The Vasculum

The Society of Herbarium Curators Newsletter
Volume 11, Number 2 - July 2016

FROM THE EDITOR

It is with great sadness that I report the passing of John Mervin Herr, Jr. on June 19, 2016. To say that John had an impact on The Society of Herbarium Curators is the ultimate understatement, as he was not only a founding member, but a driving force behind its formation. However, John's involvement did not stop there, he put together the Constitution and Bylaws that govern our Society. And, he proposed the name for our newsletter, *The Vasculum*! On a personal note, John was always tremendously supportive and encouraging to me in my capacity as Editor. During SHC's early years, John once pulled me aside at an annual meeting and stated that in his opinion, the newsletter *was* the organization, and really what kept it going. That was John… loyal and kind, and a true gentleman scholar. Our thoughts and prayers go out to Lucrecia and John's family, and to all those who knew and loved John. John's colleague and friend, John Nelson has written a brief obituary that appears on the website of the University of South Carolina's Department of Biological Sciences.

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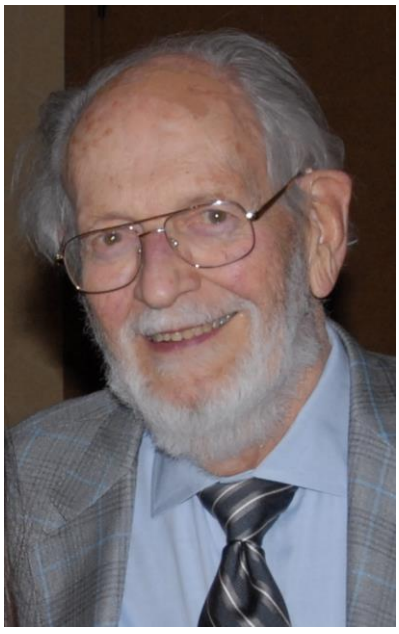

John M. Herr, Jr. (1930-2016)

SHC NEWS

A Message from the President

I am penning this message a few days after our annual SHC meeting in Savannah, Georgia. As of August 1st, I have moved to the position of Past-President. A new slate of officers has been elected by the membership, including our new President, Austin Mast; Treasurer, Mare Nazaire; and Executive Board Member-at-Large, David Tank. Welcome onboard! I want to thank Dale Kruse for his years of service as Treasurer and Rebecca Dolan for leading the Grants committee this year.

In my final message, I want to leave you with a brief review and positive look ahead. SHC is in good-standing. In the past two years, we've formalized our non-profit status, centralized our administrative records for better management, built an attractive and functional website for online membership renewal, and continued to build a supportive community for herbarium curators. Our August 4th herbarium symposium, "Demonstrating the value of herbaria to decision-makers," co-sponsored with the American Society of Plant Taxonomists exemplified the benefits of working together. Registration for this event filled quickly, and 45 students, early-career and established curators attended. We were treated to a panel of eight talks from a diversity of curator's perspectives: from executive-level best-management practices, to the virtues of creating reference collections for outreach, to driving undergraduate participation in myriad creative ways. These shared ideas and the open atmosphere among audience members generated much conversation and a number of take-home plans. One student expressed an interest in seeing a collections-training workshop offered as part of Botany2017. In short, the momentum generated by the symposium is a credit to SHC and an encouraging start to a new administrative year.

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HERBARIUM NEWS

Featured Herbarium: MEL - The National Herbarium of Victoria

History of the Herbarium - Victoria's first Government Botanist, F.J.H. von Mueller (Fig. 1), began the National Herbarium of Victoria in1853. Later on, he persuaded the Victorian government to fund a facility, which still houses the collections in its current location at the Royal Botanic Gardens Victoria (RBGV) in Melbourne, Australia (Fig. 2). The collections (Fig. 3) increased at a rapid pace during von Mueller's tenure as director, and are still actively growing through various staff research projects, voucher collections by the Victorian Conservation Seedbank staff, acquisition of herbaria, and exchange programs with all Australian and many international herbaria. MEL currently houses ca. 1.5 million specimens of cultural, historical, and scientific importance, which makes it one of the larger herbaria in Australia. Due to von Mueller's far reaching and extensive collaborations, MEL is particularly rich in historical collections from the 19th century, has substantial holdings of non-Australian specimens from all other continents, and is a depository for essential occurrence records documenting the flora of the state of Victoria over time.

Figure 1 - The founder and first director of the National Herbarium of Victoria, F.J.H. von Mueller.

Figure 2 - The National Herbarium of Victoria (MEL) building at the Royal Botanic Gardens Melbourne.

Figure 3 - Curation Coordinator Catherine Gallagher filing specimens.

Since von Mueller was born in Germany and pursued his university degree there, he had many European connections who sent him material from all over the world. For example, many holotypes from Berlin-Dahlem (B) destroyed during the second World War have isotopes at MEL, because they were part of Otto Sonder's herbarium that was purchased by his friend von Mueller. Sonder's ca. 250,000 collections arrived in 1883, were unfortunately not catalogued in detail then, and many remain as unmounted collections in strawboards until today (Fig. 4). Another example of an important set of duplicates

deposited at MEL are types from Hawaii that W.B. Hillebrand sent to B which were also lost and are now only available at MEL. Due to von Mueller's local collaborations, MEL also holds most specimens of important expeditions throughout Australia including those by Giles, Leichhardt, Labillardière, Stuart, Sturt, as well as specimens collected by J. Banks and D. Solander as part of Cook's Endeavour voyage (1769-1771), R. Brown accompanying M. Flinders' circumnavigation of Australia (1808-1805), and collections by H. Beckler as part of Burke and Wills' Victorian Exploring Expedition (1860-1861) (Fig. 5) and the various Relief Expeditions that were sent to recover the expedition parties. These historical collections include many types and records of endangered or now extinct species. Von Mueller also worked with a large network of Australian women botanists who sent specimens to him from all corners of the continent (Maroske & Vaughan 2014). These MEL collections are important historical records for the early role of women in Australian plant research. Von Mueller was a prolific collector himself and described more than 2,500 species of plants. In addition, it may not be widely known that MEL has substantial collections of algae, bryophytes, fungi (Fig. 6), lichen (Fig. 7), and pteridophytes, many of which are also historical.

