In the autumn of 1850, in Hyde Park in London, there arose a most extraordinary structure: a giant iron and glass greenhouse covering nineteen acres of ground and containing within its airy vastness enough room for four St Paul’s Cathedrals. For the short time of its existence, it was the biggest building on earth. Known formally as the Palace of the Great Exhibition of the Works of Industry of All nations, it was incontestably magnificent, but all of the more so for being so sudden, so startlingly glassy, so gloriously and unexpectedly there. Douglas Jerrold, a columnist for a weekly magazine Punch, dubbed it the Crystal Palace and the name stuck.

It had taken just five months to build. It was a miracle that it was built at all. Less than a year earlier it had not even existed as an idea. In 1849 a civil servant Henry Cole visited the Paris Exhibition – a comparatively parochial affair, limited to French manufacturers – and became keen to try something similar in England, but grander. He persuaded many worthies, including Prince Albert, to get excited about the idea of a Great Exhibition, and on 11 January 1850 they held their first meeting with a view to opening on 1 May of the following year. This gave them slightly less than sixteen months to design and erect the largest building ever envisioned, attract and install tens of thousands of displays from every quarter of the globe, fit out restaurants and restrooms, employ staff, arrange insurance and police protection, print up hand bills, and a million other things, in a country that wasn’t at all convinced it wanted such a costly and disruptive production in the first place. It was a patently unachievable ambition, and for the next several months they patently failed to achieve it. In an open competition, 245 designs for the exhibition hall were submitted. All were rejected as unworkable.

Into this unfolding crisis stepped the calm figure of Joseph Paxton, head gardener of Chatsworth House, Principal seat of the Duke of Devonshire. When he learned that the commissioners of the Great Exhibition were struggling to find a design for their hall, it occurred to him that something like his hothouses might work. He sketched out a rough design on a piece of blotting paper and had completed drawings ready for review in two weeks.

So the risks were considerable and keenly felt, yet only after a few days of fretful hesitation his plan was approved. Paxton’s Crystal Palace required no bricks at all, no mortar, no cement, no foundations. It was just bolted together and sat on the ground like a tent. This was not merely an ingenious solution to a monumental challenge, but a radical departure from anything that had ever been tried before.

The Crystal palace was at once the world’s largest building and its lightest, most ethereal one. Today we are used to encountering glass in volume, but to someone living in 1851 the idea of strolling through cubic acres of airy light inside a building was dazzling – indeed, giddying. The arriving visitor’s first sight of the Exhibition Hall from afar, glinting and transparent, is really beyond our imagining. It would have seemed as delicate and evanescent, as miraculously improbable, as a soap bubble. To anyone arriving at Hyde Park, the first sight of the Crystal Palace, floating above the trees, sparkling in sunshine, would have been a moment of knee-weakening splendor.