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Lilium michauxii Poir. Carolina lily. From the inaugural exhibition featuring the work of pioneer ecologist B. W. Wells.

GENETICS AND PLANT GENOMICS:



BUILDING UNIQUE COLLECTIONS for the Twenty-first Century

BY BOB SOTAK, COLLECTION MANAGEMENT, AND
GREG RASCHKE, COLLECTIONS AND SCHOLARLY COMMUNICATION

Genetics, the study of heredity, is considered to have begun with the plant hybridization experiments of Gregor Mendel in the middle of the nineteenth century. In the twentieth century, North Carolina State University established an excellent reputation for its own research in plant and forest genetics. The range of this research illustrates why the Libraries' collections must constantly evolve to meet the needs of faculty.

S. G. Stephens, the first chair of the genetics faculty, was an international authority on the genetics of cotton. Geneticist **John Scandalios** is well known for his work in developmental and biochemical genetics. **Charles S. Levings III** of the Department of Genetics became a member of



S. G. Stephens. Courtesy Special Collections Research Center.

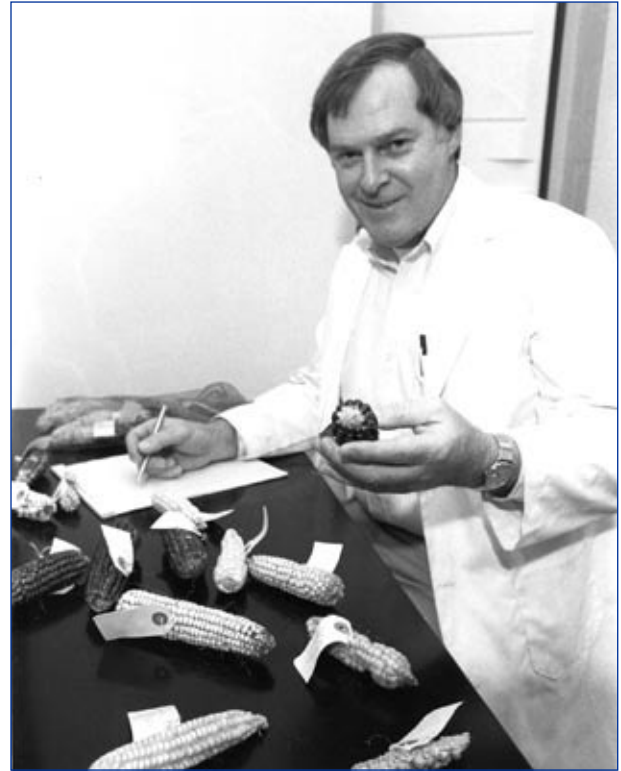
the National Academy of Sciences and made significant advances in the understanding of plant mitochondrial genetics, especially traits such as cytoplasmic male sterility in maize. **Charles Stuber**, also with the genetics department, studied quantitative inheritance in plants and pioneered the use of molecular markers to improve traits such as grain yield.

Plant genetics research at NCSU is not limited to the genetics department, but is also an area of research in the departments of forestry, crop science, horticulture, botany, and plant pathology. **Bruce Zobel** of forestry specialized in forest genetics and tree improvement and started the Industrial Forest Tree Improvement Cooperative. **Major Goodman** of crop science, a member of the National Academy of Sciences, achieved recognition for his work in using maize germplasm resources in breeding. Professor of Crop Science **Dan Gerstel** specialized in the cytogenetics of tobacco and cotton.

As a land-grant institution, genetics research at NC State has a strong applied aspect. Many of the findings made in plant and forest genetics and genomics research are ultimately used in plant and agricultural biotechnology and other areas.

Genomics is different from genetics in that it studies the entire genome or genetic complement of an organism. It has a more recent origin than genetics and came to the public's attention with the sequencing of the human genome, which was completed in 2003. North Carolina State University researchers have already made significant contributions in plant genomics. Ron Sederoff, a member of the Department of Forestry and of the National Academy of Sciences, is well known for the application of genomics to forest-tree species such as loblolly pine. **Ralph Dean** of plant pathology collaborated on sequencing the rice genome and is the leader of the Rice Blast Genome Initiative, which is mapping and sequencing the rice blast pathogen *Magnaporthe grisea*. **Steven Lommel** and **Charles Opperman**, both with the plant pathology department, received a \$17.6 million grant from Philip Morris USA to map and determine the nucleotide sequence of the tobacco genome. Their Tobacco Genome Initiative should provide valuable data that can be applied to other plant species.

