

# OLD HEATING PLANT

*The third of the university's central heating plants, this plant went into service in 1909. It provided heat to the whole University until 1959 when the Charter Street plant came on line. It is now used as shops for the University physical plant.*

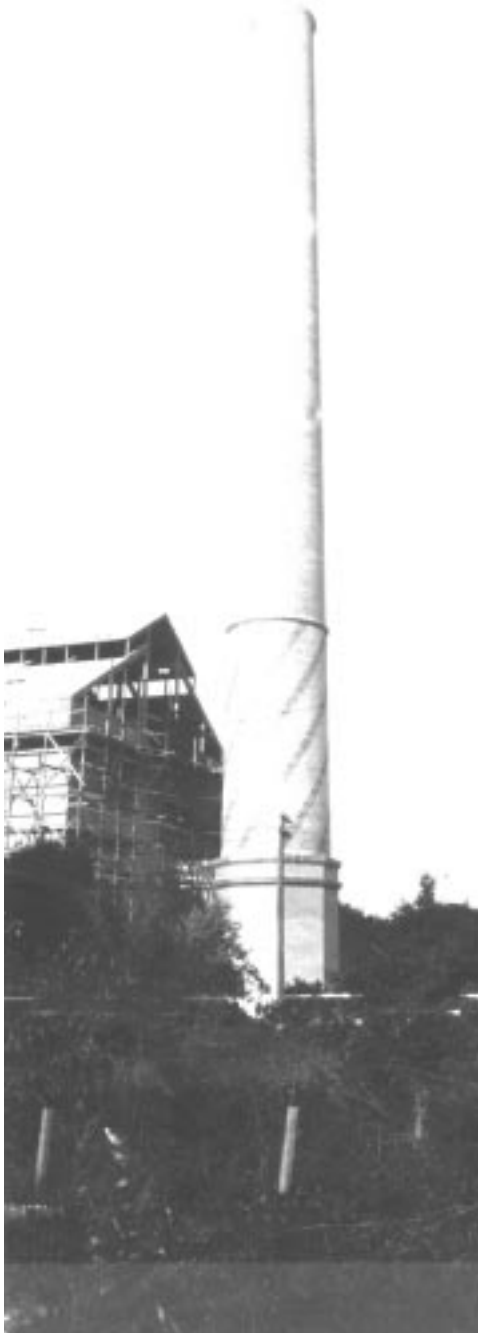


Fig. 1. 1907, the heating plant during construction, after the chimney is finished, but before the main building is done, taken from the south west. [9/5 Heating Plant, jf-31]

In the years before 1888, the university had no central heating plant. The few buildings were heated by wood or coal furnaces and stoves. In 1888 as part of the science hall group (see Appendix A) a central heating station (now Radio Hall) was built for the buildings on Bascom hill. A decade later a second plant (now Agricultural Bulletin) was built to heat and power the agricultural campus buildings. These heating plants served the university well throughout most of the nineteenth century, although the main central plant required expansion several times. However by 1905 a number of factors had arisen which made those old plants insufficient.

The most significant of these was the ballooning size of the campus. When the old plant was built, in 1888, some of the regents drew laughter when they opined that there might someday be an enrollment of 1,000 students at the university. By 1905 the enrollment was over 3000. This enrollment was necessarily served by more buildings. Many of the new buildings were on the agriculture campus (Smith, King, and Agriculture Halls), but the gymnasium, the enlarged Chadbourne Hall, and the new chemistry building increased the size of the central campus needing heat and power. A further spur to the need for a new central power plant was the planning input from consulting architects Laird and Cret who argued that expansion would necessarily take place westward for the agricultural campus and to the south (across university Avenue, where no university buildings had yet been built), further decentralizing the existing 'central' heating plant.

Not all buildings were heated from the central plants. Heating South Hall from the central plant only became a topic of discussion after completion of Agricul-

Fig. 2. The new university heating plant in 1908, University Avenue in foreground, looking south west, possibly from the roof of the chemistry building at University and Charter. [9/5 Heating Plant, jf-32]

ture Hall freed it up for the home economics department. The Washburn observatory and its offices and the solar and student observatories, were still heated by on site stoves and furnaces. The director of the observatories (George Comstock) discovered that the thermal effects from the agricultural heating plant stack and his own chimneys were adversely affecting his observations, and began to agitate for connections of the buildings to the central plant. Also the old heating plants were beginning to age badly. Engineering professor and steam plant superintendent, Storm Bull, had a litany of failures and obsolete equipment for the regents, with harsh observations about the increasing loads being applied to those old facilities.

Professor Bull and university architect Arthur Peabody (who consulted with Philadelphia architects Laird and Cret) began to work on plans for a new central plant, which would incorporate as many of the new developments in central heating as the university could afford. By November 1905 the regents had decided on a site (block 5 of the Brooks Addition, corner of University and Bruen [later Orchard] Streets), they resolved to purchase or condemn the property required to build at that site. Financial problems led them to delay the project until 1907.

