When B. F. Bush performed the simple task of picking an orchid from the hills near Sapulpa in Indian Territory in 1894, he had no idea that a century later, his specimen would serve as a window-in-time for researchers at the University of Oklahoma's Bebb Herbarium.

Orchids and Indian Territory might seem like an unnatural pairing to most people, while the word "herbarium" and green, living plants probably seem like a perfect match.

"The first thing people imagine is a greenhouse with herbs," says James Estes, herbarium curator and OU professor of botany.

But people are mistaken.

"The herbarium is a cross between a museum and a library," Estes explains. Bush's orchid, along with 200,000 other specimens of Oklahoma plant life, are tucked away on the second floor of the Botany-Microbiology Building. Their existence both chronicles the state's history and points to the future.

"The herbarium records a part of our heritage and allows us to understand Oklahoma's past and the natural elements that make up the state. It's as much a part of our history as the written records of the state."

The Bebb Herbarium has a history of its own at OU. The University's first herbarium was established in 1893 by Edwin C. DeBarr, one of the first four professors hired by President David Ross Boyd. An Old Science Hall fire in 1903 wiped out the collections, but they were rebuilt by Alfred H. Van Vleet, OU's first graduate dean. In the early 1940s, the late Robert Bebb of Muskogee willed 30,000 plant specimens to the University, which in turn honored Bebb's generosity by selecting his name for its herbarium. The combined collections were tended lovingly for many years by Curator Emeritus George Goodman and his students and colleagues. In 1981, Estes became the herbarium's curator.

Estes appreciates and understands the care and concern shown by the herbarium's former guardians.

"There's a feeling of stewardship that comes with managing the collection, a real sense of responsibility," says Estes, who has received both the Kenneth E. Crook Award for outstanding teaching in the College of Liberal Studies and the Baldwin Travel Study Award for teaching excellence.

Gil Jain

Curator James Estes, at left with his predecessor, George Goodman, defines the Bebb Herbarium as "a cross between a museum and a library." The OU collections—more than 200,000 specimens of Oklahoma plant life, including 30,000 willed to OU by Robert Bebb—date back to an 1894 Indian Territory orchid.

"The first thing people imagine is a greenhouse with herbs."

Part of that responsibility extends to the 6,000 new specimens added each year to the collection by OU field researchers and private citizens. In a procedure that has not varied much since the 18th century, the locality and habitat of the plant specimens are documented down to the most minute detail, the plants are dried between cardboard and newsprint paper, then fastened on paper with water-soluble glue and placed in folders. The folders are stored according to family; all the plant relatives are reunited in 180 metal lockers—some dating from the 1880s—lined up side-by-side in a 30-by-30-foot room.

This is not to say that the herbarium collections are simply gathering dust. The collections are in constant use by people from across the world. Locally, farmers and gardeners use the specimens for comparison, to find out what they have growing (usually as weeds) in their own backyards. Herbarium staff members often are asked by the National Poison Control Center to identify plants eaten by animals or children. Scientists from far-flung nations write to Estes and ask to borrow specimens for their research.