Figure 4 - Unmounted, historical specimens stored in their original strawboards.

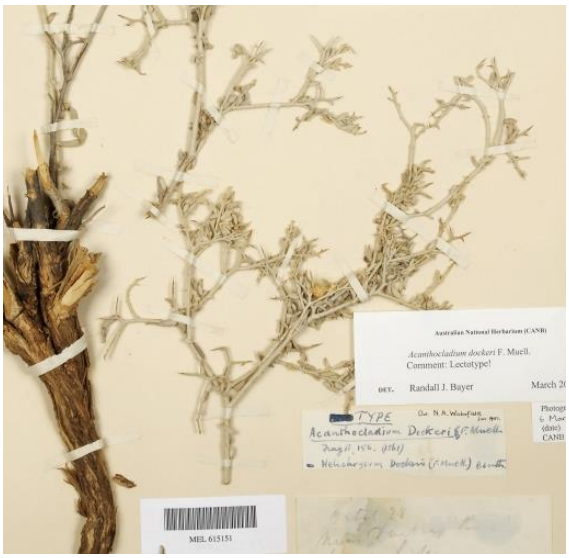

Figure 5 - A specimen collected during the Burke and Wills Victorian Exploring Expedition (1860-1861).

Figure 6 - A collection of Cordyceps growing on cicadas.

Figure 7 - An example of MEL's extensive lichen collection.

At present, one of the main goals for current MEL Collections staff is to make these collections more widely available through digitization projects. For example, staff working on the Foreign Collections project aim to make the ca. 400,000 specimens of non-Australian material available to researchers, because these accessions have been more or less inaccessible for more than 150 years, since many are unmounted and stored in strawboards. These non-Australian collections are potentially rich in types because many are from the 19th century. For example, databasing, imaging and painstaking curation ef-

forts of the non-Australian Fabaceae specimens led to the identification of 320 types (many by C.F. Ecklon and C.P.L. Zeyher) and generated a list of additional potential types. Most of the identified Fabaceae types were from Africa, followed by those from South America, temperate and topical Asia. This digitization project highlighted how many of these important specimens were not easily accessible to international workers from the specimen's country of origin. The effort to post these non-Australian records online has been likened to repatriating specimens digitally.

Structure of the Organisation - The National Herbarium of Victoria under the direction of the Chief Executive Tim Entwisle includes a Plant Sciences and Biodiversity branch (PS&B) led by David Cantrill and a Collections branch led by Pina Milne. The format for e-mail addresses for RBGV staff is: first name.last name@rbg.vic.gov.au. PS&B has ten permanent staff including two mycologists and one freshwater algae specialist, plus five staff working on temporary projects. The Collections branch has seven permanent staff and three working on temporary projects such as digitization of the Foreign Collections project and the Imaging project. The library is overseen by an additional permanent staff member, Sally Stewart. These ancillary collections and the specimens held at the National Herbarium of Victoria together constitute the State Botanical Collection. The library also had its beginnings through von Mueller, since his personal collection of botany texts were the foundation of the now extensive library collection.

The National Herbarium of Victoria is a member of the Council of Heads of Australasian Herbaria (CHAH), which is an organization that facilitates resource sharing and promotes a unified approach to collections management across Australian and New Zealand herbaria. CHAH initiated the digitization of specimen holdings across Australian herbaria and gives access to label information and distribution data via the online portal Australia's Virtual Herbarium (AVH).

Volunteers at MEL - Volunteers, affectionately called Voles, are an integral part of the work that is accomplished at the herbarium. At any given time, 30-35 volunteers help with curation tasks, and there is a wait list for those interested in donating their time and skills to the herbarium. Voles can also gain a diversity of skills at MEL and are responsible for mounting most specimens. Some are also involved in incorporating the mounted specimens into the collection after they have been databased.

Volunteerism can take on many forms at MEL, and those offering particular skills might work closely on a tailored project with Collections staff. For example, a volunteer, who works as a restoration professional, did a detailed damage assessment of a valuable 19th century collection of Araliaceae from Papua New Guinea, which had been damaged by fire while out on loan, and gave recommendations for restoration of the collection once funding is secured. Restoration of another historical collection of Characeae nearly destroyed by a herbarium fire while out on loan (Wood & Williams 1967) has been achieved. Approximately 100-120 specimens including types were preserved and professionally restored (Fig. 8). These restorations were funded by donations, and are now accessible via the Global Plants Initiative online. Other special projects involving volunteers include translating correspondence by von Mueller to various collectors and working on handwriting samples by various collectors.