Then in the spring of 1907 president Van Hise submitted to the board of regents the plans of "Architect Peabody and professor Bull respecting the new heating plant."<sup>1</sup> The regents adopt the plans and reiterate the previous choice of site and plans to condemn land needed to lay railroad tracks to the site. The resulting condemnation proceeding eventually came down to lawyers, guns and money as the owner A. W. Gratz presented armed resistance to the construction of the rail spur.<sup>2</sup> They also opened bids for the structural steel for the building at the afternoon meeting, selecting the Worden Allen Co. Authorization for bids on the building's construction was also passed.<sup>3</sup>

On June 25, 1907 the construction contract was signed by T. C. McCarthy, an old favorite of the regents, calling for construction of the entire building, except for the chimney and the erection of the structural steel, for \$55,000. The job was to be completed by April 1, 1908. The chimney construction contract went to the Alphonsis Custodis Co. The foundations were ready for the steel erectors by August 27. The slow progress on the heating plant became a concern which architect Peabody voiced in a letter to president Van Hise in December 1907, "the limit of time on the contract is April 15th, 1908 but I believe it will be impossible now to complete the work within that time." He was right. The construction dragged on throughout 1908, Peabody and Bull allowed the chimney contractors an extension on their contract until June 15, 1908. The delays were not all McCarthy's fault. It was a huge project, involving several different contractors, using several relatively unfamiliar technologies (including structural steel framework, reinforced concrete, and a 250 foot chimney, at that time the tallest structure in Madison), and all oversight being handled by Peabody, a newcomer to



the position. Delays were inevitable. Peabody's reports to Van Hise reflect the progress through 1908. In September the coal conveyors were installed, the boilers were in place and connected to the chimney. Mainly piping was yet to be completed. Another incomplete item was grading and leveling around the building. Peabody had counted on using the earth from the tunnel excavation to do this grading, but as if on cue, the coal vaults at the old heating plant behind science hall collapsed and the earth had to be used to shore up those areas.

At last Mr. Peabody says "Steam was turned on in full on Friday night, January 1, 1909 and is now heating the University Buildings."<sup>4</sup> Except for minor finish work, and grading the heating plant was complete. It did not at that time heat any of the agricultural campus buildings, but fed steam only to the 'east loop' which reached as far east as the gymnasium. Not until late in 1909 was the 'west loop' to the agriculture campus completed and additional boilers for that load installed.

The completed building was 86 feet wide and 130 feet long. It was built with concrete foundations, steel framework covered with a new brick which matched very closely the color of the usual Madison sandstone used for previous university buildings.

Of the design, architect Peabody says: "The operation of the building with a central firing deck, a row of boilers on each side, coal bins overhead, and ash pits below lent itself naturally to a central portion, higher than the rest, with a roof of low pitch over this part and lower roofs on either side. This in fact follows the outlines and mass of a Basilica ... This was so simple to do that I surprised myself by finishing very rapidly." Mr. Peabody had apparently forgotten that consulting architect Paul Cret had executed a pair of drawings marked February 1907, now in the university archives, which show the basilica-like design clearly worked out by him. Indeed Mr. Peabody could have finished very rapidly, since only minor alterations were made to Mr. Cret's design.<sup>5</sup>

The 250 foot smokestack was designed for enough capacity to double the 4000 horsepower initially installed. A second heating plant was planned for the area south of the building to be connected to the stack. Because of technological advances (mainly forced draught techniques), the single building was eventually able to drive the stack to its capacity without the addition. The economies of scale, projected by professor Bull, were immediately realized. Comparing 1910 and 1906 showed that heated space went up 20%, enrollment went up 38%, outlay for heating rose only 2.5%.<sup>6</sup> The total cost of the project including tunnels was \$267,523. This consumed a large portion of the university building budget for the period, although Van Hise and the regents were able to replenish the building fund, without much difficulty. The heating plant served the university well, not a single day of school was lost due to the construction or malfunction of the plant. Alterations were made to expand and extend the life of the facility. The red tile roof, skylights and other features were lost along the way. It finally became hopelessly obsolete after the explosion of enrollment after WW II, and was replaced in 1959. It now functions as a sheet metal and janitorial shop for the physical plant. The chimney was removed in 1990 as a precaution against collapse. The top four feet of the chimney were so deteriorated that they were pushed in by hand by the workmen.

1) *Regents Minutes*, April 17, 1907.

2) *Papers of the Executive Committee*, October 7, 1907.

3) *Regents Minutes*, April 17, 1907. *Papers of the Executive Committee*, June 25, 1907.

4) *Architects report for December 1908*, papers of the Executive Committee December 1908.

5) *Peabody, Arthur*, Short Resume of University Buildings, pp. 11-12.

6) Report of the Regents 1909-1910, p. 12, *Wisconsin Engineer*, May 1923, November 1946; *Wisconsin Country Magazine*, January 1939, *Wisconsin Alumni Magazine*, February, 1948.