

The Vasculum

The Society of Herbarium Curators Newsletter
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FROM THE EDITOR

Due to the length of this issue's articles, space for the editor's comments is limited. So, I'll simply remind you of the SHC Business Meeting to be held April 3, 2009 in Birmingham, Alabama, at the annual Association of Southeastern Biologists meeting. I hope to see many of you there! The SHC Executive Board Meeting will be held earlier the same day.

- Conley K. McMullen, James Madison University

SHC NEWS

A Message from the President

Dear Colleagues:

A new year has begun, and a new President has been inaugurated. He has recently said a good bit on mobilizing the country, encouraging the actions of individuals toward the betterment of the whole. Indeed, he has plenty on his plate, and by extension, so do we. In this regard, I believe that he was talking to all herbarium curators, far and wide. With this in mind, I have some thoughts to share with you. Please consider these as issues that we can work on through the coming year, and beyond.

1. What is the public perception of herbaria?

I wonder if you went outside your herbarium building and asked the first person you saw on the sidewalk something about their "local" herbarium... what would they say? I think that in most cases, the sidewalker would probably say "What's an herbarium?", thus setting you up for a sermon, and delivering unto them a tract, or hand-out of some sort. I would argue, admittedly without any data available, that most people on the street don't have any idea what an "herbarium" is. Either that, or they would think that it is some kind of greenhouse or arboretum (the common response we get at USCH). Is this important? Yes...and again, admittedly, with the proviso that local public perceptions of YOUR herbarium may have little or nothing to do with its size (collections size, staff numbers, current research, etc.). The way we are

perceived surely varies tremendously, and yet I wonder that we sometimes like to fall back on a kind of crutch, complaining about perpetual "plant blindness" within the public, and our inevitable suffering from it.

Now, some will say that public perception of herbaria, and what we do, is not very important. I would agree that some herbaria are so well off, institutionally and financially, that they don't really need to depend upon the public for support. (And of course if that is true, I wish you a continuity of the best of times!) Most of us, though, and certainly those at state-supported universities or institutions, depend more and more on the direct or indirect involvement of local citizens with what we are doing. Are there ways in which your herbarium can offer assistance to the public? Plant identifications? Are you associated with an active garden (and gardeners)? Is there an endowment program set up for your operations? How can you get the botanical word out to your local community on just how important plants really are? And further, how herbaria are ultimately the best repositories for such knowledge?

Maybe in the future we can also develop a discussion on the perception of herbaria from within... thus, if you walked down the hallway in your building and mentioned to an academic colleague the activities going on in your herbarium, would they say, "What's an herbarium?"

2. What exactly is it that you are curating? Specimens or information?

Some of you have heard me voice this in the past, and I think it warrants a bit of repetition. I consider myself a curator-- one of those paper-and-glue people -- who is reaping the benefits of the modern age, so to speak, in that data-capturing in its various forms is all the... (dare I say it?) "rage". Don't get me wrong: our herbarium is fully committed to the prospect of data-basing our collection. For one thing, NSF likes this. We've been fortunate enough to have a recent flood of expertise develop a fairly sophisticated presentation on the internet of our holdings. And, regionally, we (USCH) are deeply committed to the goals of SERNEC as a data-harvesting mechanism.

My personal perception is that I am a curator of specimens: that seems up-front and obvious. At the same

time, though, our collection is becoming more and more accessible electronically (no images yet, though). Plenty of other herbaria have mastered the imaging of many of their specimens, and this is a wonderful thing, for instance, if you want to see what a certain type looks like. But at what point does the physical collection become irrelevant? Recently, we got a request from an eager young student for location data for all our specimens of a certain genus... something that happens rather often, and a request that can be easily answered by consulting our on-line database. And yet, when I asked if a loan of specimens wouldn't be useful, I was told that the specimens wouldn't be needed until after the systematic research was completed. That is, any annotations of specimens (via loans) should only take place after the science (and taxonomy) has been completed! Wait a minute! I thought that the specimens were part of the science! Such an attitude is surely not malicious, but I fear that it fosters an attitude that could put all herbaria out of business, in a worst-case kind of scenario.

3. The little things are important!

Little things sometimes turn into big things. Here's a suggestion that illustrates this, and speaks to a way in which all of us as curators might look out for each other. Now, some of you know that I try to be active in soliciting annotations for our accessioned material. Generally, my entreaties have been very warmly met, and we are the recipients of many annotations of specimens from "standard" or "straightforward" loans, not associated with formal studies. Apparently, herbarium specimens are not being borrowed/loaned like they used to be, at least according to the number of requests we get. (This may or may not be merely an effect of the "big" herbaria getting most of the loan requests. I don't know.) My feeling is that we curators, as TAXONOMISTS, ought to be offering our services to each other for just such purposes! As long as it is convenient, of course. It goes both ways, so if you feel that your collection may be improved by having portions of it annotated, please be willing to provide the same scientific service for your colleagues, if approached. And, may we not forget that the small, overlooked collections often have material just as important, or often more so, than those of the big collections.

So, a few ideas to consider. I look forward to hearing your thoughts, and I hope you can share them as well with each other. Vivat Linnaeus!

- John Nelson, University of South Carolina

Upcoming SHC Election

An election for one of our at large Executive Board Member positions will take place on April 3, 2009 at the SHC General Meeting in Birmingham, Alabama. Ballots will be handed out and collected at the meeting. Follow-

ing, in alphabetical order, are biographical sketches for our two candidates. The Executive Board thanks these two members for their commitment to SHC, and their willingness to serve as candidates.

