NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

1. Name of Property

historic name: Ladd Observatory

other name/site number: _____

2. Location

street & number: 210 Doyle Avenue (corner of Hope Street)

not for publication: N/A

city/town: Providence vicinity: N/A

state: RI county: Providence code: 007 zip code: 02906

3. Classification

Ownership of Property: Private

Category of Property: Building

Number of Resources within Property:

Contributing	Noncontributing	
1	_____	buildings
_____	_____	sites
_____	_____	structures
_____	_____	objects
1	0	Total

Number of contributing resources previously listed in the National Register: 0

Name of related multiple property listing: N/A

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this X nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property X meets ____ does not meet the National Register Criteria.

____ See continuation sheet.

Frederick D. Williamson — 25 May 1993

Signature of certifying official — Date

State or Federal agency and bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria.

____ See continuation sheet.

Signature of commenting or other official — Date

State or Federal agency and bureau

5. National Park Service Certification

I hereby certify that this property is:

✓	entered in the National Register ____ See continuation sheet.	Beth A. Savage	6/6/00
____	determined eligible for the National Register ____ See continuation sheet.		
____	determined not eligible for the National Register		
____	removed from the National Register		
____	other (explain):		

for Signature of Keeper — Date of Action

6. Function or Use

Historic:	EDUCATION	Sub:	research facility
Current:	EDUCATION	Sub:	

6. Function or Use

Historic: EDUCATION — Sub: Research facility

Current: EDUCATION — Sub: Research facility

7. Description

Architectural Classification:

Classical Revival

Other Description:

Materials: foundation STONE; walls STONE, BRICK; roof METAL: Copper, ASPHALT; other

Describe present and historic physical appearance.

X See continuation sheet.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties: locally
Applicable National Register Criteria: A, C

Criteria Considerations (Exceptions): N/A

Areas of Significance: ARCHITECTURE, OTHER: HOROLOGY

Period(s) of Significance: 1891-1916

Significant Dates: 1891, 1916

Significant Person(s): N/A

Cultural Affiliation: N/A

Architect/Builder: A Stone, Carpenter & Willson

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

X See continuation sheet.

9. Major Bibliographical References

_X_ See continuation sheet.

Previous documentation on file (NPS):

____ preliminary determination of individual listing (36 CFR 67) has been requested.
____ previously listed in the National Register
____ previously determined eligible by the National Register
____ designated a National Historic Landmark
____ recorded by Historic American Buildings Survey # _____
____ recorded by Historic American Engineering Record # _____

Primary Location of Additional Data:

_X_ State historic preservation office
____ Other state agency
____ Federal agency
____ Local government
____ University
_X_ Other -- Specify Repository: Brown University Archives

10. Geographical Data

Acreage of Property: less than one acre

UTM References:	Zone	Easting	Northing		Zone	Easting	Northing
A	19	300760	4634480	B			
C				D			

____ See continuation sheet.

Verbal Boundary Description: _X_ See continuation sheet.

Boundary Justification: _X_ See continuation sheet.

11. Form Prepared By

Name/Title: Arnold N. Robinson, Asst. Dir. & Carla Swanson, Intern

Organization: Providence Preservation Society Date: Jan. 92
Street & Number: 21 Meeting Street Telephone: 401-831-7440
City or Town: Providence State: RI ZIP: 02903

Description

The Ladd Observatory sits on the northeast corner of the intersection of Doyle Avenue and Hope Street in Providence, Rhode Island. The overall form of the building is consistent with later 19th century astronomical observatories: a rectangular main block with a projecting foretower topped with a dome. Inside the building are the astronomical instruments, as well as classroom and library facilities, as befitting a university observatory. This site is one of the highest land masses in the City of Providence (at an elevation of just under 200 feet).

The building was designed by the renowned architectural firm Stone, Carpenter & Willson in the Classical Revival style, and is built of brick with stone ornamentation. The main portion of the building is rectangular in form with a flat roof. The four-foot high foundation of the building is constructed of ashlar brownstone and is pierced on all sides by rounded window openings. The fenestration on the first floor of the main building consists of two-over-two double-hung, round-headed sash, set in openings framed by stonework. The windows on the upper portion of the main building are small ocular windows, aligned with the larger windows below them. A stone string course delineates the floor levels. There is a large brick chimney rising from the south side of the roof of the main building.

