Chatsworth - Heating the Conservatories

Text and Illustrations from Hix, Kohlmaier and Woods

Chatsworth House in Derbyshire
Seat of the Dukes of Devonshire
Sir Joseph Paxton, Head Gardener at Chatsworth
Designer of the Chatsworth Conservatories
The heating of the conservatory was effected by no less than eight boilers beneath the building, feeding seven miles of four-inch iron pipe running in corridors high enough for a man to walk upright in them. The fuel for the boilers was also stored underground, and fed to the furnaces by a small tramway. Ventilation was provided by the iron valves in the basement arches, at the gallery level (i.e. at the springing of the main span), and by ventilators at the top of the conservatory when required.
Glazing the Great Conservatory
Section and ground plan of Great Conservatory, showing plants and heating system.
The remains of the Great Conservatory
The building was deliberately blown up in 1920
The Lily House under construction

The famous drawing showing a child’s weight supported by a giant lily leaf
A consideration of the lily house would be incomplete without a further reference to its inhabitants and the ways in which their comfort and well-being were secured. Apart from the main tank there were eight smaller tanks in the angles of the house which held other aquatics: Nymphaea, Nelumbium and Pontederia. The main tank had a central deeper part, 16 ft. in diameter, which contained the soil for the Victoria; embedded in the soil were 4 in. diameter iron heating pipes, whilst 2 in. diameter lead pipes were placed in the shallow part of the tank. The house as a whole was heated by a system of 4 in. iron pipes running round inside the basement walls. Thirty openings between the piers of the basement wall allowed for low-level ventilation, and opening lights in the roof “made to open by simple machinery” gave additional ventilation when required. Four small water-wheels were provided in Victoria’s tank to give gentle motion to the water and a cold water supply was placed above each so that the water temperature could be modified as required (average tank temperature 83°–85°F, house 80–90°F). It is interesting to note that Paxton had foreseen the potentialities of electric light—this nearly twenty years before the invention of the dynamo—but had been unable to use it to help Victoria’s growth due to its expense; how he would have generated it is not clear, but he was certainly interested in, and experimenting with, electro-magnetic phenomena at various times.