

HYDRAULICS LABORATORY



Fig. 1. Hydraulics lab from Lake Mendota c. 1940. The sections from left to right are: the c. 1890 pump house, the 1929 tank house, and the 1905 hydraulics lab. A 1970s addition added outdoor stair cases to the exterior of the lab section. [series 9/2 Pumping Station, jf-27]

The hydraulics building is a combination of three separate buildings, the pump house that dates from at least 1890, the hydraulics laboratory erected in 1905, and the tank house that connects them from 1928. The building now houses hydraulic and environmental engineering.

As early as 1890 there was a pumping station on the shore of Lake Mendota to supply water to the university. Very early on this pump was also required to supply the state capitol building with water delivered through a line running up State Street.

When engineering professor Daniel Mead came to the university in 1904 he had a strong inclination to do research, and began a campaign to remove the study of hydraulics from its cramped quarters in the engineering building on Bascom Hill. He consulted with the university's supervising architect J. T. W. Jennings on the design and placement of a suitable building for hydraulics research, but for financial reasons the building was put off until 1905. By the time work commenced in the fall of 1905 architect Jennings had been replaced by Arthur Peabody, who judging from extant drawings left the interior arrangement and layout of the building alone and made alterations to the design of the exterior. Construction was begun too late in 1905 to finish before winter came. The regents report of 1904-1905 says that "the building was temporarily enclosed for instructional use during 1905-6 ... and has by its removal relieved to a slight extent the congestion in the main engineering building."² The new building stood by itself on the lakeshore about 80 feet west of the old university pumping station.

The new hydraulics lab comprised three stories above a basement, forty eight by ninety eight feet. In a feature magazine article about the new building, professor Mead describes the layout in detail.¹ The basement contained the main pump to draw in lake-water and supply it to the various

channels, weirs, racks and models in the labs, which required large volumes of water (30,000 gallons per minute) at low head. Also in the basement were large measuring tanks (10,000 cubic feet total), a laboratory for special work. The first (ground level) floor, intended mainly for advanced research, contained the large head race and channel, more pumps and filters, and a mezzanine around the main pump in the basement. On the second floor were the offices, classrooms, and a lecture hall. It was intended that the lab eventually be connected to the pump house by an addition (called the tank house) to the east of the lab. The illustrations that accompany Dr. Mead's article show the tank house connection already built, but he states in the article that it will be built "soon."

In Dr. Mead's article he refers to a plan to construct a reservoir on the bluff above the lab, to provide a source of water at a constant head. In 1914 this reservoir was constructed, designed by Peabody and built by contractor J. Roherty. It holds 220,000 gallons of lake water, and was filled through a ten-inch pipe from the lab. Water flowed back to the lab down the 50 vertical foot drop through a sixteen inch pipe and a series of control valves and gauges. The reservoir is fifty feet in diameter and sixteen feet deep. The reinforced concrete top was designed for use as a student gathering spot, with a short parapet wall, and steps down to it from Observatory drive, behind Muir Knoll. The use of this reservoir was discontinued in the 1950s after the development of constant pressure pumps made it unnecessary. It still provides a beautiful view of Lake Mendota over the bluff.³

Just after a 1915 state appropriation for upgrading the pump house and its equipment for fire protection but before the work could be done, the dome on Bascom Hall caught fire and was destroyed. Ironically the only thing that saved the rest of the old building was the long forgotten water tank in the base of the dome, the burning dome collapsed into the tank and was quenched. That tank had been the original holding tank for the first university pump. After the Bascom fire, the pump house project was completed, at a cost of about \$16,000 a large two-story building with no second floor, giving an open room clear to the roof. Plumbing hookups enabled the hydraulics lab to exchange water and pumping power with the pump house. The hydraulics and pump house buildings were still otherwise separate although 1923 drawings indicate that the space between the two was occupied by large tanks and sheds.⁴

In 1928 contractor J. P. Cullen finally built the addition to the hydraulic lab that connected the lab with the pumping station, at a cost of \$60,000. This section of the building held large settling tanks and pumps to process lake water for use by the university. This addition brought the hydraulics building to its current configuration. A series of major remodelling projects in the 1970s and 1980s removed much of the old interior of the building but left the exterior intact except for the addition of stair wells on the west and south sides. Also in the 1980s with gradual shifts of program emphasis the building was renamed "The Water Science and Engineering Laboratory." The pumping station section now has a second floor, and is still a few feet shorter than the tank house and hydraulics lab sections. The complete structure [see Fig. 1.] is now about 230 feet in length. Much significant work in hydraulic study and investigation has been done in this complex, by Dr. Mead and his successors. Plans are now being discussed to add further to the building to connect it on the west to the limnology building.

1) *The Wisconsin Engineer*, March, 1906, p. 149.

2) *Regents Report*, 1904-1905 p. 12

3) *The Wisconsin Engineer*, October 1916 p. 30.

4) *The Wisconsin Engineer*, February 1923, p. 85, April 1908.