Ronald L. Jones received his Ph.D. in 1980 at Vanderbilt University, under the direction of Dr. Robert Kral. He has now completed 27 years at Eastern Kentucky University. He has taught 13 different courses while at EKU, and directed the M.S. degrees of 12 graduate students. He has taught at summer field classes in Tennessee, Mississippi, and Ecuador. He has served at both state and regional levels in professional organizations, and was the founding President of the Kentucky Native Plant Society in 1986. His research has chiefly involved floristics of Kentucky and the SEUS, and he has maintained a steady series of journal articles. His recent book, *Plant Life of Kentucky, An Illustrated Guide to the Vascular Flora*, was nominated for an international award. He has recently begun a floristic research project in Costa Rica. His recent awards include being selected as the 2006-08 EKU Foundation Professor, the 2005 Biological Diversity Protection Award from the Kentucky State Nature Preserves Commission, and the 2003 Naturalist of the Year Award from the Kentucky Natural History Society. Under his direction, the EKU Herbarium has grown from under 10,000 specimens to almost 75,000 specimens. He has also been active in promoting the use of databases as a herbarium management tool, and was instrumental in initiating the development of *Index Kentuckiensis*, which is now used in a number of herbaria across the U.S. He has also given many presentations at meetings on the need to protect our threatened herbarium resources, and hopes to work with SHC to assist curators in making their collections more visible, viable, and valued.

Steffi M. Ickert-Bond - Currently, I hold a joint appointment as Curator of the University of Alaska Museum Herbarium (ALA), where I have been since 2006, and Assistant Professor of Botany at the University of Alaska Fairbanks (UAF), Dept. of Biology and Wildlife. I received my Ph.D. in 2003 in Botany at Arizona State University (ASU) where I completed my dissertation on a revision of New World *Ephedra* under the direction of Donald J. Pinkava and Kathleen B. Pigg. Thereafter, I held the Boyd Postdoctoral Fellowship at the Field Museum, Chicago for two years, where I worked jointly with Jun Wen (Botany and Pritzker Lab for Molecular Evolution and Systematics) and Jenny McElwain (Geology) on phylogenetics and biogeography of the Altingiaceae (sweet gums). I am a native of Berlin, where I obtained my diploma in horticulture (B.S.) from the Technische Fachhochschule. Later, I completed a master's thesis on the biosystematics of the enigmatic *Pinus krempfii* from Vietnam at ASU. I have a long-standing interest in herbarium curation, which began as curatorial assistant at the Botanischer Garten und Botanisches Museum Berlin-Dahlem (B). Later, during my graduate studies I was employed as part-time Assistant Collec-

tions Manager in the ASU herbarium from 1996-1998. In my current position as curator at ALA, I secured NSF-BRC funding to expand our herbarium with the purchase of 116 cabinets, a high-density compactor unit, and production of high resolution images and data of all specimens to be integrated into a state-of-the-art database interlinked with online resources such as MorphBank, GenBank, map servers, and portals (GBIF). One of the areas I would like to continue promoting among members of SHC is herbarium infrastructure building utilizing established protocols and best practices that we have gained from our imaging project here in Alaska.

HERBARIUM NEWS

Featured Herbarium: LSU and LSUM - Louisiana State University Herbaria

A Brief History of the Louisiana State University Herbaria

Founded in 1869 by Americus Featherman (1822-c. 1891), the Louisiana State University Herbarium (LSU) is one of the oldest collections in the Gulf South and is the second largest herbarium in Louisiana. Featherman was an Assistant Examiner for the Confederate Patent Office during the Civil War. Following the war, he became a professor of Botany and Romance Languages at LSU. Hundreds of his plant collections remain housed at LSU and are referenced in one of the first copies of a checklist of plants of Louisiana (Featherman 1871). He collected ten vascular plant holotypes as well as types of bryophytes (Sayre 1977). His collection of *Sarracenia purpurea* L. (Sarraceniaceae) is the only known record from Louisiana (MacRoberts and MacRoberts 2004). Featherman later left LSU and moved to Paris where he worked on other subjects, including cultural anthropology (Featherman 1887+).

LSU, directed by Dr. Lowell Urbatsch, has ca. 116,000 accessions of vascular plants, ca. 3,000 bryophytes, and ca. 40,000 lichens. Over 100 type specimens are found in the collection. The vascular plant and bryophyte collections have a strong geographical emphasis on Louisiana and the Gulf South in addition to collections mainly from the western hemisphere. The lichen collection was largely built up by Boyd Professor Emerita Dr. Shirley Tucker and has a worldwide representation of specimens, including a large set from Louisiana. The collection is rich in tropical and subtropical crustose lichens.

The Bernard Lowy Mycological Herbarium (LSUM) was founded in 1954 by Dr. Bernard Lowy and is one of the largest collections of its kind in this region with ca. 25,000 accessions. Lowy was a mycologist and ethnobotanist primarily focusing his work on neotropical

fungi. He is well known for his work on documenting Mayan mushroom stones and their uses in rituals (Lowy 1971, 1972). LSUM has many neotropical jelly and wood-decaying fungi and has a sizeable set of diverse collections from the Baton Rouge area. There are ca. 50 holotypes in the collection based on Lowy's work. LSUM is curated by Boyd professor Dr. Meredith Blackwell.