The importance of genomics at NCSU is reflected in the graduate programs in functional genomics and bioinformatics that have more



NC State Professor Major Goodman. Courtesy Special Collections Research Center.



[Left to right] NC State faculty Steven Lommel and Charles Opperman, Department of Plant Pathology, 2003. Photo courtesy NCSU Communication Services.

than 100 professors listed as genomic sciences faculty. In addition to the College of Agriculture and Life Sciences and the College of Natural Resources, genomic sciences have representatives from the colleges of Engineering, Veterinary Medicine, and Physical and Mathematical Sciences. The establishment of the Genome Research Laboratory on Centennial Campus has further enhanced researchers' abilities to do high-throughput genomics research.

With such breadth and quality of research at NC State in the areas of genetics and plant and forestry genomics, the Special Collections Research Center has initiated efforts to build its genetics and genomics holdings to enhance the already excellent body of materials in the general collection. Prominent NC State faculty such as Zobel, Sederoff, Goodman, Gerstel, and Stuber have either donated or promised to donate their papers and research documentation to the center.

In 2005 the Libraries added **Mary Dell Chilton's** papers, documenting her Nobel Prize-nominated graduate and post-graduate research that led to the discovery of the technique by which all genetic manipulation of plant species is done. In a recent article appearing in the *International Journal of Developmental Biology*, Chilton's

research was ranked eighth in a chronological list of the most important milestones in the history of plant developmental biology. To complement the growth of papers from prominent scholars, the Libraries continually adds to its Special Collections holdings rare and seminal books documenting the establishment and growth of genetics and plant genomics as research disciplines.

The path from Mendel to sequencing genomes and creating the science of the twenty-first century has taken contributions from many scholars, including a number of prominent researchers at NC State working in a variety of disciplines. The NCSU Libraries is dedicated to documenting NC State's contributions to plant and forestry genomics while capturing seminal contributions in the history of genetics scholarship. The Libraries welcomes support for this important collecting initiative and encourages other donors to expand the research center's collections. Those who would like to support the processing, growth, and possible digitization of these resources should call either Jim Mulvey, director of library development, at (919) 515-3339, or Greg Raschke, associate director for collections and scholarly communication, at (919) 515-7188. ❖

Mary Dell Chilton in her lab at Syngenta, Research Triangle Park, 2006.



“Elluminate” Library Research for Distance Education Students

BY KIM DUCKETT, RESEARCH AND INFORMATION SERVICES



[Left to right] Librarians Kim Duckett and Scott Warren during an Elluminate Live!® session with distance education students.

Several times each semester, NCSU librarians meet virtually with groups of distance education students online using a synchronous, virtual classroom called Elluminate Live!® This tool, now being pilot-tested at the university, provides an online environment in which students meet with librarians, watch them demonstrate how to use library resources, ask questions, and interact with classmates. These workshops are similar to the face-to-face sessions offered by librarians on campus and are part of the Libraries' efforts to provide the highest-quality services for distance learners. For many of these students, this online instruction will be their introduction into library research even though they may never set foot on campus.

Since 2003 Kim Duckett, principal librarian for digital technologies and learning, has

experimented with a variety of technologies to organize online, synchronous instruction. Elluminate Live!® is by far the best technology the Libraries has used. It allows students to gather in an online classroom where each person has a unique presence and can use icons to raise their hands, express emotions, and answer quick polls. The librarian talks to the students via voice-over IP and can share a Web browser with students to demonstrate how to search for books and articles. Students with microphones can talk with the librarian over the Web, but text chat is also built into the Elluminate Live!® environment and is a more common mode of communication for students. Additionally, Elluminate Live!®'s archiving capabilities allow the librarian to record the session to share with students who could not attend.