Projecting from the west side of the main block is a two-story tower which has a five-sided first story and a cylindrical second story. The roof of the tower is a rotating dome, with a sliding aperture for telescope usage. The dome is made from copper sheets on a steel framework.

A walkway wraps around the exterior of the middle portion of the tower, on the same level as the roof of the main building. This walkway is supported by curved brackets set into the walls of the tower, and is surrounded by a wooden balustrade, which continues around the roof of the main building. Within the balustrade, on the roof of the main structure is a substantial wooden deck, an original feature designed to provide a location for viewing the night sky with the naked eye. This deck is reached from the main interior staircase.

The main entrance to the observatory is located in the projecting tower and is distinguished by its elaborate stonework surround and entablature bearing the words "LADD OBSERVATORY" in raised letters which are in turn surmounted by the Brown University seal. The entrance is reached by a set of six stone steps (both sides of these were originally flanked by a brownstone railing and balusters, which have since been

removed). The door itself is paneled and constructed of oak, and has a single window set in its center. Windows in the tower portion of the observatory are narrow round-headed one-over-one double-hung sash and are set in stone surrounds similar to those on the main building.

Inside the tower itself is a substantial masonry pier which is built into the bedrock of the hillside, and extends upward to the second story, entirely separate from the building around it. This interior pier supports the main twelve inch telescope. This is the principal instrument in the observatory is the refracting telescope of twelve inches aperture and fifteen feet focal length. The lens was designed by Professor C.S. Hastings of Yale University and made by John A. Brashear of Pittsburgh, one of only three master lensgrinders in the world at that time. The lens is actually two pieces of glass, a crown and a flint, ground independently then joined. The German-type equatorial mounting of the telescope and the clock drive which make the twelve-inch telescope follow the stars were made by the Saegmuller Company of Washington, D.C., which also designed and positioned the three-inch transit telescope. This instrument was mounted on a brick pier and placed in the wooden wing east of the main building.

In the first floor level of the tower is a clock vault with two master clocks (1889), a sidereal (or "star time") clock by Riefler and a mean solar (our "normal" time) clock by Molyneux (c. 1850). On the ground floor of the main building (see attached floor plan), located off the center hallway are: the library, a lecture room fitted with illuminated transparencies illustrating celestial objects. The hallway itself houses a chronograph and various meteorological instruments. Interior finishes are plain, with beaded board wainscoting in the hallways, and painted plaster walls in all rooms. Window and door surrounds are is executed in restrained trim mouldings. In the basement are located a workshop and darkroom, both intact but neither presently used. Except for the installation of electricity and baseboard heating, the building remains virtually unchanged since the day its doors opened one hundred years ago.

Attached to the east side of the main building is a single-story wood frame structure that was built at the same time as the observatory. The building was constructed to house two transit instruments that were used for the transmission of time signals to all of Providence's businesses and industries. This structure has three four-over-four pane windows on its south elevation, no windows on its east elevation, and two doors and three windows on its north elevation. The exterior of the building is clad in wooden flush board siding and has narrow wooden corner boards and water table.

Photographs

3. Photographer: Arnold N. Robinson
4. Date: December 27, 1992
5. Location of negatives: Rhode Island Historical Preservation Commission

Above information pertains to all photographs.