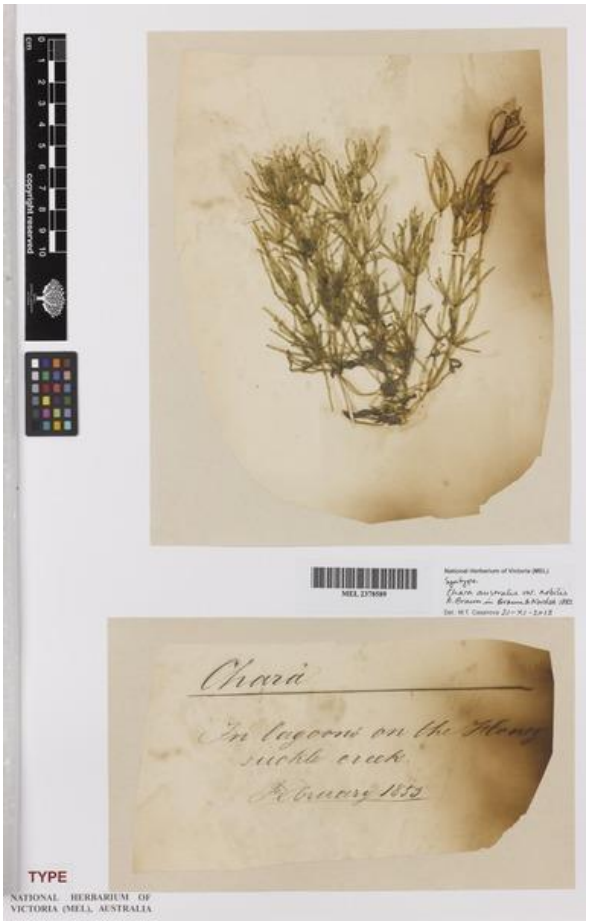

Figure 8 - A Chara type restored after fire damage (note burnt edges of original card).

Physical Collections - Most of the ca. 1.5 million specimens of algae (ca. 46,000 specimens from all continents and oceans), bryophytes (ca. 73,000 specimens including 760 types), fungi (more than 100,000 specimens), lichens (ca. 57,000 with ca. 500 types), and phanerogams that MEL houses are from Australia, and in particular from the state of Victoria. Approximately one third though are non-Australian specimens, many of which are early collections from the 19th century. For example, the Foreign Collection includes ca. 250,000 sheets of O.W. Sonder's herbarium, which comprises some of the earli-

est known collections from South Africa and South America. These were used for the Flora Australiensis and Flora Brasiliensis treatments, include Thunberg's Ericaceae types, and also have a substantial component of algal, bryophyte, fungal, and lichen specimens.

The collection at MEL is organized according to the Cronquist system and will likely migrate to the APG IV system once new facilities are available to house the herbarium. MEL has ca. 3,400 types with more being found through various databasing projects. The herbarium loans or exchanges total ca. 20,000 specimens per year. Australia has strict importation laws due to costly problems (both monetarily and in terms of decline of native biodiversity) with invasive exotic species, pests and diseases and to ensure that CITES regulations are followed. Anyone intending to ship specimens or silica gel material to MEL must first contact the Collections Manager to obtain the appropriate paperwork and guidelines for such shipments.

Collection Highlights - In addition to early Australian specimens from Banks, Solander, and von Mueller, MEL houses a number of important collections from further afield. These include specimens of Hillebrand, Sieber, Sonder, von Martius, and may others. Checking an Australian herbarium might not be an obvious choice for some of these accessions or to locate type material from Africa or Europe, but since von Mueller was sent specimens from all over the world, it is worth checking MEL for types that cannot be located elsewhere. This is not only the case for angiosperms, but also holds true for algae, and in particular Rhodophyta, bryophytes, lichens, fungi, and pteridophytes. For example, the fungorium holds an important collection of ca. 7,000 wood-decay fungi from all parts of Australia and New Guinea, which resulted from extensive timber pathology research at the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and is now permanently housed at MEL. Also, in particular, the 250,000-330,000 sheets of the truly impressive Sonder herbarium continue to be a rich source of exciting material for all of these groups. Von Mueller thought it to be the most diverse private herbarium in existence in his time and worked hard to find the funding to acquire it after Sonder's death. Previous projects, such as the Foreign Fabaceae project, show that much remains to be discovered within the Sonder herbarium once funding is available to catalog, mount, curate, image, and database all specimens. For example, the herbarium has records of plants, such as *Erica pyramidalis* Ait. (Fig. 9) that are now thought to be extinct in the wild, and some species, such as *Calophyllum macrophyllum* Scheff. are known only from MEL's type collection.

Further significant historical collections from Australia were researched by Maroske & Vaughan (2014) who identified at least 225 female botanists who collaborated with von Mueller by sending him specimens from most Australian states and territories (so far no records have been located for the Northern Territory) to help him amass material for his planned first flora of the continent. Eventually, Bentham took over this project and von Mueller loaned thousands of sheets, including those by female collectors, to Bentham, who used them for the Flora Australiensis treatment. Maroske & Vaughan (2014) had to solve many problems surrounding the identity of these female collectors, which could only be achieved through the ever increasing availability of digitized birth, marriage and death records, and newspaper clippings (von Mueller advertised in newspapers for specimens to be sent to him at MEL).

Figure 9 - A specimen documenting the previous distribution of the extinct Erica pyramidalis Ait.

Similarly, databasing herbarium collections yields rich layers of information to the specimen data when puzzles regarding the origin of a specimen have to be worked out. A collection by 'J. Hooker' from Jamaica was such a case, since it was known that Joseph Dalton Hooker never visited Jamaica. Research into Hooker's family history uncovered that J.D. Hooker had an older brother William Dawson Hooker, who did live in Jamaica. The elder Hooker was also a physician and a naturalist and must have sent specimens to his brother in London.

Digital Collections - Australia's herbaria, and in particular MEL, were early adopters of specimen digitization

(Fig. 10) to facilitate the extraction and analysis of label data, plot plant distributions, and to make their collections more readily available via the internet. These records are served through the AVH portal, which is hosted by the Atlas of Living Australia (ALA) project. ALA is a powerful online tool for mapping and analysis of occurrence data and allows export of multiple layers of specimen associated information. For example, it is possible to plot distribution data of the species in a given area, map species using various information layers such as elevation, mean annual temperature, and annual precipitation, or to generate a field guide for selected species. ALA usage data show that MEL specimens are mainly used by biosecurity officers at governmental agencies, citizen scientists, conservation managers and consultants doing environmental assessments, systematists and taxonomists, teachers, and others. Specimen scans are available through the Global Plants Initiative portal on Jstor, and institutions with a subscription to Jstor have access to high resolution images, often of sufficient quality for research requirements. This immediate access speeds up taxonomic work and lessens wear and tear of specimens through shipping.