Workshops are typically offered in the evening to accommodate the work schedules that lead many students toward distance education. Duckett works closely with instructors to assess learning objectives for the sessions and to establish methods of communication with students. Most workshops have focused on searching article databases, the library catalog, and Refworks, an online citation management program. Duckett also collaborates with library subject specialists to design and deliver specialized instruction. Each semester she works with **Scott Warren**, a subject specialist in textiles and engineering, to teach groups of undergraduates about the economics of information and issues pertaining to scholarly communication. She

also collaborates with **Katherine Dexter Willis**, the reference librarian for education and management, to teach students about library resources as part of an education research methods course. **Eleanor Smith**, reference librarian for the life sciences, collaborated with Duckett to design an “Introduction to Literature Reviews” workshop for graduate students.

Feedback from students is overwhelmingly positive. The workshops are routinely rated as “informative” and “very useful.” One student noted that the archived workshop she watched “provided concrete actions to help my [research] efforts.” **Andre Blair**, a graduate student in the Department of Adult and Higher Education, commented, “The experience was great! Unexpected staffing problems

at work required an extended day (13 hours), but with your technology and a broadband connection, I was still able to participate. I look forward to other Web-based training opportunities at NCSU.”

Instructors have also praised the Libraries’ efforts. **Daun Daemon**, Department of English, said, “My three classroom sections get the benefit of interacting with librarians in person, which allows them to ask questions they have during the presentation. Elluminate allows my online students to have as rich and rewarding an experience.” **Julia Storberg-Walker**, assistant professor in adult and higher education, explained,

The online workshops have been an invaluable addition to the graduate level master’s degree courses I teach for

The screenshot shows a software interface for an online session titled "Elluminate Live!". On the left, there is a "Participants" list with names like "kiducket (Moderator)", "scott (Moderator)", "Amanda", "Ann", "Brian", "Charles Leyrer", "Jason", "Karyn", "kate", "Katherine", "Katie Rose", "Kevin (Away)", and "nashepa". Below this is a "Direct Messaging" window and an "Audio" control panel with "Microphone" and "Speaker" indicators. The main area is a "Whiteboard - Main Room (Scaled 148%)". The whiteboard content includes a red box at the top labeled "Web Search Engines", a blue box below it labeled "World Wide Web - Millions of web pages!", and another blue box below that labeled "Web pages containing search tools (DATABASES)". Arrows point from these boxes to a collection of blue cylindrical icons representing databases. Some of these icons are labeled with a dollar sign (\$) and others with "free!". Below the database icons is a large blue box labeled "Silos of Information". At the bottom of the whiteboard, it says "In session for 1 hour, 13 minutes".

Elluminate Live.® session.

two reasons: First, attending the workshops helps students de-mystify the library search engines and helps them develop a feeling of partnership with the library. Although it is virtual, the students put a “face” on the library and the barriers of using library services are decreased. Secondly, knowing that the workshops are available and effective gives faculty the assurance that their students are learning how to incorporate the library into their scholarship.

Instructors or others who are interested in learning more about the Libraries’ online workshops for distance learners should call Kim Duckett at (919) 513-3653, or send an electronic-mail message to kim_duckett@ncsu.edu. ❖

Susan Osborne Receives 2006 NCSU Libraries Faculty Award

By BOB SOTAK, COLLECTION MANAGEMENT

Susan Osborne, associate professor of special education with an emphasis on mental retardation and learning disabilities and coordinator of the graduate program in special education for curriculum and instruction, received the eighteenth annual NCSU Libraries Faculty Award. This award is presented annually to an NC State University faculty member in recognition of outstanding contributions that support the Libraries’ mission and its role within the university. The award was presented to Osborne at the Friends of the Library’s Fall Luncheon on October 16, 2006.

Osborne’s contributions to the Libraries are many, most notably in the area of scholarly communication. She was influential in establishing the Scholarly Communication Center and in hiring its scholarly communications librarian. She served on NC State’s University Library Committee (ULC) for many years and was a member of its scholarly communication subcommittee, serving as subcommittee chair from 2001 through 2005. As chair she helped to publicize to faculty important initiatives such as the Public Library of Science and the Tempe Principles and became deeply involved in the Research Library of the Future panel discussions. She also served as the subcommittee’s liaison to the ULC.