6. View: Exterior view from northwest.
7. Photo #: 1

6. View: Central hall, first floor of main building, looking from east. On the right hand side of the photographs, note the clock room door, located in the main tower.
7. Photo #: 2

6. View: Classroom, first floor.
7. Photo #: 3

6. View: Transit room, first floor
7. Photo #: 4

6. View: Main telescope, observatory tower
7. Photo #: 5

Significance

Ladd Observatory (of Brown University) is significant as the work of the architectural firm Stone Carpenter, & Willson, the dominant architectural firm in Providence during the late 19th century. Unlike other university observatories in New England, Ladd was not constructed solely for academic research. Instead, it was built with three distinct missions: academic research, education of the overall Brown community and the public at large, and marking and transmitting accurate time signals. Ladd Observatory was constructed with the most up-to-date technical knowledge of its day, and was equipped with the highest caliber equipment for the late 19th century. The observatory has continued since its dedication to educate the Brown community and the people of Providence and the state of Rhode Island. The Observatory remains open to the public and has always served an important educational role. Finally, Ladd Observatory also provided a vital service to the people of Providence by transmitting time signals taken from stellar observations. These transmissions were the only means of keeping and regulating time in the city from 1893 until 1916 (when the time signals by radio from the U.S. Naval Observatory were sufficiently well established).

History:

In 1884, Professor Winslow Upton accepted a position at Brown University as professor of astronomy with the provision that an astronomical observatory be constructed. He made this condition because Brown's existing astronomy program was small and had only a small observatory atop one of the University's buildings on the main quadrangle. This facility had only basic telescopes and suffered from light pollution from nearby buildings. This small facility limited the number of students that Upton could instruct in astronomy, and the quality of the research that could be performed.

By 1889 no steps had been taken toward constructing a new observatory, and Professor Upton gave the university an ultimatum: build an observatory or find another astronomy professor. At the 1889 commencement banquet, then-Governor Herbert W. Ladd answered the ultimatum by pledging funds necessary for its construction. Plans were completed in the winter of 1889-1890 and actual construction began in May, 1890.

The property on which the observatory was built was donated to Brown University by Frank W. and Knight D. Cheney, who owned the Connecticut silk manufacturing company of Cheney Brothers. They had strong family roots in

Providence (their mother was Waitstill Dexter Shaw, of the Providence Dexters), and the land had been in their family for some time. They had platted the land bounded by Hope, Doyle, Observatory, and Morris in 1887 for development as house lots under the name of the "Highland Plat".

The brothers sub-divided the area in 1888, created the street now known as Observatory Avenue, and began selling the lots. Only a few were sold as of 1889, when the brothers answered Upton's call for an observatory and donated three lots of land near the summit of the hill for that purpose. The land was ideal because of its height, which provided an unobstructed view of the horizon, and because of the relative darkness of this fairly undeveloped neighborhood, and its convenient location, a short walk from campus and near the Brook Street horse car lines. In the midst of the lots the Cheneys gave to Brown was a house at 206 Doyle Avenue (now demolished) built by Hepzibar Damon Carney in early 1889.

The architectural firm of Stone, Carpenter & Willson were chosen to design the observatory building. Stone, Carpenter & Willson were a prominent firm responsible for many Providence buildings of the time, including the Providence Public Library, Providence's Union Station, and Brown University's Pembroke Hall, all of which are still standing today. The firm of Stone, Carpenter & Willson was the joining together of three of Providence's most prolific architects of the late nineteenth century. The firm was the first in Providence to achieve the scale and degree of professional training common in architectural firms today.

Alfred Stone (1834-1908) was a native of East Machias, Maine, and came to Providence in 1859, joining the office of Alpheus C. Morse, and in 1864 he entered into private practice. Charles Carpenter (1854-1923), a Pawtucket native, entered Stone's office as an apprentice, and became a full partner in 1873. By the early 1880s, the firm was well established as a leader on the Providence architectural scene. The firm gained a new level of professionalism when Edmund R. Willson (1856-1906) joined the firm in 1882. Wilson had graduated from Harvard in 1875, studied architecture at the Massachusetts Institute of Technology, spent two years at the Ecole des Beaux-Arts in Paris, worked with Peabody & Stearns in Boston, as well as McKim, Mead & Bigelow in New York. After only a year with the firm, Willson became a full partner in 1893.

While Stone, Carpenter, & Willson produced some of the finest Queen Anne-style buildings in Providence, it is the buildings in the American Renaissance style that put the firm in the forefront of American architecture in the late 1880s and 1890s. The firm's preeminence in

Providence and Rhode Island between 1880 and 1906 was successfully challenged only by nationally prominent firms, such as McKim, Mead, & White's receipt of the Rhode Island State House Commission.