Due to its long history, the LSU Herbarium includes many old and historically valuable vascular plant specimens. The oldest specimen was made by G.W. Ames in 1834 from Kentucky, *Heuchera villosa* Michx. (Saxifragaceae). Pre-1850 collectors represented in the collection include C.W. Short, G.W. Ames, R.D. Nevius, Allan Dedrick, F. Lindheimer, T.C. Porter, and Frederick H. Billings. Important collectors after the 1850's from the United States and Mexico are Jean Louis Berlandier, Joseph F. Joor, Charles Mohr, and Arthur Schott. Numerous collections made on Ship Island, Mississippi, in 1870 by an unknown collector serve as the earliest known voucher specimens from of Gulf Islands National Park (Urbatsch et al. 2007). There are two early 20th century Louisiana collections of historical relevance. Over 800 specimens of E.C. Wurzelow were collected from the Houma, Louisiana, area from 1913 to 1918. Also, 840 St. Tammany Parish collections were made from 1919 to 1922 by Brother Arsène (Arsène Brouard) of St. Paul's College in Covington. More information on Brother Arsène can be found at the Arizona State University web site (<http://nhc.asu.edu/lichens/general/brouard.jsp>).

The first floristic checklist from Louisiana was published by Rafinesque (1817) based on specimens housed in Paris, and a second list was made by Riddell (1852). Later lists such as Featherman's (1871) were based on specimens located in United States herbaria as well, including LSU. The most recent checklists for Louisiana were published by Thomas and Allen (1993, 1996, 1998) based on voucher specimen data at LSU and other regional herbaria. There is no comprehensive "Flora of Louisiana" for use for identifying plants from our state.

A revitalization of the herbarium in the 1990's was helped by several events. First, in 1991, the herbarium received a large grant from the State of Louisiana to computerize the collections. Dr. Tom Wendt (now at TEX/LL) joined the herbarium in the same year as Associate Director, the first full-time Ph.D. level herbarium staff member at LSU. Dr. Mark Mayfield (now at KSU), and subsequently Dr. Diane Ferguson, continued as associate directors. Second, commissioned by Louisiana State University in 1976, a series of watercolor drawings by the internationally known botanical artist Margaret Stones was published (1991). This work was supported by many local Louisianans and carried out in conjunction with LSU Herbarium personnel. Third, in 1992, the Clair Brown Memorial Endowment was established, being named after the long time director of the LSU Her-

barium from 1927 to 1969 who authored *Wildflowers of Louisiana and Adjoining States* (1972), *Louisiana Trees and Shrubs* (1965), and many other botanical works. This fund is growing through private contributions and provides income entirely for herbarium use. Fourth, LSU has a rapidly growing herbarium library which includes collections donated by Clair Brown, Bernard Lowy, Shirley Tucker, Samuel Meyers, and Florence Givens. Fifth, the vascular plant herbarium has added ca. 55,000 collections since the arrival of the current director of the herbaria, Dr. Lowell Urbatsch in 1975, more than doubling its size since its establishment in 1869. Sixth, the LSU Herbaria and other natural history collections on campus formed a consortium called the “Louisiana Museum of Natural History” or the official state museum as a result of state legislative approval (Louisiana House Bill 826). Together, the museums house more than 2.8 million specimens, objects, and artifacts.



The Life Science Annex building, Louisiana State University, Baton Rouge. The herbarium is on the second floor, completely surrounded by windows.

In addition to increased staff and funding, the university moved the herbarium to a new building, the Life Sciences Annex, completed in April 2001. The ca. 6,600 ft² climate-controlled herbarium complex on the second floor of the seven story building is designed to hold a maximum of 800,000 accessions on a compactor system. Two hundred new double-door Viking Metal Co. cabinets were purchased with NSF BRC funds (award #9987491) and are on the compactor system. The facility (www.herbarium.lsu.edu/facility.html) also includes a separate library space, three research carrels, two offices, a spacious workroom, storeroom, computer room, and a preparation room with a -80°C Thermoforma freezer and a plant drier. Digital facilities include two servers, eight computers, a digital microscope, an oversized graphics scanner, and a digital camera set-up for image capture.

The goal of the LSU Herbarium is to become the premier collection of Louisiana and Gulf Coast plants. The LSU Herbaria are an essential resource for research, teaching, and public service, including the floristic study of the plants and fungi of Louisiana, the ecology of Louisiana marshes, coastal biology, the medicinal plants of the Gulf South, environmental impact assessments in Louisiana, and the conservation of plants throughout the western hemisphere.



One row of the compactor unit at LSU.

In 2002, LSU and LSUM entered into a Memorandum of Understanding (MOU; Agreement #H5028 03 0001) with the National Park Service’s Gulf Coast Network. This is a long term loan agreement, renewable every 10 years, to house permanently the National Park Service’s accessions from the Gulf South region. Currently, the herbarium has on loan thousands of plant and fungal collections from Gulf Islands National Park located in Mississippi and Florida, and from Jean Lafitte National Historic Park and Preserve in Louisiana.

The LSU Virtual Herbarium

LSU and LSUM have a highly modern virtual herbarium (www.herbarium.lsu.edu). To our knowledge, no one else serves a broader range of taxa or has as many features for the user, especially for a state-funded herbarium of our size. Most recently we were funded externally by grants from NSF BRC (award #0346578) and the Louisiana Board of Regents. Also, digitization has been helped along by internal support through use of Dr. Shirley Tucker’s Boyd Professor Emerita’s funds, departmental operating funds, endowments, and salary for a half-time graduate student curatorial assistant. Internal support also pays for departmental computer facilities that maintain our servers and computers and for maintenance of the herbarium space.

In our browser search of over 117,000 keyed-in records in our virtual herbarium, one can search hierarchically by major group or division, families A-Z, genera A-Z, geographic regions, Louisiana parishes, localities within East Baton Rouge Parish, decades, or collectors by last name. If one checks a box for a particular taxon of choice, a list of specimen records matching the criteria is generated to the right of the browser. To the left of each record are two icons, the one on the left indicates whether the specimen has been digitized and the one on the right whether it has geospatial data.