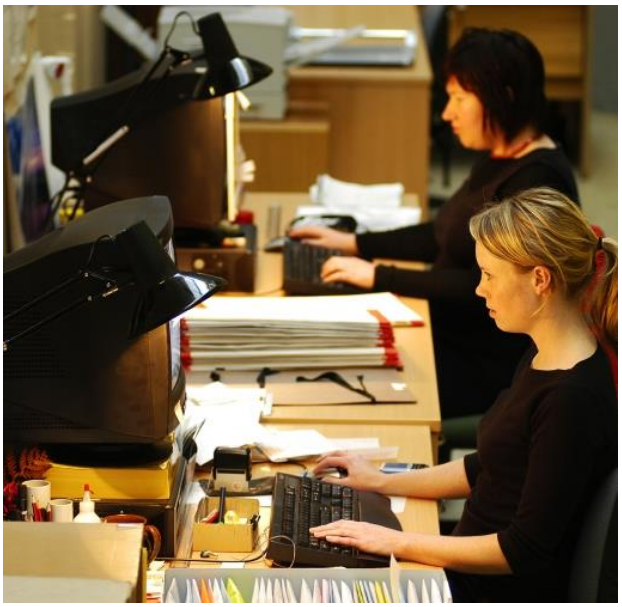

Figure 10 - Collections Information Officer Alison Vaughan databasing specimens.

Approximately 60% of MEL's entire collection and ca. 90% of the Australian component have been databased to date. MEL's type collection was digitized first as part of the Global Plants Initiative project, and databasing of all Australian and ex-Australian types has been completed. To fill the gap in availability of non-Australian specimens, the Royal Botanic Gardens Foundation Victoria and the Director Circle are funding a project to digitize a large portion of the ex-Australian collections, and to date 139 types have been identified through this work. Currently, families 1-76 (Winteraceae-Polygonaceae) of the Cronquist System are being processed, with funding for the remainder to be secured in future.

The effort to database the collections and the careful checking of specimen data and synonomy beforehand have uncovered many types buried in the collections, and their number increased from 1798 types known before databasing to ca. 3,400 holotypes and lectotypes at MEL. For example, for angiosperms 32 Annonaceae types were known before databasing began vs. 120 now, 243 are now listed for Lauraceae vs. the initial 40, and Myrtaceae has increased to 320 from 57. Staff is systematically working through the collection and currently Australian Ranunculaceae (194 in the Cronquist System) are being databased. The approximately 32,000 lichen specimens of Australian origin have all been databased, as have all pteridophytes. All Australian bryophytes at MEL also have been databased, but many non-Australian collections remain unmounted and are therefore not databased nor easily accessible for research. It is clear though that this collection includes many important accessions, since specimens of F.W. Sieber (Fig. 11) were found as part of the Sonder herbarium.

Figure 11 - One of F.W. Sieber's bryophyte collections found within O. Sonder's herbarium.

Future projects for collections digitization at MEL involve the development of resources for referencing handwriting samples and label information of older collections, which often take a substantial amount of time and detective work to decode. It is also planned to add more expeditions (e.g.: von Mueller took part in Gregory's expeditions) to the Global Plants Tracing Expeditions project, since specimen records are so rich at MEL. This includes the addition of further layers of information such as images, illustrations (Fig. 12), and correspondence between explorers and herbarium staff.

Flora of Victoria Goes Digital - The VicFlora project makes available online the essential and much loved book version of the Flora of Victoria (Foreman & Walsh 1993; Walsh & Entwisle 1994, 1996, 1999). The website

serves updated information available in the printed volumes including currently accepted names of the 4,100 species described in the flora and adding those ca. 1,000 species newly described since its publication. Since 2014, these new species are being added to VicFlora through a three year project funded by The Royal Botanic Gardens Foundation, the Commonwealth Government's Bush Blitz Tactical Taxonomy scheme and RBGV. The VicFlora portal serves a taxon profile page including descriptions, identification keys, checklists, and other useful tools such as a glossary. Eventually, high resolution images, illustrations and specimen scans will accompany all species descriptions.

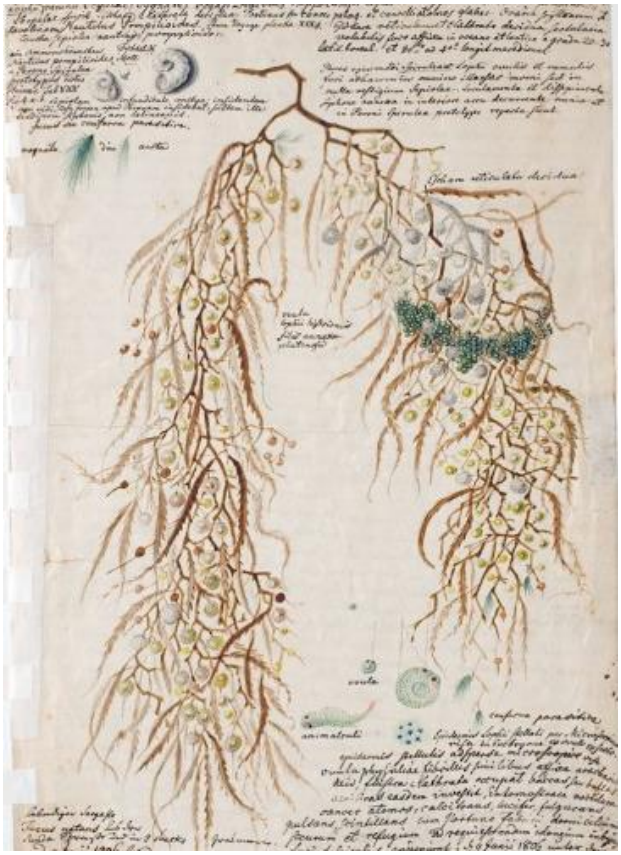

Figure 12 - An illustration included in O. Sonder's material.