Sketches of the Ladd Observatory design and floor plans for the observatory were featured in the July 19, 1890 issue of the prestigious publication American Architect and Building News. Ladd Observatory illustrates the very beginnings of the change in the firm's architectural sensibilities that was taking place in the late 1880's. Their buildings of the 1880s -- like the Conrad Building (1885) or the National Exchange Bank (1887) at 375 and 61 Westminster Street, respectively, show their use of the Queen Anne style. However, around 1890, the firm began a shift toward a refined, ornamented "American Renaissance" classicism. Ladd Observatory can be seen in its place as one step in the evolution of that new style. Other buildings which followed Ladd Observatory in this style are the Lauderdale and Francis Buildings (1894), side by side at 144 and 150 Westminster Street, the Providence Public Library (1898-1900), and the Union Trust Building (1900-1).

Equipment had trickled in during construction and when the twelve inch equatorial telescope arrived in the autumn of 1891 the observatory was ready to open. On October 21, 1891 a formal ceremony was held at the site.

Professor Upton had from the beginning intended the observatory to provide more than just a place for students majoring in astronomy. Specific academic undertakings would occur there, but only alongside the instruction of all Brown students and the service and instruction of the public at large. Upton's three faceted education plan was maintained until city lights became a deterrent to serious academic research. At that time the observatory's purpose became focused on educating Brown students and the general public. The construction of the Ladd Observatory greatly increased Upton's (and Brown's) ability to instruct students in astronomy, and the quality of the research that could be conducted.

Professor Upton also conceived the observatory as a transmitter of time signals. A Rhode Island law gave Ladd Observatory a monopoly in the distribution of these time signals throughout the state, since they were the only facility suited to the task. The observatory sold the signals to the Rhode Island Protective Company which in turn provided the time to its customers. In this way railroads, business, industry, and citizens in Rhode Island were able to accurately regulate their day. The concept of a "standard time" (and the science of timekeeping) really developed in the 19th century as industrialization and the growth of the railroads created a

greater need for regularized timekeeping, culminating in the establishment of standard times zones.

Under Upton's direction, the observatory secured two (and later a third) master clocks and a Seigmuller transit instrument, and a program of the determination of time from the stars became a regular part of the observatory's work. The scientific method for determining the correct time was based on transit observation. An observer would sit in the transit room, looking through one of the telescopes, and watch certain stars cross the hairline in the transit. The hairline marks an imaginary north-south line, called the meridian, directly above the instrument and the observer. When a certain star crosses the meridian, the observer activates a machine called a chronograph. This provides a written record which is then compared to the setting of the clocks. If the stars pass the meridian after a predicted time, the clocks are too fast. If the stars pass before the expected time, the clocks are too slow. The process was a fool-proof way to synchronize clocks around the world.

In 1898 the university purchased the eastern-most tract of land that now comprises the Ladd Observatory lot. It was purchased because Professor Upton wished to have more open, grassy area next to the observatory. It appears that there was a building, probably a house, on this tract when it was bought, and it was then demolished.

The observatory continued to determine time even after the U.S. Naval Observatory began distributing time via radio in 1916, but the observatory's role as the principal timekeeper of Rhode Island had ended by 1916. Meanwhile, Brown astronomers continued to perform regular observations, occasionally collaborating with Harvard or Yale. In 1932 a program of observing the occultations (or eclipses) of stars by the moon was implemented. This work enabled astronomers to determine precisely how the moon was moving about the earth.

Monthly open nights for the public were initiated in 1931. These nights would include lectures and demonstrations by various professors as well as views through the telescope if the night was clear. In 1932 a group of amateur astronomers met at Ladd and formed an amateur astronomical society which they named the "Skyscrapers." While the Skyscrapers now meet in Scituate, another organization of amateur astronomers, the Astral Observers of Rhode Island now holds its monthly meetings at Ladd.

During World War II the observatory's time signals were used to signal daily air raid sirens, and the observatory and some of its equipment were used during this time as a national training center for Navy navigators.