Osborne played an important role when the subcommittee sponsored the Copyright Ownership Task Force, the Copyright Ownership Town Meetings, and other colloquia. She accompanied librarians to town meetings and provided a faculty member’s support and viewpoint on important scholarly communication issues. In 2001 she led a presentation of the “Principles for Emerging Systems of Scholarly Publishing” given to the NC State faculty at a General Faculty Meeting. This presentation among others helped to make faculty members much more aware of the significance of scholarly communications issues, such as copyright and fair use, especially as it applies to their academic research and teaching. In addition, she has raised scholarly communication issues with the publisher of her society’s academic journal. Discussing these issues with publishers provided valuable support to librarians in their interactions with publishers.

Not only is Osborne a vocal and ardent supporter of the Libraries’ mission in promoting scholarly communication initiatives, but she and her husband, Stephen Reynolds of NC State’s physics department, are supporters of the Friends of the Library and regularly attend its events. One Faculty Award nominator praised Osborne as an ideal supporter of the Libraries. Another cited her efforts to advance the Libraries’ goals. All in all, Susan Osborne has tirelessly supported the Libraries and promoted its role as an essential component of the university’s mission. ❖

Students Work Hard for Us

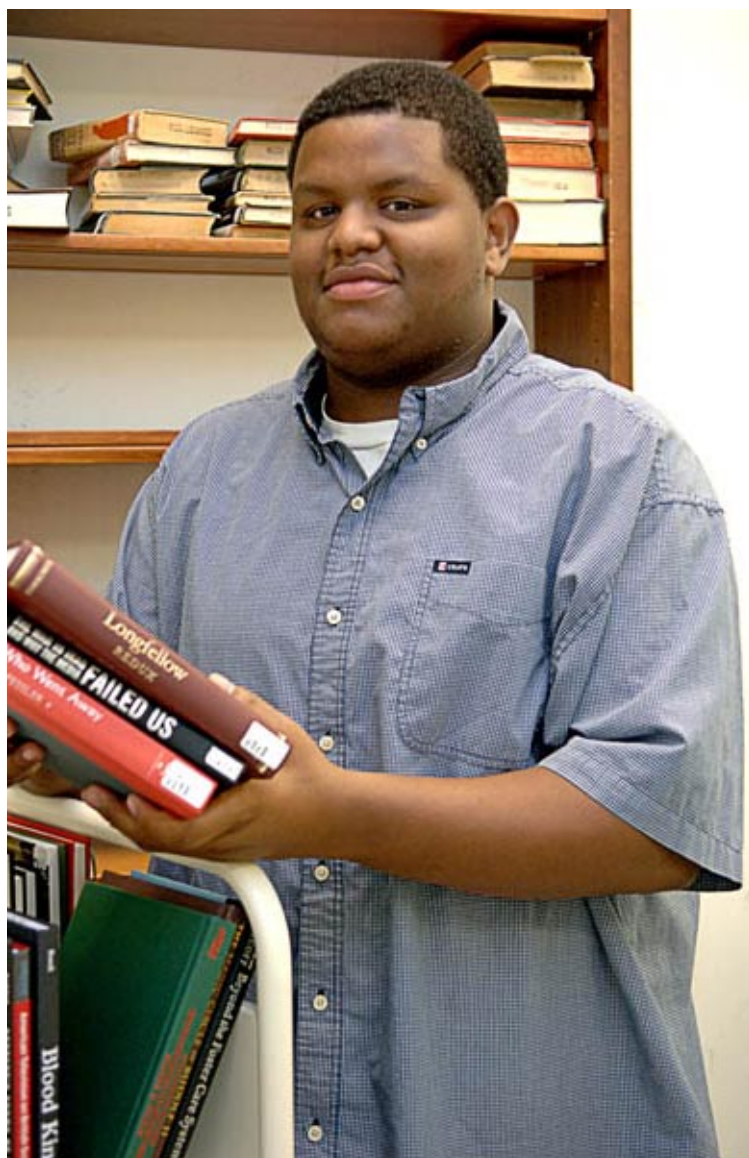
By KATHY BROWN, PLANNING AND RESEARCH, AND CHELCY BOYER, EXTERNAL

