920) Icones



Mycologica, ou Iconographie des Champignons de France Principalement Discomycetes (Figure 3 example). When this work was published in 1905 it was proclaimed as the "acme of excellence."

Figure 3

The dawn of the 20th century brought a host of new printing processes. Heliotype as used in W.G. Farlow's Icones Farlowianae (1929), collotype as used by Jakob Lange in Flora Agarica Danica in 1935-1940, and half-tone were just a few, but none had the impact on the nature of scientific illustration that lithography had - until the introduction of photography. One of the earliest mycological works to use photography was published in 1905. It was The Mushroom Book. A Popular Guide to the Identification and Study of our Commoner Fungi... by Nina Lovering Marshall. The quality of the photographs, however, are poor. The images were later colored by hand so they did not provide a reliably accurate representation of the fungi. Even as late as 1915 color photography was not being used in mycological works. In the Presidential

Address to the British Mycological Society in 1915, Emma Amy Rea delivered a lecture on the history mycological illustration. Mrs. Rae stated that "Up to the present I am not acquainted with any colour photographic reproductions taken from the living fungi themselves...."

There were advances in color photography during the late 1920s and early 1930s, most importantly, the invention of three emulsion color film, or Kodachrome, in 1935. It was still an expensive process and the dyes have proved unstable. It wasn't until the mid twentieth century that color photography became a reliable and viable option. Colored photographs provided scientists with a true and accurate view of their specimens. Today scientists are able to combine color photographs with microscopic images and illustrations to provide the most accurate and detailed view of a specimen possible.

The works listed above as well as others are featured in the Farlow Library exhibit The History of Mycological Illustration, which will be on display through December 2004. This exhibit will also be available on-line. Click on <http://www.huh.harvard.edu/libraries/Exhibits.htm> to view the full chronology and selection of plates.



from Seger's Fungus Anthropomorphus, 1671

News of the Farlow

These days the Farlow is nearly surrounded by construction related to the Biological Research Facility being constructed in the Biological Laboratories. Access has further been limited by work on Divinity Avenue related to relocation of utilities. Getting here can be a challenge, but signs have been placed to help direct you. Despite the obstacles we have had several visitors. **Curtis Hansen**, Curator at the herbarium at Auburn University came to the Farlow in June to look for lichens from Alabama. He is beginning a checklist and was using the Farlow collections to add historical records to the list. Also in June **Tobias Frøslev**, graduate student at the University of Copenhagen, visited the Farlow and gave a seminar on his studies of some species of the genus *Cortinarius*. Among our regular visitors and users are our own **Sam Hammer** and **Doug Greene**. **Scott LaGreca** (now at the British Museum of Natural History), hardly a stranger but now in the visitor category, was here using collections in early September.

Our curatorial staff is now enhanced once again by **Eileen Wozek**, who has returned part-time from maternity leave. **Genevieve Lewis-Gentry** has been working in the Farlow two days a week for some time.

We are pleased to announce that our mycological ranks will be increased on the Harvard faculty with the addition of **Dr. Anne Pringle** who will arrive in the fall of 2005 as an Assistant Professor in the Department of Organismic and Evolutionary Biology. Dr. Pringle, who is currently a post-doctoral fellow at the University of California, Berkeley with John Taylor, has done work on the ecology of mycorrhizal fungi and is interested in questions of ways

in which fungi compete, survive and diversify.

Farlow staff and students have been on the road in the last months. **Don Pfister** visited **Jean Ristaino** at North Carolina State University in April and he participated in a meeting on the International Plant Name Index at Kew Gardens in May. In July he was in Iceland collecting and studying fungi with collaborator Guðrídur Gyða Eyjólfsdóttir in the city of Akureyri in northern Iceland. At the end of July he taught a weeklong seminar on fungal biology at the Humboldt Field Research Institute and Eagle Hill Foundation in Steuben, Maine.

Post-Doctoral Fellow **Karen Hansen** spent time collecting in Ecuador and Colorado. She and graduate student **Brian Perry** also traveled to New Mexico where they collected, with Dr. Nancy Weber and others, with the New Mexico Mycological Society. Graduate student **H. H. "David" Chou** spent the summer at the University of Florida Gainesville in the Plant Pathology Department where he was working on developing techniques related to his study of development of sclerotia and apothecia of *Sclerotinia sclerotiorum*. He was in the laboratory of Dr. Jeffery Rollins. **David Hewitt**, graduate student, attended the Gordon Conference on Cellular and Molecular Biology of Fungi where he presented a poster. **Kris Peterson**, traveling graduate student, returned to Cambridge in September to work on her *Cyttaria* study.