In our wildcard search, category, country, and state are pull down menus. The user does not have to know the precise spelling of a difficult Latin name. If one searches for the family Asteraceae, one need only type in “as” and the selection comes up. This is true for the field family, genus, species, common name, parish/county, locality, catalog number (=barcode), collector, and collector number. Specimens can also be found by a range of selected dates from a calendar date selector (like one would see in Expedia® or Travelocity® when booking flights).

Clicking on one record gives a pop up window of the keyed-in label data for that record or the “General Info”. Here you can find a link to the USDA NRCS (<http://plants.usda.gov>) symbol for that taxon. One can view the “Specimen Sheet” using the Zoomify software (<http://sourceforge.net/projects/zoomifyimage/>) feature to enlarge the image.

One can generate a Coordinate Map using Google Maps for records with geospatial data. In Google Maps the street map, the satellite image, their hybrid, terrain, and the USGS Topo and DOQ maps can be seen. We use Biogeomancer (www.biogeomancer.org) to generate data for records lacking specific GPS data. For over 117,000 records in our database we can only use simple locality names such as “Baton Rouge” to generate geospatial data. Using more complex data present in our database (such as “2 miles west of Baton Rouge”), while more desirable, is not computationally feasible at this time.

Checklists for specific areas can be generated by the user. For example, one can generate a sortable checklist for East Baton Rouge Parish, Baton Rouge, or any other place that can be browsed in the locality browser. Localities can also be compared in the regional biodiversity matrix option.

We are posting all of our photographic images of plants into our image gallery. Images can be filtered by taxon or by selecting predefined character states set by us that are tagged to the image. The upload of images and their tagging is an administrative function and the images are read-only on the front end. The goal is to include simpler tags like “petal color” or “fruit color” to make the image gallery search more user-friendly to a less experienced person, while still including technical characters for advanced researchers.

Fact sheets for Louisiana plant taxa are being created using Fact Sheet Fusion (www.lucidcentral.org). So far, 81 fact sheets are complete and posted on our website. The pages contain a wealth of technical information including images, taxonomy, descriptions, references, and links. These fact sheets, thus far, have been generated by students in plant systematics classes at LSU as semester projects.

Our most recent addition to our website is the incorporation of interactive keys to groups common to the state of Louisiana. To that end, Dr. Ferguson and Tim M. Jones, Ph.D. student at LSU in Biological Sciences, have collaborated to start a Cyperaceae (sedges) interactive keys page (www.herbarium.lsu.edu/keys). The software Lucid3 (www.lucidcentral.org) is used to generate and serve interactive keys online because of its superior ability to handle character data that are continuous in nature (vs. discrete data). The genera *Carex*, *Cyperus*, *Kyllinga*, *Rhynchospora*, and *Scleria* are now published, and *Eleocharis* is the testing phase. The keys cover North America and, in some cases, beyond. Also included in the keys menu is a glossary complete with images of commonly used terms found in the keys.

The latest launch of our website has greatly increased the number of web site hits since the beginning of the NSF BRC project. On 28 October 2008, typing in the word “herbarium” from an LSU computer in Baton Rouge, on a simple Google search, showed LSU as the top listed herbarium. This gives LSU the increased visibility necessary to justify our existence to administrators, potential funding organizations, etc. (Mishler 2008). This increase also implies that the information we provide is of use to the public. Web hit statistics for LSU can be viewed at (www.herbarium.lsu.edu/awstats/awstats.pl). We originally estimated that we received about 1,500-2,000 hits per month prior to 2004. Now, summed across all the pages on our entire site, we received over 100,000 hits per month on average since January 2008.

Collaborative Efforts

It was decided at the outset of our NSF BRC grant to hire a professional contractor to develop the web tools needed and to modernize the look and feel of the website. The project was interdisciplinary between biology and the computer sciences and a university/private enterprise collaborative effort in the end, something not foreseen at the outset of the project. Such collaborative ventures seem helpful to making virtual herbaria a success. We are in debt to our collaboration with our contractor Michael Giddens and his company SilverBiology (www.silverbiology.com), a company launched in part from this grant. The biological webportal SilverCollection, developed by Giddens, drives our virtual herbarium. We are hopeful that his company will grow and start to help other museums establish virtual collections via contractual arrangements.

Caveats and Digitization

There are three main areas that should be considered when planning and starting up a virtual herbarium. They all relate to funding concerns.

1. Labor: It seems much simpler to get funds for enhancement grants than for conventional grants that pay for salary and wages. Currently, we have the equivalent of four full-time staff members running eight relatively new computers, associated digitization equipment, and two servers. As of the end of 2009, we will lose our position of half-time digital image capturer. Especially hard to find is a trained labor force that can wrestle with botanical terminology and nomenclature. A postdoctoral fellow would be ideal, but a person who writes fact sheets or interactive keys as a post-doc may not be as competitive for a high profile university job of their choosing. Hiring graduate student R.A.s or recent college graduates has been more successful for us than untrained undergraduates, even if they lack a science background. The error rate of the work output and reliability is vastly improved.