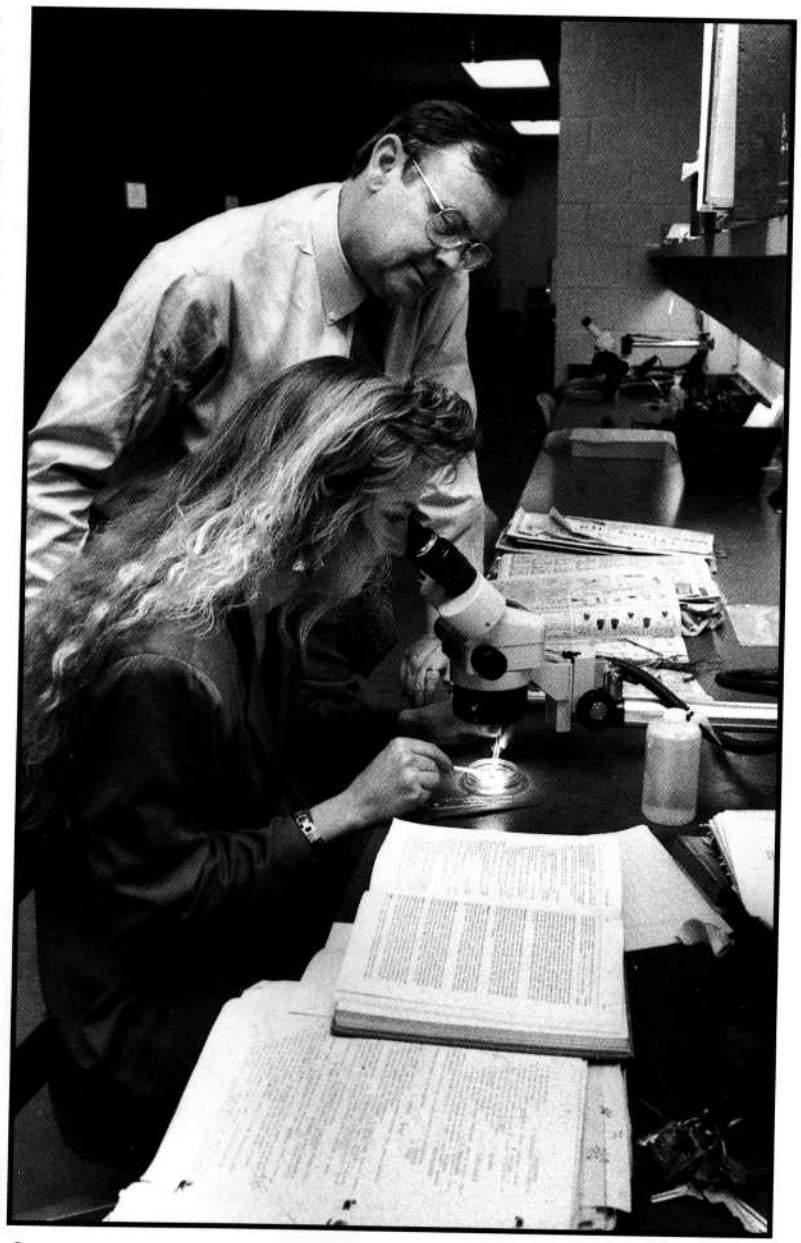
And some of the most important research conducted with herbarium specimens is going on in OU's own botany laboratories.

Estes, who recently returned to the

University after a two-year stint in the National Science Foundation's Division of Environmental Biology, says that although methods for plant collection have not changed greatly over the centuries, technologies used to analyze plant specimens certainly have. Indeed, OU is involved in the training of many of the nation's plant systematists—scientists who use advanced technology to study plant evolutionary patterns and how plant groups are related to each other.

For example, Estes, Linda Watson, a researcher with OU's Oklahoma Natural Heritage Inventory, and Amy Korhkven, a doctoral student, are studying the DNA of members of the sunflower family to understand the origin and evolution of some of our most common plants—sagebrush and chrysanthemums. John J. Skvarla, another curator at the herbarium, is using electron microscopy to study pollen, in the hope of understanding evolutionary patterns among a wide range of plant species.

"This research is at the forefront of genetic history systematics," Estes says.



Gil Jain

Curator James Estes supervises the work of herbarium assistant Patty Cruze, a graduate student, as she gets a start on the boxes of plant specimens waiting to be examined and identified by herbarium scientists.

Herbarium staff members also are working with other scientists to search for new anti-cancer drugs.

And there is much more research to be done. Boxes of plant specimens await their turn for examination and identification by herbarium scientists. So far, research conducted at the herbarium has produced 250 plant specimens that previously had not been named. Among these is the recent collection of an extremely common grass species in Oklahoma.

"Your senses are overwhelmed by the lack of knowledge we have about plants," Estes admits.

Estes and his herbarium colleagues are trying to advance that knowledge through a new database that would allow all of the collections to be entered into a computer. If funding is made available, the project could be completed within three years.

But in that same period of time, Estes predicts that the herbarium could run out of space for future collections. Recent federal and state grants have added more work and more workers to the herbarium.

"It will be no more than a couple more years before we have to do something to alleviate the situation," he says. "But don't get me wrong—it's a nice problem to have."

Estes is exploring the possibility of buying a new storage system consisting of shelving on rollers and tracks that would give the herbarium 15-to-20 years of growing space.

Other signs of growth may include the development of a display area with samples, photos and descriptions of plants for use by the public. The display would provide people with easy access to the herbarium collections, while also protecting precious specimens—such as the nearly 100-year-old orchid—from too much handling.

"Our older collections are as valuable as a plant collected yesterday, and in most ways, more valuable," he contends. The collections' value lies in their use to future scientists. When used with the Geographic Information Systems, technology that combines maps and data, the specimens can help compare and comprehend the changes that Oklahoma has undergone since B. F. Bush unknowingly launched a herbarium in the hills of Indian Territory.

"And of course," Estes smiles, "everything is still changing."

—ANNE M. BARAJAS