Judith Warnement at 15 years



On September 9th, the Botany Libraries celebrated in grand style the 15 years of service our librarian, Judith Warnement, has given to the Libraries. Judy came to us 15 years ago with experience in medical

libraries but she soon took to the botanical subject area that is represented in our collections. She has overseen many projects including the conversion of the card catalogue to machine-readable form. Under her direction, archives activities have expanded, cataloging has been clarified and the collections have continued to grow in an organized and logical way. In the course of her 15 years here she has probably personally moved every book in the stacks. This is no small task when one realizes that there are 285,000 items in the entire collection (about 60,000 in the Farlow). Judy has been the ultimate Friend of the Farlow in every year preparing book lists and pricing for the annual book sale and in assisting Friends in their library searches. She is always at the Annual meeting. Judy's energy, enthusiasm, and commitment to the collections has brightened, enlightened and sustained our libraries. We look forward to her presence here for many years to come.

Library Hours

Members are welcome to use the Farlow Library Reading Room for their research and enjoyment. The room is open Monday through Friday from 9:30 a.m. to 12:00 p.m., except for university holidays. Material may be retrieved and used in the upstairs Reading Room from 12:30 p.m. through 4:30 p.m.

FOF Annual Meeting

The Annual Meeting will be held on **Saturday, November 6 at 3:30 PM** in the seminar room of the herbaria. A short business meeting will precede the program.

Dr. Amy Rossman, Research Leader in Systematic Botany & Mycology Laboratory at Beltsville, Maryland will speak on "Systematics of Invasive Fungi and the U.S. National Fungus Collections (BPI)." Her talk will include a discussion of Karnal Bunt, Daylily Rust, Dogwood Anthracnose, Soybean Rust, SOD, *Fusicoccum* on madrone, as well as the work of Dr. Rossman's predecessors at the Beltsville laboratory. She will also go over some interactive keys with descriptions and illustrations.

A reception and sale of book remainders will follow in the Farlow Reading Room.

Sasha at the Farlow

Russian artist **Alexander Viazmensky** (Sasha) will be in Boston and plans to attend the FOF meeting. He will have some of his recent mushroom "portraits" with him for perusal and sale at the reception.



Clara Cummings Walk May 1, 2004

The spring FoF Clara Cummings Walk enables local members to gather, shake off the New England winter, jump start the field season and cross pollinate, so to speak. This year's walk was held in the Manchester and Essex Wilderness Conservation Area, Manchester by the Sea, Essex County, MA, a site that includes a red maple swamp and mixed hardwood stands growing on granite ledges dotted with glacial erratics. Although a little early for "mushroom hunting," members of both the FOF and the Boston Mycological Club, Donald Pfister, David Hewitt, Toby Feibleman, Milton Landowne, Fay Fairweather, Barbara Weinstein and Kitty and Peter Griffith came for a chance to stretch their legs and learn about bryophytes with Mary Lincoln and lichens with Douglas Greene, Scott LaGreca, Elizabeth Kneiper and Phillip May. Two members of the New England Wild Flower Society, Elly Andrews and Deborah Lievens, and Keith Babuszcak, a guest, were especially interested in the lichen diversity.

Erika Sonder, the Assistant Curator of Vascular Plants for the New England Botanical Club, arranged for Elizabeth Kneiper to do follow-up lichen walk on June 5, 2004 for the NEBC to accompany Jim Hinds' talk, "New England lichens: Ecology, distribution, and changes in abundance during the last 100 years" given at the June 4, 2004, NEBC meeting. A list of the lichen species seen on the NEBC walk and a summary of Jim Hind's talk can be found at <http://www.huh.harvard.edu/nebc/Meetings.html>

Fay Fairweather identified *Xeromphalina campanella* on the walk, Don Pfister identified *Multiclavula mucida* and Douglas Greene and Elizabeth Kneiper identified the following lichens along the +/- 2 mile trail

taken through the red maple swamp and surrounding uplands:

Acarospora fuscata (Nylander) Arnold
Amandinea punctata (Hoffman) Coppins & Scheidegger
Arthonia radiata (Persoon) Acharius
Aspicilia cinerea (L.) Körber
Biatora longispora (Degelius) Lendemer & Printzen
Bryoria furcellata (Fries) Brodo & D. Hawksworth
Buellia stillingiana J. Steiner
Caloplaca citrina (Hoffmann) Th. Fries
Candelaria concolor (Dickson) Stein
Candelariella aurella (Hoffmann) Zahlbruckner
Candelariella efflorescens R. C. Harris & W. R. Buck
Cetrelia chicitae (Culberson) Culberson & C. Culberson
Cladonia apodocarpa Robbins
Cladonia arbuscula (Wallroth) Flotow
Cladonia coniocraea (Flörke) Sprengel
Cladonia cristatella Tuckerman
Cladonia furcata (Hudson) Schrader
Cladonia grayi Sandstede
Cladonia macilenta var. *bacillaris* (Genth) Schaerer
Cladonia mitis Sandstede
Cladonia parasitica (Hoffmann) Hoffmann
Cladonia pleurota (Flörke) Schaerer
Cladonia rangiferina (L.) F. H. Wiggers
Cladonia rei Schaerer
Cladonia squamosa Hoffmann
Cladonia uncialis (L.) F. H. Wigg
Dimelaena oreina (Acharius) Norman
Diploschistes scruposus (Schreber) Norman
Evernia mesomorpha Nylander
Flavoparmelia baltimorensis (Gyelnik & Főriss) Hale
Flavoparmelia caperata (L.) Hale
Graphis scripta (L.) Acharius
Hypocenomyce scalaris (Acharius) M. Choisy
Hypogymnia physodes (L.) Nylander

Imshaugia aleurites (Acharius) Meyer
Lasallia papulosa (Acharius) Llano
Lecanora caesiorubella subsp. *prolifera*
 (Fink) R. C. Harris
Lecanora dispersa (Persoon) Sommerfelt
Lecanora hybocarpa (Tuckerman) Brodo
Lecanora strobolina (Sprengel) Kieffer
Lecanora symmicta (Acharius) Acharius
Lecanora thysanophora R. C. Harris
Lepraria lobificans Nylander
Lepraria neglecta (Nylander) Erichsen
Melanelia subaurifera (Nylander) Esslinger
Micarea erratica (Körber) Hertel, Rambold
 & Pietschmann
Mycocalicium subtile (Persoon) Szatala
Ochrolechia arborea (Kreyer) Almborn
Parmelia squarrosa Hale
Parmelia sulcata Taylor
Pertusaria amara (Acharius) Nylander
Pertusaria ophthalmiza (Nylander) Nylander
Phaeocalicium polyporaenum (Nylander)
 Tibell
Phaeophyscia rubropulchra (Degelius)
 Moberg
Physcia millegrana Degelius
Physcia stellaris (L.) Nylander
Platismatia tuckermanii (Oakes) Culberson
 & C. Culberson
Porpidia albocaerulescens (Wulfen) Hertel &
 Knoph
Porpidia macrocarpa (DC) Hertel & A. J.
 Schwab
Psilolechia lucida (Acharius) M. Choisy
Punctelia rudecta (Acharius) Krog
Pyrenula pseudobufonia (Rehm) R. C. Harris
Pyrrhospora varians (Acharius) R. C. Harris
Rhizocarpon grande (Flotow) Arnold
Rhizocarpon hochstetteri (Körber) Vainio
Rinodina ascociscana (Tuckerman)
 Tuckerman
Ropalospora chlorantha (Tuckerman) S.
 Ekman
Rhizoplaca subdiscrepans (Nyl.) R. Sant.
Sarcogyne clavus (DC) Kempelhuber
Stereocaulon saxatile H. Magnussen

Trapeliopsis flexuosa (Fries) Coppins & P.
 James
Trapeliopsis viridescens (Schrader) Coppins
 & P. James
Umbilicaria mammulata (Acharius)
 Tuckerman
Umbilicaria muehlenbergii (Acharius)
 Tuckerman
Usnea hirta (L.) F. H. Wiggers
Usnea subfloridana Stirton
Xanthoparmelia conspersa (Acharius) Hale
Xanthoparmelia somloënsis (Gyelnik) Hale

Nomans Land Study

This summer Elizabeth Kneiper joined Stephanie Koch, a wildlife biologist for the Eastern Massachusetts National Wildlife Refuge Complex on two trips to Nomans Land Island National Wildlife Refuge, a 628 acre island located 3 miles south of Martha's Vineyard, MA. Established as a sanctuary for migratory birds in 1998, Nomans Land is one of eight National Wildlife Refuges in Eastern MA. Nomans Land is closed to the public because between 1942 and 1996 the island was used for aerial gunnery by the U. S. Navy. Access to sites on the island is limited to small areas known to be cleared of ordnance. Breeding land bird, marsh bird and migratory bird surveys are done on the island. Stephanie Koch and her crew are attempting to control the spread of invasive plants such as autumn olive, purple loosestrife, Japanese honeysuckle, white poplar and asiatic bittersweet. Elizabeth is developing a lichen checklist for Nomans Land and noting the impact of nesting birds on lichen colonization.