2. Website and database maintenance: This is a topic we rarely if ever hear discussed in earnest. There are many projects on database building and digital imaging around the world. When the projects are funded, completed, and posted on-line, what happens next? Like the physical specimens themselves, a virtual herbarium is an “active herbarium” and needs continual curation (Nelson 2008). For example, when DMF came to LSU in 2000, the LSU on-line database of ca. 12,000 records ran on Brahms version 4 (www.brahmsonline.com) in MS-DOS, and the database was posted on-line with a minimal wildcard search on a Macintosh computer set up as a server. Those original 12,000 digital records have been actively curated for over the last eight years. The records have been converted from Brahms v. 4 to Brahms v. 5 to Specify v. 5.2.3 (www.specifysoftware.org). Now that we have digital imaging capabilities, those 12,000 records have been imaged. Each time a specimen is annotated, the authoritative data source Specify is updated, and once we resync the webportal the virtual herbarium is updated. Also, the specimen is re-captured in the digital imaging set-up, batch processed, and the old image overwritten. Only then is the specimen refiled into the collection. The same is true for all incoming annotated loan return material. Who pays for this extra curation (mainly extra time)? Our experience is that it gets foisted on the collection manager when there is no external support. People building virtual herbaria, especially at smaller institutions with little support, need to keep maintenance in mind. Also to keep in mind is maintenance of equipment about three to five years after digitization grants expire. At LSU and LSUM, we are already seeking funding to replace some of our current equipment, including some computers and our digital microscope.

3. Reverse data mining (thought of after watching the Monty Python Flying Circus’ television series episode skit “How Not To Be Seen”, but reversed): We agree with Mishler (2008) and Nelson (2008) that herbaria must make themselves more visible, especially to their own institutions, if they are to be indispensable and justify their own existence. It is great to be able to mine other people’s data for your own projects (i.e. Urbatsch et al. 2007). That is why we want other herbaria to post their own data. We can even request specific specimens of interest on loan more easily (Nelson 2008). To sustain ourselves, however, we need to be seen, or we need people to mine (in reverse) our data at LSU and LSUM. We need website hits, preferably globally. We have found that simply posting an image or a specimen record is not enough. Metadata must be added to images, etc., so that it is seen on Google or other search engines to increase hits. Linking to GBIF (www.gbif.org) and other larger portals is another way for your institution to be seen by others. University administrators love web site hits, a.k.a. publicity (Mishler 2008). We try our best to maintain visibility through the press (i.e. Schindler 2005; Griffin 2008), but web site presence is even more effective. My (DMF) *Cyperus* interactive key alone (Ferguson 2008) (www.herbarium.lsu.edu/keys) generates more visibility than any hard copy paper journal article I could ever submit on the genus itself. Between August and October 2008, the *Cyperus* key received 356 hits from all five continents, with the more frequent visitors being in the United States, New Zealand, Australia, United Kingdom, and Canada.

The Future

“Science is another quest to make images of the world. It has different goals, and often requires different skills, but its beginnings had much in common with those of art: the accurate observation and representation of the world. Yet, there is more to the world than meets the eye... The use of imagination to enlarge our picture of reality without, at the same time, subverting it is a delicate enterprise.” - John D. Barrow, *The Artful Universe* (1995)

With research funding on decline both locally (Blum 2008) and nationally (Mishler 2008), the question is where are the LSU Herbaria going in the future in an uncertain time. Ironically, on my (DMF) 2008 annual evaluation, two goals for the next year were written. Although it is my own personal information I think that it is highly illustrative of the current state of herbarium funding:

- “1) Seek new sources of funds for continued [sic] web development.
- 2) “ “ “ “ “ [for] continued collecting.”

My first impression on reading this is that the former would be much easier than the latter and maybe the latter impossible. Who funds broad general collecting, especially in a climate where this type of research is in decline (Prather et al. 2004)? The goals at LSU and LSUM are two-fold and of equal importance: to continue to build up the herbarium collections and to provide a free, on-line source of information to the public via the virtual herbarium. This is especially important to us, as there is no “Flora of Louisiana” for people in our state to use. Will our website metamorphose into a digital state flora? That depends on available expertise, desire, determination, and funding.

It is vital to build and actively curate the collection itself, for without it the virtual herbarium would not exist. We must remind others in administrative and granting positions that collections-based research is of the utmost importance. For example, in our inventory work with the National Park Service we have increased the number of vascular plant taxa known to exist in Jean Lafitte National Park and Preserve, Barataria Preserve Unit (ca. 21,000 acres), by 41%; and Chalmette Battlefield Unit (143 acres) by 131% (Urbatsch et al. 2009). Clearly, basic field work, getting out on foot, boats, and air boats was sorely needed in this national park (located in southeastern Louisiana within 12 miles of New Orleans). Also, without accessing voucher specimens from the park from other institutions such as Tulane University (NO), the project could not have been completed. These types of statistics, and the need for collections and collecting, hopefully will get people’s attention just as much as web site hits.