They come from a variety of backgrounds to perform a variety of responsibilities for the NCSU Libraries. Collectively, the hours they work represent the equivalent of fifty-six full-time personnel. Who are they? They are the Libraries' student workers. For them, the flexibility the library offers in arranging work schedules around classes ranks high, as does the convenience of an on-campus location. Flexibility and convenience, however, are only part of the equation. Just a few of their stories illustrate how essential these students are to the functioning of the library.

systems support
circulation shelving
metadata entry
preservation
digitizing
cataloging
reference
helping users
scanning
acquisitions
sorting
catalog searches

The largest concentration of student employees is in the Access and Delivery Services Department. **Jeff Curry** is one of the most experienced members of the stacks team. Hailing from Roxobel in the northeastern part of the state, Curry started working for the library in August 2001. He is now the point person for training new student workers in shelving, shelf-reading, straightening, sorting, shifting, searching, and sending notices. "We handle a lot of 's' activities," he notes. Accuracy is important, and trainees undergo two tests before they are permitted to shelve independently. Team members wear special vests in the stacks; this makes them visible and places them on the front line in helping people. The quantity of materials handled reflects the unrelenting pressure on the team. So far this year they have shelved 235,000 items, putting them on track to exceed last year's shelving total of 250,000 items.

Curry has stayed with the library because he enjoys the people and the contents of the collection. This semester he worked about thirty hours a week. Next semester may find him working fewer hours as he completes his course work. Curry is majoring in communication with a media concentration and hopes to be involved in production, perhaps establishing his own company at some point in the future. "Being a student, I know how hard it is to find things," he declares. "It's really important for us to get things to the right spot in a timely manner."





Chris Hill also appreciates the library's flexibility as he juggles a demanding schedule that includes four courses and a thirty to forty hour workweek in the library. He is majoring in wildlife sciences and is on track to graduate in December 2007. His background indicates adaptability. As a member of a military family, he moved frequently, although he identifies Radford, Virginia, as an area where he has ties. He met his future library supervisors when he worked in a coffee shop. They described openings in their departments, and he ended up working for both.

In the Special Collections Research Center, Hill is part of "Green 'N' Growing," a grant-funded project documenting the history of 4-H and Home Demonstration in North Carolina from the 1900s to the 1970s. When completed, users will be able to access digital reproductions of more than 10,000 items. Hill plays a key role by digitizing photographs and texts, performing quality checks, and entering metadata about the content. He also works in the Digital Media Lab, where he scans and edits a variety of media. Equally important, he puts people at ease with a range of technologies by answering questions and demonstrating how to use the laboratory's equipment and software. Hill gleaned some of his technical skills by experimenting at home with his father, and he picked up the rest through his work in the library. Having always been a PC user, he was pleasantly surprised to discover the capabilities and user-friendly interfaces of the Macintosh. "I now prefer the Mac," he states.

After graduation, Hill will explore positions with a government agency. He is also contemplating graduate study, because his career goal is to work for the U.S. Fish and Wildlife Services in the Endangered Species Program. Photographs of endangered animals can increase empathy for endangered species, and he expects that the knowledge he has gained as a media technician will prove useful at that phase of his career.

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Josh Brown tackles a different type of technical work in the library's Preservation Department. A business management major anticipating a May 2007 graduation, the Roxboro native landed in Preservation somewhat by chance. Brown participates in the work study program offered at NC State, which places students across campus. Preservation's position description piqued his curiosity, and he has worked roughly ten hours per week in the department for the last year and a half.

Since joining Preservation, Brown's assignments have increased in complexity as he has learned new skills. He started by repairing tears in pages. Later, he made customized phase boxes to house materials either too brittle or too costly to repair in light of their anticipated use. He has now advanced to deconstructing and reconstructing badly worn books: cleaning the spine, resewing the spine and adding reinforcement tape, insert-

ing new end pages, and making a new cover. The work is painstaking and requires several hours to complete. He describes the effort as being worthwhile, because the conservation treatment will provide the book with another thirty to fifty years of use before it finds its way back to the Preservation Department. "I've learned a lot about things I had never thought about, and I'm still learning," he muses. Before his exposure to the Preservation Department, he admits he might have used scotch tape to stabilize a torn page. "Please don't do that," he says, "it can be a real mess to clean up."