Until the early 1970's Providence fire and police departments continued to receive and use time signals transmitted by the observatory. In 1973 the last time signal was sent out. The clocks, called chronometers, were stopped and put on display along with the telescope that had been used to calibrate them. Then, in 1985, a restoration project began. Horologist M.L. Passano spent eight months bringing the four clocks, including the prized Riefler #35 master clock, back to life and in perfect running order.

Also still found within the observatory is the twelve-inch telescope with the Brashear lens. It has never been motorized and is moved either manually or (if it cannot be reached) by means of steering wheels located on the side of the mount. The click drive is weight driven and must be wound at the beginning of each night's observing, while the dome is opened by means of ropes attached to each side of the slit (opening) and must be moved (rotated) via a giant pulley.

The construction of houses in the Hope Street-Doyle Avenue vicinity, street lights, and pollution have greatly limited Ladd's potential as the site of scientific research, and the need for the distribution of time signals is no more. In all other respects, however, Ladd Observatory today still stands and serves as it did at its opening one hundred years ago. It is still used by Brown University students each week as an instructional tool, and by the general public by means of its guided open houses scheduled weekly and its accessibility to groups for special viewings.

Major Bibliographical References

Andrews, R. Benjamin. "Final Report of Observatory Committee." 1892, John Hay Library, Brown University.

Christensen, Deborah. "Telescope at Ladd Lets Public Scan the Heavens." Providence Journal Bulletin, October 2, 1978.

DiPippo, Peter, ed. Through the Looking Glass: A publication of the Friends of Ladd Observatory, Vol. 1, no. 1, (Spring, 1990)

Jordy, William H. and Monkhouse, Christopher P. Buildings on Paper, Brown University, Rhode Island Historical Society, and Rhode Island School of Design, 1982.

Loveridge, G. Y. "The Cry of Noon." Providence Journal Bulletin, April 17, 1955, pp. 3-4.

Morgan, Thomas. "Stargazing for Almost a Century." Providence Journal Bulletin, 1986.

No author. "Sketch for the Ladd Observatory: Brown University: Providence: Stone, Carpenter & Wilson, Arch'ts." American Architect and Building News; July 19, 1890.

No Author. "Astronomy at Brown University." n.d., John Hay Library, Brown University.

No Author. "Astronomy at Brown University." Providence Journal, January 22, 1900.

No Author. "Ladd Observatory 95 Years." October 21, 1986. John Hay Library, Brown University.

No Author. "Tours of Stars Taken at Brown." New York Times April 26, 1936.

Passano, Michael L. An Introduction to Precision Clocks at Ladd Observatory, 1986, John Hay Library, Brown University.

Upton, Winslow. letter dated May 8, 1884, John Hay Library, Brown University.

Verbal Boundary Description and Justification

The boundaries follow the lot lines for Lot 265, Plat 8, in the City of Providence, Rhode Island.

Beginning at the property's northwest corner on the southeast corner of the intersection of Hope Street and Observatory Avenue, thence running in an easterly direction in the south line of Observatory Avenue for a distance of 261.69 feet, then southerly for 141.579 feet to a point in the north line of Doyle Avenue. From that point, running in a westerly direction 200 feet to the eastern property line of the property known as 206 Doyle Avenue (Plat/Lot # 8/267), then northerly 100 feet, then in a westerly direction 50 feet, then southerly 100 feet to a point in the north line of Doyle Avenue. Then 70.90 feet in the north line of Doyle Avenue to the northeast intersection of Doyle Avenue and Hope Street. Then running in a northeasterly direction for 160.51 in the east line of Hope Street to the point of beginning.

Justification

The boundary for this National Register listing incorporates the entirety of lot (Play 8, lot 265), on which the Ladd Observatory is located. This includes the original lots conveyed to Brown University by Frank W. and Knight D. Cheney in 1890, and the two lots to the east which were purchased by Brown University for observatory purposes in the early twentieth century.

It should be noted that Brown University now owns the lot at 206 Doyle Avenue, which is surrounded on three sides by the observatory property. While Brown University now owns this property (purchased in 1972), it has historically been independent of the observatory in ownership and use, and is therefore not included in this nomination.