Literature Cited

- Barrow, J.D. 1995. *The Artful Universe*. Oxford University Press, New York. 274 pp.
- Blum, J. 2008. Research grants to decline. *The Baton Rouge Sunday Advocate*, Metro Section, Sunday, October 12, pp. 1B-2B.
- Brown, C.A. 1965. *Louisiana Trees and Shrubs*. LA Forestry Commission Bulletin No. 1, reprinted by Claitor’s Book Store, Baton Rouge, LA. 262 pp.
- Brown, C.A. 1972. *Wildflowers of Louisiana and Adjoining States*. Louisiana State University Press, Baton Rouge, LA. 247 pp.
- Featherman, A. 1871. Report of Botanical Survey of Southern and Central Louisiana, Made During the Year 1870. The Office of the Republican, New Orleans, LA.
- Featherman, A. 1887+. *Social History of the Races of Mankind*, 7 vols. Division I. Nigritians; Division II., Part I., The Papuo and Malayo-Melanesians, Part II., The Oceano-Melanesians; Division III., Part I., Aoneo-Maranonians, Part II., Chiapo and Guarano-
- Maranonians; Division IV., Dravids-Turanians, Turco-Tatar- Turanians, Ugrio-Turanians; Division V., Aramaeans. (The work was never completed.)
- Griffin, S. 2008. Herbarium oldest in region, houses 180,000 species [sic]. *The LSU Daily Reveille*, Friday, October 3, p. 3.
- Lowy, B. 1971. New records of mushroom stones from Guatemala. *Mycologia* 63: 983-993.
- Lowy, B. 1972. Mushroom symbolism in Maya codices. *Mycologia* 64(4): 916-821.
- MacRoberts, M.H. and B.R. MacRoberts. 2004. *Sarracenia purpurea* (Sarraceniaceae) in Louisiana. *Sida* 21(2): 1149-1152.
- Mishler, B.D. 2008. Herbarium funding and universities. *The Vasculum* 3(2): 8.
- Nelson, J. 2008. On the “Active Herbarium”. *The Vasculum* 3(2): 2-3.
- Prather, L.A., O. Alvarez-Fuentes, M.H. Mayfield, and C.J. Ferguson. 2004. The decline of plant collecting in the United States: a threat to the infrastructure of biodiversity studies. *Systematic Botany* 29(1): 15-28.
- Rafinesque, C.S. 1817. *Florula Ludoviciana*, or a flora of the State of Louisiana, revised and improved from the French of C. Robin. New York.
- Riddell, J.L. 1852. *Catalogus florae Ludovicianae*. *New Orleans Medical and Surgery Journal* 8: 734-764.
- Sayre, G. 1977. Authors and names of bryophytes and the present location of their herbaria. *The Bryologist* 80(3): 502-521.
- Schindler, J. 2005. Researchers gather plant life in Barataria [Jean Lafitte National Park]; they scout marshes to inventory flowers. *The New Orleans Times-Picayune*, West Bank bureau, Monday, August 1, pp. B-1, B-8.
- Stones, M. 1991. *Flora of Louisiana*, watercolor drawings by Margaret Stones. Louisiana State University Press, Baton Rouge, LA. 219 pp.
- Thomas, R.D. and C.M. Allen. 1993. *Atlas of the Vascular Flora of Louisiana*. Vol. I. Ferns and Fern Allies, Conifers, and Monocotyledons. Moran Colorgraphic Printing, Baton Rouge, LA. 218 pp.
- Thomas, R.D. and C.M. Allen. 1996. *Atlas of the Vascular Flora of Louisiana*. Vol. II. Dicotyledons Acanthaceae – Euphorbiaceae. Bourque Printing, Inc., Baton Rouge, LA. 213 pp.

Thomas, R.D. and C.M. Allen. 1998. Atlas of the Vascular Flora of Louisiana. Vol. III. Dicotyledons Fabaceae – Zygophyllaceae. Bourque Printing, Inc., Baton Rouge, LA. 248 pp.

Urbatsch, L.E., D.M. Ferguson, and S.M. Gunn-Zumo. 2007. Vascular Plant Inventory of Gulf Islands National Park, Florida and Mississippi. Report submitted to the U.S. National Park Service, Department of the Interior. 183 pp.

Urbatsch, L.E., D.M. Ferguson, and S.M. Gunn-Zumo. 2009. Vascular Plant Inventory of Jean Lafitte National Historical Park and Preserve, Louisiana. Report submitted to the U.S. National Park Service, Department of the Interior. 109 pp.

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The WTU Herbarium Foray Program OR How We Build Collections and Community at the Same Time

July 12, 2008. I had never seen *Chionophila tweedyi* before, even though I knew it from its phylogenetic position; its resemblance to *Penstemon* was unmistakable. Here it was on the very summit of Mt. Emerine in Montana's Sapphire Range. After collecting it and about 30 other specimens, we returned to camp on Rock Creek in time for some evening fly-fishing to rising trout before joining the rest of our party for a spaghetti dinner and the highlight of the annual foray – the Ken Davis Memorial Dessert Contest. Bringing a university herbarium into the 21st Century is a rough job, but someone's got to do it.

Although founded by the Young Naturalists Society in the late 1800's, the vascular plant collection of the Herbarium at the University of Washington (WTU) was largely the product of the prodigious efforts of C. Leo Hitchcock and his assistant Clarence Muhlick, who collected extensively throughout the western U.S. from the late 1930's to the late 1960's. In addition to his personal collecting efforts, "Hitchie" was famous for his summer field botany class, which consisted of a roving band of students who accompanied him and Clarence on plant collecting trips. I'm sure that a substantial, if unrecorded, portion of Hitchcock's productivity could be accounted for by the student collectors who got college

credit for their efforts. WTU was a busy place during those years. Between 1955 and 1969 the five volumes of the Flora of the Pacific Northwest were published, proceeding in order from 5 to 1! And, the single volume condensed version appeared in 1973, the year after Hitchcock retired. It's no wonder that when Melinda Denton took over from Hitchcock as Curator in 1972, with a newly published Flora available, building the collections was not a significant part of her plan for the Herbarium. She and her students, myself included, focused on biosystematic treatments of small groups of western plants.



Chionophila tweedyi (Scrophulariaceae)

When I returned to the University of Washington as Curator, I recognized that the Herbarium was more or less a static picture of the Northwest flora as it was in the mid-20th century. I also realized that natural history collections today need to be relevant to our contemporary societal needs AND have a support community in order to justify their existence in an academic environment, where the simple act of documenting biodiversity is no longer cutting edge academic science. Natural history collections need to continue to grow to present a dynamic picture of the biota. Only then are they going to be able to provide the sort of data that will be of value to future scientists who will increasingly look to our natural history museums to document changes in the flora and fauna resulting from climate change, habitat alterations, and the impact of invasions of non-native species. I also realized that I couldn't do it all myself.