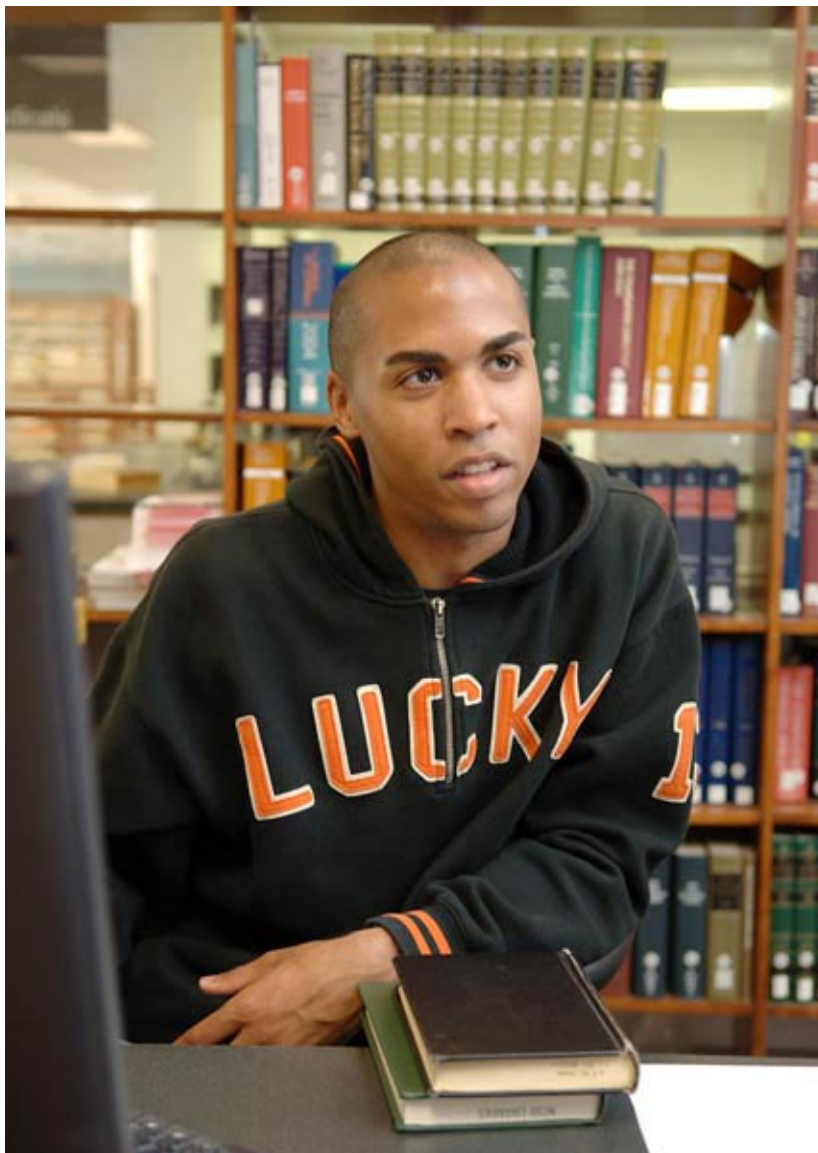
In Research and Information Services, **Robert Waldrup** is midway through his first semester as a member of the Peer Research Advisors Program—a library initiative designed to make the reference process less intimidating for students and to enhance the information literacy skills of the advisors. Waldrup came to NC State "by way

of the world” and Goldsboro. He selected meteorology as his major after witnessing the impact of Hurricane Fran. He is the recipient of an Air Force scholarship and will likely become a weather officer after graduating in December 2007.