Fieldwork and Seedbank - Herbarium staff actively develop the collections through fieldwork for research projects such as biogeography and phytogeography of Southern Hemisphere plants, conservation genetics projects, and systematics work on *Acacia*, Asparagales, *Angophora* and *Corymbia*, macrofungi such as *Cortinarius* and truffles, Poaceae, Proteaceae, Rutaceae, and several more. Collection Improvement Field Trips involving all herbarium staff also take place every two years. These collection enrichment trips target a geographic area in the state of Victoria for which the herbarium needs more extensive records to document the state flora. During each field trip, Collections staff support botanists by databasing the newly generated collections in the field. These trips also generate silica gel material for molecular research and photos for the VicFlora portal.

The Victorian Conservation Seedbank is the local chapter of Kew's Millennium Seed Bank Project, and herbarium staff collect, process and curate seeds of endemic, rare and threatened species of the state flora. These are documented through herbarium vouchers accessioned at MEL. The seeds are kept in long-term storage both at the Royal Botanic Gardens Kew and the RBGV, and are sometimes used for restoration projects. Seeds for restoration projects are propagated at the Royal Botanic Gardens nursery.

Contributions to Conservation Work - Many staff members at MEL have long been involved in applied research and plant conservation programs, and Noushka Reiter and Marc Freestone at the newly established Orchid Conservation Program study rare and threatened orchids in Victoria including their ecology and mycorrhizal associations. They are also involved in the propagation and re-introduction of more than 20 species of threatened orchids.

The Australian Research Centre for Research Ecology (ARCUE) is also affiliated with the RBGV and specializes in research about the restoration of urban and suburban areas and the management of biodiversity found there.

Mycological Research - In addition to plant science, MEL has a strong focus on mycological research and two mycologists are on staff, who maintain a substantial collection of macrofungi. These are a largely understudied group with much diversity to discover still. Teresa Lebel and Tom May's research projects include work on invasive ectomycorrhizal fungi, interactions between plants, gall midges, microfungi and parasitoid wasps, and the systematics and biogeography of macrofungi from Australia and New Zealand. They are also responsible for maintaining the National List of Australian Fungi, which includes current names, synonomy and citations for ca. 3,000 fungi. Since few Australian fungi are listed for conservation, MEL mycologists work on raising the profile of this group to improve their inclusion in conservation schemes.

MEL hosts the citizen science project Fungimap, which is aimed at increasing knowledge about the systematics and ecology of Australian fungi. People involved in Fungimap have developed excellent identification tools including an online field guide and an image collection of fungi that occur in Australia, and citizen scientists can log their fungi sightings on the website. Another identification tool for keying out fungi called FunKey (Fig. 13), which was developed using Lucid software, is available either as app or USB version through Fungimap.

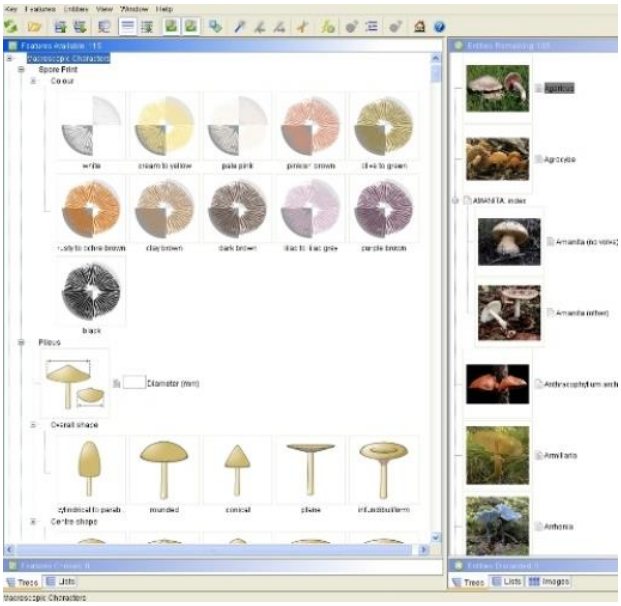

Figure 13 - Screen shot of the FunKey identification tool for keying out Australian macrofungi.

Plant and Fungi Identification Services - MEL offers identification services of cultivated and native plants and fungi to the public, governmental agencies and other organizations, and consultants. This service also includes information on classification, nomenclature, and distribution of the plants in question. Staff mycologists are on call for cases of poisonings where immediate and accurate identification of the ingested fungi is essential.

Laboratory Facilities, The Maud Gibson Laboratory for Molecular Research - The herbarium includes a molecular laboratory to facilitate molecular systematics or population genetics research by staff. This facility is also used for teaching through supervised student research projects. This is often the first time students, who are recipients of the Jim Willis studentship, learn molecular techniques. The lab is equipped for DNA extractions and quality assessment, polymerase chain reactions and electrophoresis of results, and cloning.

Botanical Art - The herbarium does not have a botanical illustrator on staff, but Helen Aston, best known for her work on Australian aquatic plants, produced many illustrations for this group at the RBGV. In addition, the library holds a significant collection of illustrations and botanical art. The beauty of the mounted specimens occasionally inspires the art work of interior and textile designers, and several lines of furniture, clothing and other objects have been based on MEL specimens.

Publications - Since 1955, the herbarium produces its own annual publication called Muelleria. The journal specializes in contributions to Southern Hemisphere systematics research and especially Australian botanic and mycological work. Please contact Teresa Lebel, the current Editor in Chief, for contributions to Muelleria.