At the time I arrived at WTU, activity in the Herbarium was restricted to a Collections Manager, Sarah Gage, and a small, but dedicated cadre of volunteers who helped with mounting and other herbarium activities. There was very little collecting going on and no systematic collecting of the Pacific Northwest flora, the region for which WTU is best represented. As I saw it, the challenges I faced as Curator were to reestablish a regional collecting program, increase the research activity, and develop a community of botanists whose involvement with the Herbarium would provide the evidence of its value to the University, the State, and the region.

In June of 1996, we inaugurated our Herbarium Foray program with a trip to the Hart Mountain National Antelope Refuge. Seventeen botanists made the 11-hour drive to spend five days camping in primitive conditions and collecting plants in the high desert of southern Oregon. The group included university faculty, staff, grad students and volunteers. It included bryologists and lichenologists as well as vascular plant enthusiasts. As a precedent that we would follow in all subsequent forays, we made advance contact with the Refuge botanist to obtain permits and local information, including any botanical survey interests of his with which we might be able to assist; and we visited with him when we arrived. We collected over 500 accessions, most in triplicate, to add to the collections and to use in a rejuvenated exchange program with other herbaria. In this case, one complete taxon set was sent to the Refuge for their small herbarium, adding many new taxa to their records (a second set went to OSC).

An integral part of that Foray, as with all subsequent ones, began months later; after the field season ended and the days shortened, we scheduled monthly work parties in the Herbarium where participants and other interested volunteers got together and worked through the determinations on all of the specimens before they were queued for mounting and databasing. Our goal each year is to have the determinations and databasing done before the next foray departs. NOTE – there is generally a two-year lag between collecting and mounting (we're currently mounting the 2006 Wenatchee Mt. Foray). The delay is due to the increased numbers coming in from various other ongoing projects.

In the 12 years that followed the Hart Mt. Foray, we have visited botanically rich and often undercollected localities throughout the Pacific Northwest (Washington, Oregon, Idaho, and Montana) and either directly or through exchange, have expanded our collections of PNW plant diversity. Of equal importance, we now have a large community of talented and dedicated botanists (>100 participants so far), who feel like they are a part of the Herbarium at the University of Washington. They participate in other herbarium projects, visit the Herbarium for research and educational purposes, donate to our endowment and Friends funds, and provide a support base that helps justify our importance to the public. We also

have developed connections with professional botanists in land management agencies throughout the PNW. This year's Foray to Lolo National Forest in Montana included 29 participants, including two local professional botanists who joined us for a portion of the foray.



WTU Herbarium Foray Group Photo



Pressing Plants!

While the annual Herbarium Foray remains the centerpiece of our Foray Program, the development of a corps of talented volunteers and the logistical expertise that has come from running these large trips, has made possible the expansion of the program into biodiversity surveys for many other purposes. Many of these are cooperative projects with various land management agencies, ranging from the City of Seattle (City watershed survey), to state, federal, and private organizations. David Giblin, who replaced Sarah Gage as Collections Manager in 2002, manages a self-sustaining program of survey projects in which the field costs and specimen processing expenses are borne by the cooperating agencies who recognize that the professional expertise we provide, in large part through volunteer participation, is more than adequate compensation.

For more information on the WTU Herbarium Foray Program, please visit our website and click "research." (www.washington.edu/burkemuseum/collections/herbarium/research.php)

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THE WIRED HERBARIUM: HERBARIUM WEBPAGES

What makes a good herbarium webpage? Certainly a clean functional design with an intuitive interface that is easy to navigate and with good connections to the information being presented is important. Faster, of course, is better. As is attention to maintaining links! Broken links, missing images, and incomplete development are all major annoyances.

But the information content can vary substantially. At a minimum, a good herbarium webpage should clearly describe the herbarium: its location, holdings, curator and staff, how to contact it, etc. More detailed information about the collection is highly desirable: an interactive search engine to explore the herbarium database is great. Beyond these, some herbarium webpages present a great deal of additional information about the distribution, ecology, or taxonomy of some species.

Probably one issue that many webpages fail to consider is how to handle work-in-progress. Too many websites merely display annoying "in progress" messages, sometimes years old, with no information about what is missing or when it will be provided. I personally have found that a major annoyance when searching incomplete databases is the uncertainty of knowing whether the collection holds the species I am interested in but doesn't have it computerized yet, or whether it lacks the species completely.

So what makes a good herbarium webpage? I think the best way to answer this is to actually explore a good webpage! Curtis Hansen of Auburn University has agreed to do this, and a review the Louisiana State University Herbarium website follows.

LSU Herbarium Website

My first impressions of The Louisiana State University Herbarium website (www.herbarium.lsu.edu/): classy, clean, well-organized, user friendly. From the main portal page you can either navigate directly to the "Specimen and Image" database (more later) or enter the main herbarium website. When you enter the website, you will find a set of selections on the left-hand menu, a sub-

set of menus in the main panel below the posted mission statement of the herbarium and a small but beautiful photo of the lighted Life Sciences Annex, which houses the 6000 square foot herbarium complex.

The "General Information" tab leads to the standard information about the herbarium: operating hours and location, including written directions, parking information and maps. Information about loan requests, exchanges and identification services can also be found on this page.