Waldrup discovered the Peer Research Advisors Program through a former advisor who encouraged him to apply for the slot she had held before graduating. His mission is to help students find the information they need, whether it be identifying a relevant database or finding a book in the stacks. In some cases the training has been fairly specialized. He received an overview of chemistry reference

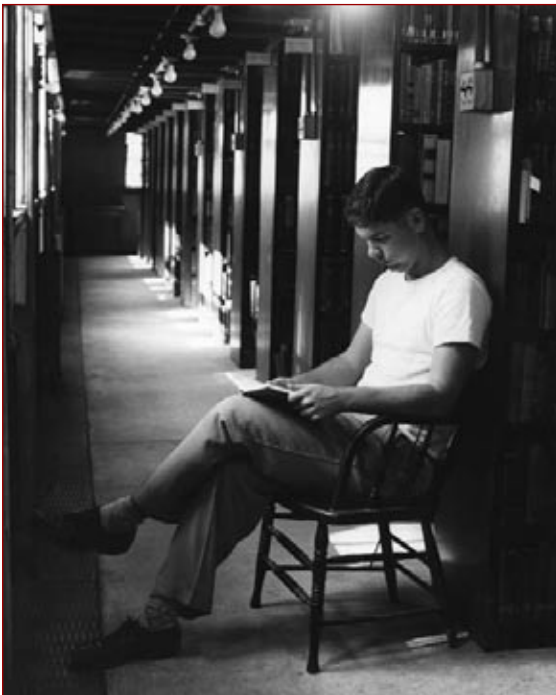
materials, for instance, to help students with a class assignment. Through his experience at the reference desk, Waldrup feels he has gained “a different mind set for detective work.” Knowledge of information resources is important, but the greater challenge lies in “learning what people really want by asking probing questions.”

Commitment, intelligence, engaging personalities, technical skills, people skills—it is hard not to be impressed by the library’s student workers. Brian Clossey interacts with numerous student workers as a supervisor in Access and Delivery Services. “If you say anything,” he urges, “stress how hard they work for us.” ❖



Breaking the Rules: Alumni Remember the Library

BY ANNA DAHLSTEIN, FRIENDS OF THE LIBRARY AND EXTERNAL RELATIONS



After retiring as director of the D. H. Hill Library in 1987, I. T. Littleton wrote *An Informal History*, tracing the history of libraries at NC State, from the modest reading room on the third floor of Main Building (now Holladay Hall) in the late 1800s to the emergence of a nationally ranked research library. In the University Archives of the Special Collections Research Center, there are many cubic feet of primary records documenting the institutional growth and evolution of the NCSU Libraries.

However, to gain another, more personal dimension to this history, the Libraries is asking alumni, former librarians, and others to contribute their recollections from this hub of the campus. From the stories that have been submitted so far, it is evident that students not only appreciated the Libraries' resources or quiet study environment, but also found the time to flirt in the bookstacks and gaze at the view out the window. Here is a sampling of anecdotes and reflections; to read more or contribute a story of your own, please visit the "Library Memories" Web site at www.lib.ncsu.edu/memories/. The Web site includes links to library photographs included among the digitized selections from the University Archives Photograph Collection.

Student Antics

I recall one cold Sunday evening the night before fall exams began; I arrived to a packed library. It took me quite a while to find a space to study. After I sat down to study, it didn't take me long to discover why that space was available—there was a noisy copy machine just a few feet away. To no avail, I tried blocking out the noise. Then, I got an idea to solve this problem. When no one was looking I took out a piece of paper and in large letters wrote, "Out of Order" and then placed it on the copier. This solved the noise issue, although I did feel very guilty as other students approached the copier one at a time only to be disappointed.

—Sheila Jarrett Beal, Class of 1989

Living in a frat house made the library a perfect place for peace and quiet, and of course studying. One Sunday evening my girlfriend and I were on one of the upper floors, her doing research and me studying for an exam. It was close to closing time, so we decided to head down. She never liked elevators, so after the doors closed and we started descending, I started jumping up and down, making the elevator shake and rock. She panicked and started yelling stop, when suddenly the elevator did exactly that—between floors.

—Bradly Armand Merlie, Class of 1981

Gaining Privileges to the Stacks

Most undergraduate students did not have access to the stacks. Graduate students did, but from what I can recall, undergraduates had to maintain a certain grade point average and apply for a special access pass. I was a good student, so after my first semester, I was able to gain access to the stacks. Everyone else had to write out requests for certain titles, turn them in, and wait for a library staff member to bring them out. There was, of course, no online catalog—you looked up resources in the card catalog.

