CORNELL UNIVERSITY, LIBERTY HYDE BAILEY CONSERVATORY GREENHOUSE
(Tower Road West Purple Conservatory 1023A)
236 Tower Road
Ithaca
Tompkins County
New York

HABS NY-6395
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN BUILDINGS SURVEY
National Park Service
U.S. Department of the Interior
1849 C Street NW
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Location: 236 Tower Road, Ithaca, Tompkins County, New York. The greenhouse is located at latitude: 42.447768, longitude -76.476844. This coordinate represents the south entrance door on Tower Road. This coordinate was obtained on September 27, 2012, using Google Earth.

Significance: The Liberty Hyde Bailey Conservatory Greenhouse is significant for its association with the Cornell University College of Agriculture and Life Science's internationally acclaimed Plant Science program and for its association with two of the world's foremost palm taxonomists in the first half of the 20th century – Liberty Hyde Bailey and Harold E. Moore – and their long term research on palms, and as an example of the work of the horticultural architect Lord & Burnham Co. On April 22, 2011, the New York State Office of Parks, Recreation and Historic Preservation determined that the greenhouse met the criteria for inclusion into the State and National Register of Historic Places.

Description: The greenhouse is rectangular in plan, 40' wide by 93' long, with a steel-framed curved-eave gable structural system that is approximately 18' tall. The steel frame rests on a 1' thick reinforced concrete foundation wall that is 2'-6" above grade and extends 4'-0" below grade. The overall height of the greenhouse is approximately 20'-6" to the ridge. The roof slope is 7½ in 12. There is a single door located at the south gable end facing Tower Road; however, the greenhouse is commonly entered at the north end through a 12' wide by 6' long gabled roof glazed vestibule that attaches the greenhouse to the Plant Science Building. The vestibule is entered through doors in both the east and west sides and also from the Plant Science Building.

The greenhouse is eleven bays long, with the steel structural frame of each bay spaced at 8'-4" on center. The interior is divided into two sections by a glazed partition. The two sections operate as separate biomes, the north section, closest to the Plant Science Building, is the "Student House," which is five bays long, and the south section, the "Palm and Ornamental House," is six bays long.

Perimeter benching is installed in both sections of the greenhouse, with earth floors underneath. The Student House also has four rows of fixed benches, also with earth floors underneath, separated by concrete walkways. The Palm and Ornamental House has two large planting beds at the floor level, divided by a central concrete walkway, with tiered benches over the west planting bed, and a small pool at the south end of the east planting bed. All walkways are a finely finished double layer (structural and finish) concrete slab approximately 12 inches thick.

The steel structural frame is constructed of bolted steel plates and angles, which form a continuous structural frame from the sill through the curved eaves to the cambered fink roof truss (also known as a modified scissors truss). The truss has sloped bottom chords and high flat center chord to accommodate the height of palms and other ornamental plants. The structural frame bears on a cast iron sill bolted to the concrete foundation walls.

Each structural steel frame consists of a ½” x 5” plate with two 2” x 2” x ¼” angles bolted to each side of the plate. The steel frame continues as the top chord of the truss and the angles continue as the truss bottom cord. The lower truss webs are single 1¾” x 1¾” x ¼” steel angles and the upper pair of webs are 2” x 2” x ¼” steel angles. 1½” x 2” x ¼” steel angle purlins laterally brace the frames and support the wood glazing rafters. The eaves are laterally braced by cast iron gutters. The framing is attached to the cast iron sills and gutters with cast iron lugs, which are marked with Lord & Burnham part numbers 68 and 765/766.

The gable ends and an interior partition are divided into seven bays, framed with vertical ½” x 5” steel plates. The interior partition is glazed with non-original plastic. Original wood exterior and interior doors have been replaced with aluminum door assemblies, except for the south exterior door, which is a wood replacement.

The greenhouse roof is glazed with lapped 1/8” x 16” x 24” glass set into putty on Tidewater tank-grade cypress rafter bars, with replacement aluminum bar caps, which were installed at some point after the 1940s to protect the exterior putty. The radiused eaves have two panes of curved glass. The rafter bars are connected to the steel frame with cast iron clips marked with Lord & Burnham part number 3211. The rafters span from the ridge to the gutter, and bear on the intermediate steel angle purlins. The continuous roof vent sash are approximately 2’-4” wide and were originally cypress, but have been replaced with aluminum sash. The cypress side wall sash are 3’-½” high by 8’-2½” long, but operate as a continuous unit, and are supported by, and hinged at, the cast iron gutters. The cypress sash at the gable ends are non-operable.

