

LAB SPOTLIGHT

Dartmouth's Botanical Archives: The Jesup Herbarium

BY ROBERT HALLOWELL '03

In the basement of Gilman, down a small hallway where few students venture, one of Dartmouth's most interesting and historical treasures is stirring back to life. At first glance it may not seem like much: rows of large steel cabinets with worn brass knobs line a drab, windowless room. But looks can be deceiving, for within these cabinets lies an invaluable historical and biological resource that is currently undergoing a major transition. It's called the Jesup Herbarium, and it contains about 100,000 pressed and dried plant specimens, each taxonomically organized. Such historical figures as Henry David Thoreau and Miss Mary Hitchcock have contributed to the collection, and some of the specimens date back to the 1820s.

As she sorts and packs the herbarium for its future move from the basement to the fourth floor of Gilman, Lisa Palmer, Dartmouth's greenhouse manager and curator, states: "Walking down the rows of boxed specimens exposes one not only to the incredible diversity in the plant kingdom, but also to a brief overview of world geography and a bit of world history." Such history can be found in the numerous specimens collected from worldwide locations that have changed names over time. Perhaps most notable is the group of plants labeled as hailing from the "Sandwich Islands," now known as Hawaii.

According to David Peart, professor of biology, the herbarium is a "museum for the biodiversity of plants which provides a means of identifying species." Herbariums are thus the standards of reference, and therefore serve as great teaching tools, being more definitive than slides or field guides. They are used for research in systematics and biogeography, oftentimes documenting the changes in fauna over time in correlation to a change in the landscape. For example, in 1895 a scientist collected and marked as rare a specimen of Bishop's Weed.

Bishop's Weed is now a ubiquitous invasive species, and biologists can hypothesize that it arrived in the region somewhere around the turn of twentieth century. In addition to illuminating the past, herbarium specimens allow biologists to utilize morphology and DNA extracted from the plant tissues in order to study natural variation within a species.

The Jesup Herbarium was named for Henry Griswold Jesup, a distinguished scientist who joined the Dartmouth faculty in 1876 as the first appointed professor of botany. By awarding annual prizes to the two students who brought in the top two collections, Jesup was instrumental in expanding the already existing collection that resided in the fourth floor museum of Culver Hall, a building that was once located across from what is currently Topliff. The collection was later moved to the Butterfield Museum, where it was stored in wooden cases that left the specimens susceptible to dust, moisture, and insect damage. The Butterfield Museum was eventually demolished to make room for Baker Library, and the herbarium was relocated to the newly built Silsby Hall, where it was stored in more appropriate steel herbarium cases.

It is Arthur H. Chivers, class of 1902, who is given credit for restoring Dartmouth's herbarium. Chivers rescued the aging and damaged specimens, and he combined the college's collection with Jesup's private collection, thus giving it its present name. In 1923, after the death of botany professor George Richard Lyman, several of Lyman's friends and students purchased his private collection of nonvascular plants and added it the college collection as the Lyman Herbarium. Chivers served as curator of Dartmouth's herbaria until 1950, when he was succeeded by James Poole (Poole 1960). As Poole aged, his assistant Bob Downs gradually took over the running of the herbarium until

Poole's death in 1984, and he has remained curator of the entire collection up to the present time.

Before the botany and zoology departments were combined to form the department of biological sciences, botany faculty and students used the herbarium extensively. However, in the past few decades, biological research focused less on plant taxonomy and more on cellular and sub cellular levels of organization. This led

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to an overall decline in herbaria use. Nevertheless, David Peart, who is responsible for directing the herbarium, states:

Our view of life on earth is undergoing two great revolutions. Both of these fundamentally alter the way we value plant museums like Dartmouth's Jesup Herbarium. First, we are presently in a golden age of evolutionary synthesis; we are beginning to study the molecular basis for the diversity of life, thus integrating all levels of biological organization into one coherent whole. Second, human activities are changing the face of the planet, altering habitats and climate, and increasing extinction rates to levels not seen on earth since the asteroid impact wiped out the dinosaurs and more than half of the species on the planet. We have a new appreciation for biological diversity; documenting patterns in the diversity of life and understanding their ecological basis are high priorities in modern biology and conservation science. And the diversity of plants, at the base of the food chain, is critical in this exploration. Herbarium specimens are our standards for species identification, and the locations of past collections provide a baseline for documenting how plant distributions respond to climate change and the

invasive species that respond dramatically to human influence.

Consequently, biologists who recognize the importance of plant diversity as the foundation of the food chain have gained an increasing appreciation for the value of herbaria.

Lisa Palmer and Alice Schori, a field botanist who also participated in the recent assessment of biological communities for the town of Hanover, are currently performing the first complete inventory of the Jesup Herbarium as they sort and box each individual specimen according to its geographic origin. Dartmouth has specimens from every region of North America, in addition to extensive collections from other parts of the world. When the collection is moved to the fourth floor of Gilman, Dartmouth will retain only those specimens that occur in New

Hampshire and Vermont. According to Peart, the remainder of the collection will be sent to various herbaria around the world, and special care is being taken to insure that the specimens are traded or donated to locations in which they will be "most accessible to the research and conservation communities." The Jesup Herbarium already has an exceptionally strong collection from New Hampshire and Vermont, and it is extremely rich in species and history. Peart hopes to use trades with other herbaria and student projects on plant distribution and diversity in order to fill the few gaps that do exist in Dartmouth's regional collection.

Peart, Palmer, and Downs are enthusiastic about the current herbarium project, noting that it gives them the opportunity to get to know the herbarium and the treasures it contains more intimately. In addition, the newly located, regionally focused, and computerized herbarium will be more accessible to students and faculty than ever before. Such a project comes at a great time, when biologists worldwide are gaining an increased appreciation for the importance of biodiversity and for the herbaria that are essential to its study.