The "Staff and Facilities" tab contains contact information for each staff member, including links to personal webpages. There are four nice photos of the herbarium; two of herbarium cabinets, one of the plant drier, and one of an ultra-freezer. The history of the herbarium is a nice read, partly because of its brevity. It is about the main characters and events in the past and present that have made the LSU Herbarium what it is today. You can go to the "Friends of the Herbarium" page from this menu or link directly to it by the tab in the main left-hand menu. This page has information regarding volunteering and donating to the herbarium. They have made it very easy to join and contact staff with the online form which is available for folks to fill out and send electronically.

I found the "Links and Resources" page to be surprisingly complete without swamping you with too many links to wade through. They have wisely restricted their links to some of the best and more well-known museums, gardens, herbaria and other plant related websites - many of which are routinely used by professionals and public alike. I tested several of the links and they all seemed current and took me where I expected to go without any problems.

You can download a Microsoft Excel[®] file containing the checklist of Louisiana plants (with or without synonyms) at the "Checklists" tab on the main menu. Accepted plant names and synonyms in this list are based largely on what is accepted and excluded by *Flora of North America* and the *Atlas of the Flora of Louisiana*. A link to the explanation and a key of their scoring system is given. In addition to a bibliography of floras for the Louisiana flora, there are checklists of the plants of Calcasieu Parish and the wood decaying fungi of the Gulf South. These checklists are not downloads but are linked directly to online windows that pop up after selection. The "Literature Search" page is currently unavailable and you are invited to check back another time.

What I really liked about the LSU Herbarium website is the interactive specimen database with robust browsing and searching options. Selecting the "Specimen Database" or "Image Gallery" button takes you to the LSU Herbarium Specimen System webpage, a project supported by the National Science Foundation and the State of Louisiana. I found the ease and flexibility of navigating the specimen database very refreshing. Under the

"Browse Taxonomy" tab you can look for plants by categories (dicot, monocot, lichen, moss, lycopod, etc.), by scientific name or scientific family. Navigating through the browsing options in the left-hand panel is intuitive and simple by clicking on the expandable and collapsible folder icons. Once a category is selected, a second tree of folder icons opens listing either plant families or an alphabetical list of scientific names. Putting a check mark in the box next to your desired selection will show the query results in the results window with each line representing a unique specimen record. You can put a check mark in several boxes at one time and have all the results show up in the results window. But you must remember to uncheck a box in order to remove that group of data from the window. Searching for specific records under the "Search Collection" tab is likewise simple and is accomplished by entering your search criteria in the respective fields.

Sorting any of the results fields in ascending or descending order is done by simply clicking on the field heading at the top of each column in the results window. For example, you can sort by barcode (LSU), family, genus, species, state, county, collector, etc. You can perform complex sorts that organize two or more columns of data sequentially. For example, if you click on the State column and drag across to highlight the County column also, the program will sort data alphabetically by state then by county, a nice feature if you're quickly trying to locate certain county information within particular states. If you double click on an individual record a window pops up giving the options of viewing individual label details, a photograph of the specimen, a map of the collection location, and comments, if any. Not all specimens have a photo, map or comments associated with them. There are small icons next to each record in the results window to indicate if the record has a photograph or map associated with it. Occasionally, the detailed specimen data would not load for me and I had to close the window and retry. I like the dynamic specimen photographs and maps. You have the ability to zoom in and out on the image to look closer at morphological characters on the herbarium sheet. Likewise, the dynamic Google Map[®] associated with the collection location has the ability to zoom in and out and view satellite or hybrid maps of the location. There are options that allow the data results to be down loaded as a MS Excel[®] file or e-mailed, although the e-mail option seemed to be off line currently. Individual specimen data can also be printed directly from the pop up window.

Searching in the "Images" database opens an alphabetical tree on the left-hand side from which you can choose a family, genus then species. These photos are not of herbarium sheets but of the plants in the field. Many are high quality and are able to be viewed at higher resolution by double-clicking on the thumbnail image. Most of the images loaded for me, however there were several with broken links or that would not load.

The "Gazeteers/Checklists" feature is a neat tool to quickly give you a county or state checklist of plants held by the LSU Herbarium. This option is no doubt most helpful when creating parish checklists for Louisiana but it can also give useful distributional information about LSU's holdings from other states as well. The "Download Data" and "Email Data" buttons were not active.

Finally, the "Fact Sheets" tab provides an alphabetical listing of plant species linked to a detailed page of information. Detailed descriptions of the plant along with geographic distributions, maps, other resources, references and nomenclature are all listed. Additionally, I was impressed with the number of detailed photos provided showing close-ups of flowers, stems, hairs, seeds, etc.—usually 16-23 photographs for each fact sheet. Currently there are only about 80 specimens with fact sheets, but the information potential is huge as new plant fact sheets are added to the list.

One thing that I didn't see that would be a nice addition is a "reset" or "universal clear" option to clear all check marks from selected boxes in the folder tree. Once a box is checked it must be unchecked individually in order to remove the data from the results window. Simply collapsing the folder tree does not remove the check mark and it was a bit tedious going back to uncheck boxes after a complex search.

That being said, I would strongly encourage everyone to spend some time exploring this website, especially the dynamic specimen database. You'll find that with a few clicks you can access a wealth of plant information. With only a few minor hitches here and there, I found that the LSU Herbarium website lived up to my first impressions of being well-organized, easy to use and classy - a great place to spend some time browsing around.

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NAME THAT PLANT!

The quiz genera in our last issue were: 1) *Parkinsonia*, 2) *Cinchona*, 3) *Delonix*, 4) *Passiflora*, and 5) *Erythrina*. Congrats to Amy Boyd, Michael Denslow, Katharine Gregg, Joseph Kirkbride, Sula Vanderplank, and Andrea Weeks for having the top responses!

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