

CHAPTER III.

FOUNDATIONS.

FROM the inception of the work the subject of foundations was the paramount study of the engineers, the only real difficulties of the task lying below the water. The methods of founding which have been in most common use in the United States were not to be thought of, as the continual wash and scour of the river would have made piles and crib-work useless, while the great depth and rapid current must have rendered coffer-dams very hazardous and expensive. The use of iron columns, sunk by the pneumatic process, was considered; but the conviction was early and confidently formed that a cluster of separate columns resting upon the rock at a depth but little below the scour limit, as would have been the case in the most exposed foundations at this location, would fail to give the stability needed by the channel piers; while it was believed that the sand-bar piers, which are rarely exposed to a strong current, might be founded in a way less expensive, though amply secure. It was also feared that in the absence of pneumatic plant in America, and with the then high prices of iron work, the pneumatic process would prove in its entire execution an unreasonably expensive one.

The opposite action of floods on the two sides of the river, causing a violent scour along the Kansas City shore where the channel lies, but a sand deposit near the north bank, showed that the precautions necessary for the channel piers would be a useless expense if taken at every foundation. The channel must be retained near the south bank on account of the draw, if for no other reason—thus rendering this phenomenon of scour and deposit a permanent one, subject only to such variations as are due to the increased width of channel in an extreme flood. It was therefore thought that if the channel