References:

Foreman, D.B. & Walsh, N.G. (1993). *Flora of Victoria*, vol. 1. Inkata Press, Melbourne.

Maroske, S. & Vaughan, A. (2014). *Muelleria* 32: 92 - 172.

Walsh, N.G. & Entwisle, T.J. (1994). *Flora of Victoria*, vol. 2. Inkata Press, Melbourne.

Walsh, N.G. & Entwisle, T.J. (1996). *Flora of Victoria*, vol. 3. Inkata Press, Melbourne.

Walsh, N.G. & Entwisle, T.J. (1999). *Flora of Victoria*, vol. 4. Inkata Press, Melbourne.

Wood, R.D. & Williams, M.B. (1967). Australian Characeae which survived the Armidale Fire. *Muelleria* 1: 175 - 196.

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GA Herbarium Hosts NSF-Funded Workshop on Herbarium Techniques (May 2016)

Traditionally trained herbarium curators are lamenting that proper specimen preparation and curation is rapidly becoming a lost art as newly assigned curators are increasingly from laboratory-based programs rather than having a background in field work and collections management. To address this issue in Georgia, Wendy Zomlefer, Curator of the University of Georgia Herbarium (GA), applied for NSF funding for a workshop on "Herbarium Specimen Curation and Best Practices." The goal: to bring together a group curators (and other herbarium personnel) of various levels of expertise to share experiences and instruction about herbarium best practices - mainly collecting, pressing, and mounting plants and what comes after with digitization efforts.

The workshop was held 19–21 May 2016 at the GA Herbarium in conjunction with the fourth Georgia Herbarium Alliance meeting (see Zomlefer 2010, 2012, 2014). The 26 participants (Fig. 1) included curators, collections managers, and students (plus an NSF program officer!) from 17 institutions in seven Southeastern states. The schedule was designed with a variety of activities (presentations, demonstrations), interspersed with time allotted for discussion and feedback.

Figure 1 - Group photo of workshop participants, posing in the Jaworski Amphitheater, UGA Campus. From left to right, back row: Somer Rowe (GA), Alan Franck (USF), Brad Ruhfel (EKY), Thomas McFadden (EKY), Jason Comer (GA), Alexander Krings (NCSC), Philip Lowe (VSC), John Schenk (GAS), Zack Murrell (SERNEC, BOON), Roland Roberts (NSF), David Morgan (WGC); second row: Stephanie Harvey (GSW), Aliya Donnell (Reinhardt Univ., GA), Yonnie Williams (GSW), Ashley Morris (MTSU), Emily Gillespie (MUHW), Richard Carter (VSC), Anne Alerding (VMI), Kent Perkins (FLAS), Cassandra Quave (GEO), Steven Hughes (GA); front row: David Giannasi (GA), Wendy Zomlefer (GA), Thara Samarakoon (GEO), Rechelle Woods (VSC), Melanie Link-Peréz (AASU). Photo credit: Kisha Shelton.

The workshop began with a greeting from the Plant Biology Department Head, Lisa Donovan, followed by presentations by Zomlefer (history of the Georgia Herbarium Alliance; suggestions for herbarium presentations; state funding opportunities) and Richard Carter (overview of VSC Herbarium). The tour of GA Herbarium (Fig. 2) included displays of exemplar specimens from the main collection (Fig. 3), observation of the imaging stations, an overview of the teaching collection, and demonstrations of GA's and VSC's new data and specimen image portals (Carter 2016; Zomlefer and Giannasi 2016; Zomlefer et al. 2014).

The program continued with hands-on specimen mounting (Fig. 4), and Philip Lowe (VSC) and Kent Perkins (FLAS) explained their respective specimen labeling programs (e.g., see Perkins 2007). Roland Roberts, NSF Program Officer (DBI) gave a very well-received presentation on funding avenues for collections, which included pertinent advice on effective grant-writing. The first day ended on a very positive note about collections with Zack Murrell's (BOON) inspirational overview of SERNEC (Southeast Regional Network of Expertise and Collections).

Figure 2 - Wendy Zomlefer (Curator) showing off her own herbarium work area (table and herbarium cabinets) in the specimen processing room of GA herbarium. Photo credit: Richard Carter.

Figure 3 - Display of GA specimens of exemplary pressing and mounting techniques. Photo credit: Emily Gillespie.

The second day of the workshop commenced with a field trip to the State Botanical Garden of Georgia (Fig. 5) to review plant collecting techniques. Richard Carter demonstrated his field press (Fig. 6; see Bryson and Carter 2008) and (scary!) mattock that is an effective tool for gathering clumped and matted graminoids. The group

returned to the lab to share various protocols and helpful hints for pressing specimens (Fig. 7). The workshop culminated with a discussion about the merits of the two-day herbarium practices immersion, and everyone went home with a spiral-bound handbook (e.g., see Carter 2012, Carter et al. 2007; Perkins 2013, 2015) and a GA Herbarium tote bag!

Figure 4 - Mounting demonstrations by Somer Rowe (GA; left) and Rechelle Woods (VSC; right). Photo credit: Steven Hughes.

Figure 5 - Field trip to the native plant garden at the State Botanical Garden to practice plant collecting techniques. Photo credit: Ashley Morris.

Overall, the successful workshop demonstrated a great need of curators (from various backgrounds) for reviewing and/or learning basic specimen preparation and management skills. Also helpful was the opportunity to observe several protocols for accomplishing the same task (e.g., plant mounting). Participants especially appreciated the time slots assigned to discussion and networking, and they craved coverage of even more topics such as packing loans and sorting exchange specimens. Several curators were also inspired by this workshop to start organizing similar events for their own state herbaria.

