

completed within it, and the intermediate space, about five feet wide, was filled with stone and sand. An ice-breaker, formed of an inclined sycamore log and a fender of planked piles, was built above the pier site. In February a large dredge, with a steam-engine to drive it, was mounted upon the caisson; it was set in motion on the 13th of that month, and lowered the caisson a few feet. The rising water of the 8th of March produced a moderate scour, which aided the sinking; on the 17th the scour increased very rapidly on the south side, and the caisson began to tilt over; the next morning the water was found to be twenty-two feet deep there, while no corresponding wash had occurred on the north side. Under the combination of this undermining of the southern cutting edge, and the pressure of the sand against the north side, the caisson settled over till only the north-east corner remained above water. By hard work through the morning and dinner hour the machinery was removed and placed on boats. By 2 P. M. the whole caisson had disappeared; the weight of the sand and stone with which the walls were loaded, together with the external sand pressure, proved too great for so loose a structure; it broke in settling, and became a total wreck; a few of the timbers cleared themselves, and floated down stream, but the greater part of the wreck, being of green oak and covered with sand and stone, remained at the bottom of the river.

The loss of this caisson put an end to the work which had thus far been done on this foundation, making it necessary to start entirely anew. Moreover, the circumstances attending the wreck showed the exposure of this site to be so great that it was thought unwise to adhere to the plan of a pile foundation. The situation of this pier, between the edge of the sand bar and the low-water channel, exposes it to more frequent washes and deposits than have been observed elsewhere, while it is also liable to be subjected to the thrust of a heavy bank of sand on the north side, with no counterbalancing pressure on the south side, a danger from which the other piers are free. For these reasons it was determined to treat this as a channel foundation in preparing the new plan, and to extend the full-sized pier down to the rock. To avoid the difficulties of passing through the old wreck, which would have made it necessary to resort to the use of compressed air, and which it was feared would have delayed the completion of the bridge through another season, the location of the pier was