—Jane Warren, Class of 1968



A new world was opened to me when I was invited to join the Engineering Honors Program in my Junior year. One of the real perks of that program was a “stack pass” that allowed Honors students the same access to the library stacks as graduate students. This meant that we could finally do serious research or just serious browsing through that treasure trove of books and periodicals anytime we wished, and I thoroughly enjoyed this privilege. . . . I remember being in the D. H. Hill stacks once when there was a power failure. It was no big problem because I could still sit by the window and read amidst that huge storehouse of print. Today when the lights go out knowledge dies with it!

—James F. Marchman III, Class of 1964; Ph.D 1969

I remember . . . talking to my Dad once about the view from the top floors, how it was amazing to me that you could see out over all the trees that I so often drove under. And there are oak trees in Raleigh, of course, and I thought it reminded me of the world I had read about in *The Hobbit* by JRR Tolkien. There was one summer when I was on campus taking a class or two and that was the summer that research first became interesting to me. And I mean suddenly every subject under the sun was incredibly fascinating (tree rings, architecture, photography, literature, on and on). At some point I began to spend more time in the library with a new desire to just know more, about almost anything.”

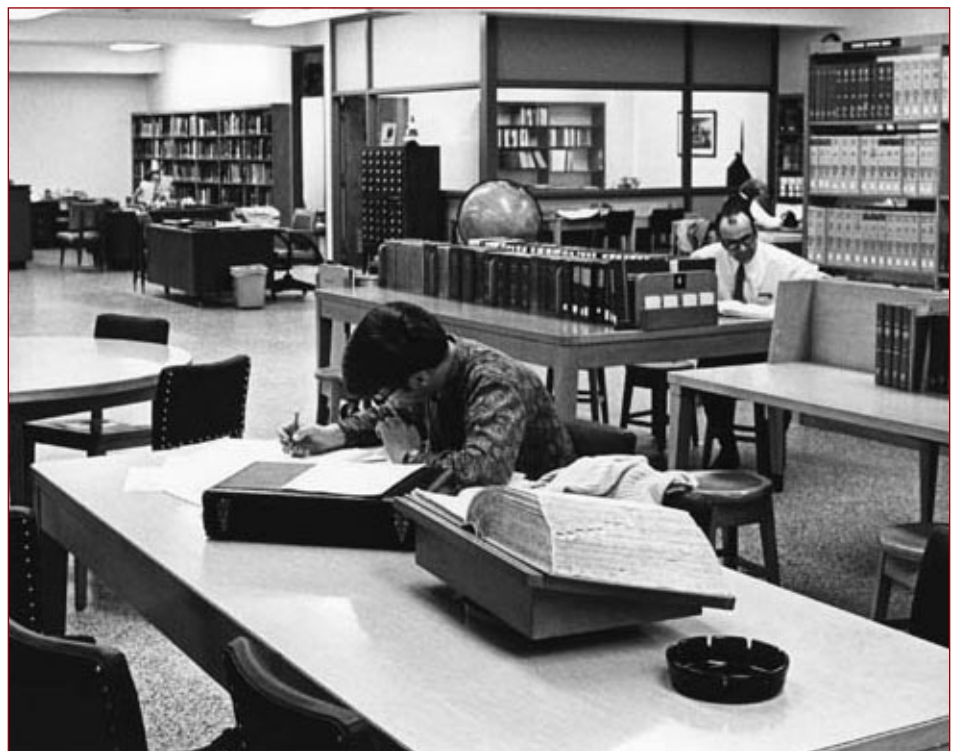
—William Harrison Griffin Jr., Class of 2000

Daydreaming and Learning

I worked in the library in '98. I worked a grand total of about 6 hours a week. I would get my cart of books to shelve, then head up to the ninth floor. I would leave the cart sitting there and just go to the window and look out at the view. Slack, yes, but what is to be expected from a freshman? I love that view. I think about it sometimes and get sad because I don't attend school there anymore. . . .

When I was tired between classes I would go to the first floor, find an empty chair and just get blissful sleep!

—Erik Kennelly, Class of 2001





Focus, a newsletter published three times a year, seeks to promote the services, activities, needs, and interests of the NCSU Libraries to the university, the Friends of the Library, and beyond.

Editor: Terrell Armistead Crow.

NCSU Libraries Homepage: <http://www.lib.ncsu.edu/>