The Crystal Palace, Sydenham

Illustrations from Hix and from Beaver
Text extract from Chadwick

The Great Exhibition Building (Crystal Palace), Hyde Park, 1851
Being a temporary structure the building was unheated
Sir Joseph Paxton, 1803-65, Designer of the Crystal Palace
Detail of the Hyde Park Crystal Palace showing the Boilerhouse (foreground)
The steam boilers were used to power the exhibits in the Machinery Hall
(As mentioned, the building was unheated)
When the Great Exhibition ended, the Crystal palace was dismantled and transported to Sydenham where it was re-erected (beginning in 1852) with various additions, including an extensive heating system.
The Sydenham extensions included two water towers, designed by Brunel,
each containing 3000 tons of water tanks for irrigating the large pleasure gardens

Glazing work in progress at the Crystal Palaces Sydenham,
Crystal Palace and Park, Sydenham in 1854

Sydenham

Length of nave 1608 ft
Width of nave 312 ft
Height of nave 68 ft
Length of each wing 574 ft
Width of transept (central) 387 ft
Height of transept 168 ft
Height of towers 284 ft
Weight of iron 9642 tons
Area of glass used 1,650,000 sq. ft superficial
Weight of glass used 500 tons
Amount of brickwork 15,391 cu. yd
Hot water piping (12 in.) 50 miles
Total area of main building 603,072 sq. ft

Note the 50 miles of 12-inch heating pipe
As with many of Paxton's building some of the most interesting features were hidden from normal view, but not thereby lacking in importance. Ventilation had been important for the Great Exhibition, and to this was now added the need for heating. This Paxton patterned on his successful experiments in low-pressure hot water heating at Chatsworth. An access roadway ran through the basement storey of the building, and here no less than twenty-two boilers were arranged in pairs, each holding 11,000 gallons of water; one extra boiler was added at the north end for a display of tropical plants, two in the lower storeys in each wing, and two small ones for the fountain basins at each end of the building containing *Victoria regia* and other tropical aquatics. Four pipes of 9 in. diameter were attached to each boiler, two flow and two return, and each boiler heated a certain transverse section of the Crystal Palace: the length of one flow and return was a mile and three-quarters, and the total length of heating pipes of all kinds was nearly fifty miles. The control of this intricate system was said to be by an unspecified new device invented by Paxton and Henderson.

*A description of the heating system*
Paxton in the 1850’s, from a contemporary photograph
The end of the Crystal Palace, destroyed by fire in 1936