Figure 6 - Richard Carter (VSC) demonstrating a field press at the State Botanical Garden. Photo credit: Wendy Zomlefer.

A final note on the NSF workshop grants: This program is somewhat different (no formal announcements, rolling deadline, relatively low indirect) compared to other types of NSF proposals. Those readers with a workshop idea should write a one-page summary, and contact the CSBR Program about the feasibility of proceeding with a complete submission.

Acknowledgments:
This workshop would not have been possible without all the presenters: Richard Carter, Lisa Donovan, Steven Hughes, Philip Lowe, Zack Murrell, Kent Perkins, Roland Roberts, Somer Rowe, and Rechelle Woods. Special thanks also go to GA Herbarium folks David Giannasi, Steven Hughes, Jason Comer, and Somer Rowe, who all assisted to make sure this event ran smoothly. Non-UGA participant costs for the workshop were funded by NSF DBI-1521928 (W.B. Zomlefer, PI).

References:

Bryson, C.T. and R. Carter. 2008. A novel design for a light weight and durable field press. *Journal of the Botanical Research Institute of Texas* 2(1): 517-520.

Carter, R. 2012. A cost-effective method for constructing magnetic fumicels for herbarium cabinets. *Journal of the Botanical Research Institute of Texas* 6(2): 579-

582.

Carter, R. 2016 (and ongoing). The virtual herbarium project at Valdosta State University (homepage). Valdosta State University Herbarium, Valdosta,GA. Available at: http://herb.valdosta.edu/.

Carter, R., C.T. Bryson, and S.J. Darbyshire. 2007. Preparation and use of voucher specimens for documenting research in weed science. *Weed Technology* 21: 1101-1108.

Perkins, K. 2007. Plabel: Herbarium label program. University of Florida Herbarium, Florida Museum of Natural History, Gainesville, FL. Available at: http://www.flmnh.ufl.edu/herbarium/pl/.

Perkins, K. 2013. Preparation of plant specimens for deposit as herbarium vouchers. University of Florida Herbarium, Florida Museum of Natural History, Gainesville, FL. Available at: http://www.flmnh.ufl.edu/herbarium/methods/herbariummanagement.htm.

Perkins, K. 2015. University of Florida Herbarium (FLAS). Herbarium methodologies. University of Florida Herbarium, Florida Museum of Natural History, Gainesville, FL. Available at: http://www.flmnh.ufl.edu/herbarium/herbmethods.htm.

Zomlefer, W.B. 2010. First Georgia herbarium consortium meeting, sponsored by SERNEC and GA! *The Vasculum* 5(2): 7.

Zomlefer, W.B. and J.R. Carter. 2012. Second Georgia Herbarium Consortium meeting, sponsored by SERNEC and VSC! *The Vasculum* 7(2): 5.

Zomlefer, W.B. 2014. Third Georgia Herbarium Alliance meeting sponsored by NSF! *The Vasculum* 9(2): 3-5.

Zomlefer, W.B., J.R. Carter, and D.E. Giannasi. 2014 (and ongoing). *The atlas of Georgia plants*. University of Georgia Herbarium (Athens, GA) and Valdosta State University Herbarium (Valdosta, GA). Available at: http://www.georgiaherbaria.org/.

Zomlefer, W.B. and D.E. Giannasi. 2016 (and ongoing). The vascular plant atlas of Georgia. University of Georgia Herbarium, Athens, GA. Available at: http://www.georgiaherbaria.org/atlas/.

Figure 7 - Top: Zack Murrell (SERNEC director; BOON) pressing a voucher for his research; bottom: close-up of Cornus amomum voucher. Photo credit: Wendy Zomlefer.

– Wendy Zomlefer, University of Georgia Herbarium, wendyz@uga.edu

Butler University's Friesner Herbarium Launches Indiana Plant Atlas

The Indiana Plant Atlas (IPA) is an online resource that documents Indiana's wild plants (Fig. 1). Based initially on data from the more than 40,000 specimens housed in the Friesner Herbarium (BUT), the site is growing to include records from other herbaria. Nomenclature is based on Kay Yatskievych's Indiana Vascular Plant Catalogue (soon to be published by IU Press). Images of the herbarium specimens that document species' distributions are present, when available (Fig. 2). Other information on each plant includes rarity and invasive status, coefficient of conservatism and wetness classification values, physiognomy and common name (Fig. 3). County-level check-lists can be downloaded. The IPA also has wonderful photographs of plants taken *in situ* in Indiana by local photographers (Figs. 4-5). Feedback appreciated.

Figure 1 - IPA Banner.

Figure 2 - Herbarium specimen of Filipendula rubra.

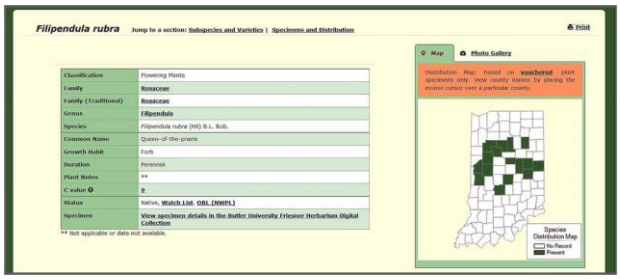

Figure 3 - Screen shot of data map.

Figure 4 - Cypripedium reginae.

Figure 5 - Tradescantia virginiana.

- Rebecca Dolan, Director, Friesner Herbarium, rdolan@butler.edu

New Herbarium at Lincoln Memorial University

The Cumberland Mountain region has a new herbarium. Lincoln Memorial University (www.lmunet.edu) recently added a vascular plant herbarium (LNCN) housed in the Cumberland Mountain Research Center located on their main campus in Harrogate, Tennessee (Figs. 1-3). Curator of Vascular Plants, Steve Furches, has deposited more than 300 species to the growing collection. These vouchers obtained across LMU's 1,000 acre campus (adjacent to the Cumberland Gap National Historical Park) illustrate the campus' rich diversity. These specimens add to the existing 5,500 collections of fungi and slime molds, curated by Adam Rollins. After acquiring and renovating five cabinets from Austin Peay State University (APSC), the facility has plenty of room to grow.