The mechanical system includes under bench steam heat piping, incandescent lighting, automated roof vent machine operators, and manual side vent operators. Heating water and 100 amp power are supplied to the greenhouse from the basement of the Plant Science Building. Rows of three single incandescent lamps are provided over the side and center aisles of the Student House, and a single incandescent lamp is hung at the ends of the Palm and Ornamental House, with two rows of three lamps over the side aisles.

Steel and cast iron steam distribution piping, manifolds and radiation piping were installed in about 1975 and match the layout of the original system. Heating is provided by vertical rows of steam water pipes at the foundation wall under the perimeter benches. The supply and condensate return mains are located in the basement of the Plant Science Building and are readily accessible via the basement and the pipe trench which runs under the vestibule and greenhouse.

Originally passive ventilation of the greenhouse was accomplished by manually-operated roof and side vent sash. Presently the roof vents are controlled by two modern automatic electric roof vent machines per vent, which operate off of a thermostat, but can also be manually opened by Lord & Burnham rack and pinion ventilating apparatus. The side vents are manually operated by Lord & Burnham arm and rod ventilating apparatus.

History: To anticipate the growth of Cornell University into the 20th century a general campus plan was developed in 1910 by landscape architects Warren H. Manning and Bryant Fleming,

illustrating for the first time an arrangement of buildings for the College of Agriculture. The campus plan located the College's academic buildings around a formal "Ag Quad," constructed on the north side of Tower Road, and a less formal arrangement of accessory agricultural buildings that were constructed east of the Ag Quad, including a greenhouse range. In 1922 the state architect, Lewis F. Pilcher, developed a campus plan specifically for the College of Agriculture, based on a detailed program for the classroom, laboratory, and equipment needs of the College's twenty-four departments. The Pilcher plan provided sites for a number of new buildings to complete the Ag Quad, and also located the College's greenhouses along Tower Road.

The College had begun in 1909 to replace deteriorated 19th century wood-frame greenhouses with an extensive range of iron-frame "glass house laboratories," which College of Agriculture Dean Liberty Hyde Bailey considered an integral part of his vision for the College's teaching, research, and extension service work. By 1917 the College had completed a range of seventeen modern iron-frame greenhouses.

In the late 1920s the College began to extend the Ag Quad with construction of the Plant Science Building, which was completed in 1930 with a direct connection to the existing headhouse for seven of the iron-frame greenhouses located along Tower Road, and for one new attached greenhouse – the Liberty Hyde Bailey Conservatory Greenhouse.

Constructed in 1931, just after completion of the Plant Science Building, the Liberty Hyde Bailey Conservatory Greenhouse replaced a large iron-frame Floriculture greenhouse that had been on the same site. It is likely the greenhouse design was prepared by Lord & Burnham Co., though the contract drawings were prepared by the Division of Architecture of the State of New York Department of Public Works. This was a common arrangement for both private and public greenhouses during this era. The $21,380 contract for fabrication of the greenhouse was awarded to Lord & Burnham Co. on August 19, 1930. Additional contracts were award to William Dechert for heating ($4,180) and plumbing ($2,360) and to Williams Electric for electrical work ($285). The greenhouse was completed by the end of 1931.

The greenhouse was accessed directly from the lowest grade level of Plant Science Building, allowing students and faculty to walk directly from academic classrooms into the greenhouse, facilitating Bailey's vision of incorporating living plant collections into the teaching of botany. An incredibly diverse range of both temperate and tropical plant families were maintained in both sections of the greenhouse to accommodate the College's educational, research, and extension needs.

In addition to its role as a classroom, the greenhouse functioned as a laboratory for former Dean Liberty Hyde Bailey and Prof. Harold E. Moore, Jr.. The greenhouse's Palm Collection represented the research begun by Bailey in the 1920s, and continued by Moore, who joined Bailey at Cornell in 1948. Bailey and Moore's palm research was continued by Prof. Natalie Uhl, culminating in 1987 with the publishing of Moore and Uhl's *Genera Palmarum*, the field's comprehensive standard reference work.

In 2009 the greenhouse's plant collections were utilized by six College of Agriculture and Life Science departments to teach sixteen different classes and for educational outreach to the community.

In 2011 Cornell University closed the greenhouse, due to its advanced state of deterioration and the unacceptable health and safety risks it posed to students, faculty, staff and the public. Cornell University plans to demolish the greenhouse in 2013 and replace it with a new greenhouse on the same site.

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Historian: Zach Watson Rice, Li/Saltzman Architects, PC, 2012.

Project Information: The documentation project was undertaken by Li/Saltzman Architects, PC, with funding by Cornell University Contract Colleges Facilities Services. The documentation was completed as a requirement of the New York State Office of Parks, Recreation and Historic Preservation to mitigate the adverse impact of the demolition of the Liberty Hyde Bailey Conservatory Greenhouse.