Figure 1 - Home of the new herbarium at Lincoln Memorial University.

Figure 2 - Herbarium cabinets at the Lincoln Memorial University Herbarium.

Figure 3 - Moving in day!

- Steve Furches, Lincoln Memorial University, steve.furches@lmunet.edu

GHOSTS - An Artist's Interpretation of Herbarium Specimens

Dear Colleagues. Thank you for allowing me to call this item to your attention. One of my colleagues here at Illinois State University, Melissa Oresky, took an interest in seeing and exploring our herbarium (ISU) collection. The portfolio book *GHOSTS* (Oresky, 2016, Kayrock Screenprinting, Brooklyn, NY., $30) is the result. It's a collection of 16 prints based on silhouettes of herbarium specimens. The covers of the book and one of the images are presented to give you an idea of the appeal and creativity of this unique book (Figs. 1-3). A single edition of 200 was published, each book is signed and numbered by the artist. If you have an interest you can contact Melissa at melissaoresky.com.

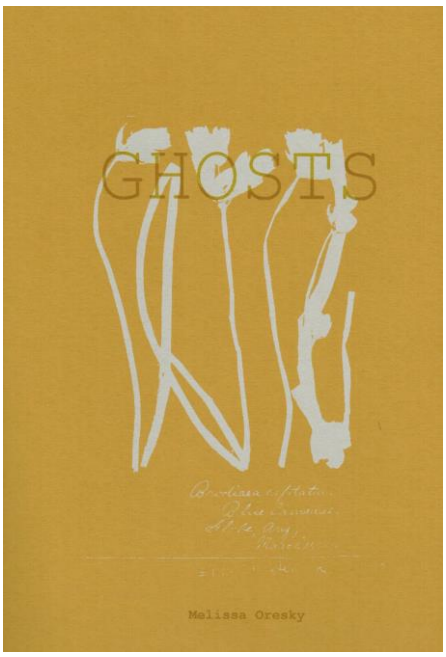

Figure 1 - Front cover of GHOSTS.

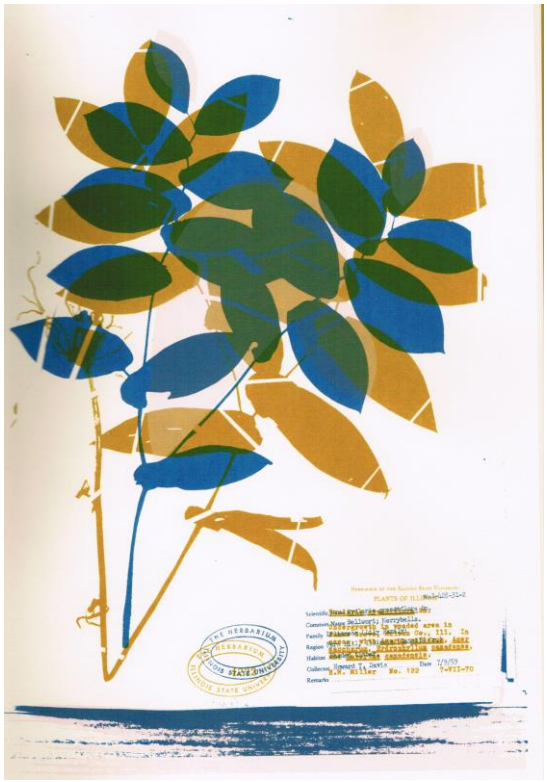

Figure 2 - Sample page from GHOSTS.

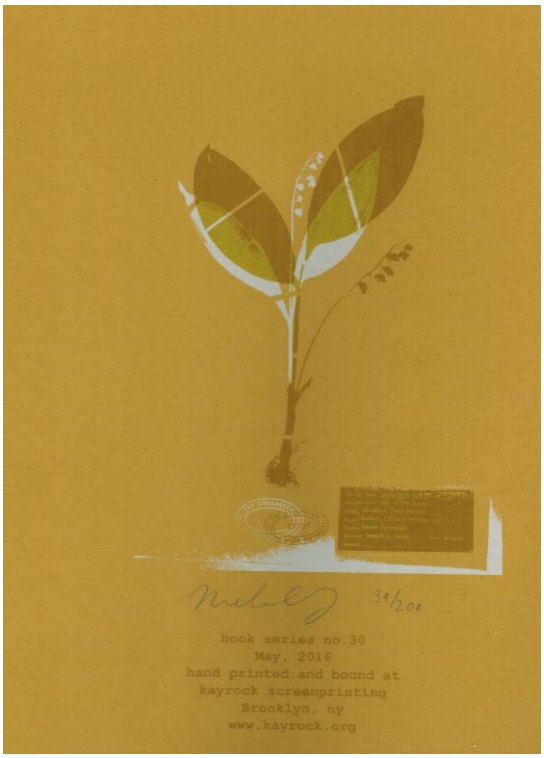

Figure 3 - Back cover of GHOSTS.

- Joseph E. Armstrong, Head Curator of the Vasey (ISU) Herbarium, Illinois State University, jearmstr@ilstu.edu

NAME THAT THING!

Often, I include a "Name that Plant" section in this newsletter. However, this time I'm including something a bit different. Can any of our readers identify the orange "thing" in the photos seen below? It was covering the stump of a tree that had been toppled by a beaver in Smoke Hole Gorge, West Virginia. Email me with your answers!

- Conley K. McMullen, James Madison University, mcmullck@jmu.edu

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