side, the country stretches away in low flat lands (covered beyond the river with closely-grown forest), which are partially submerged in seasons of flood; on the south, the course of the river is confined by steep high bluffs, upon which the city stands. At the present time seven different railroads pass through Kansas City: two lines from St. Louis, one on the north, a second on the south side of the Missouri; a line from Quincy, on the Mississippi; the Missouri Valley Railroad, from Kansas City northwards; a fifth line running southward through Kansas State; a sixth from Kansas City towards the north-west to the rival town of Leavenworth; and the Kansas Pacific Railroad running westward to Denver, near the Rocky Mountains, and forming one of the base lines of the future network in connexion with the Union Pacific Railway. In 1857, when Kansas City existed almost only in name, a State Charter was obtained for the construction of a line of some 1500 miles in length, to extend as far north as Lake Superior; by a provision in this charter, the projected company were authorised to bridge over any of the navigable streams within the State of Missouri. The Kansas City Bridge, however, of which we give an illustration on Plate LXVI., was constructed for the accommodation of a short line of fifty-two miles in length, which forms the Kansas City and Cameron branch of the Hannibal and St. Joseph Railway—the latter a direct line between the Mississippi and the Missouri. The rapidity with which railways have of late years been pushed forward to the west, has given an unexampled activity in the construction of long and large span bridges; and this structure across the Missouri is one of many other similar works in progress or completed.

One of the greatest difficulties which presented itself in the construction of the bridge, was the violence of the stream and the unreliability of its bed. Fierce high floods sweeping down over a muddy or sandy bottom, would not only shift the position of the navigable channel for several hundred yards in the course of a few months, but would destroy the banks themselves, changing the very topography of the stream, and undermining the trees with which its northern bank is clothed. All these effects of flood and current were well known by long experience and observation, but their full force was hardly realised until shortly after the commencement of the Kansas Bridge, when, within five days, the line of the south bank which, eastward of the city, falls from the high bluffs into the flats like those which characterise the other bank, was changed 500 ft., and a retaining wall, which protected the shore at a point a mile above the site of the bridge, was destroyed. It was, therefore, found necessary, not only for the security of the bridge, but also for the sake of the quays, wharves, and landing stages of the city, to revet the whole of the south shore from the ends of the high bluffs for a considerable distance eastward.

The bridge was commenced in January, 1867, and was completed at the beginning of July, 1869.

The total length of the work is 1387 ft. across the river, and 2360 ft. of trestle-work viaduct over the level on the north shore. The river bridge is divided into seven openings, and a narrow land span on the southern side 66 ft. wide, passing over the Missouri Pacific Railway. The first river span is 133 ft. in the clear, and rests upon pier No. 1. The draw span turning upon pier No. 2, and 362 ft. long, follows next; then a span 250 ft. in the clear, another of 290 ft., and two more of 200 ft. and 177 ft., respectively, which complete the crossing, the end of the last span resting upon a pier, and from which point the trestle-work before alluded to commences.

The first foundation commenced was that of pier No. 7, when a start was made on the 27th of February, 1867, immediately after the breaking up of the winter ice in the river. The soundings and examinations then made of the bottom of the Missouri were totally at variance with previous observations, and it was found that the floods had thrown up a high sandbank in the middle, opened a new channel near the northern bank, and excavated the channel on the south side to a considerably greater depth. In the formation of the foundation lay the only great difficulty of the engineer. The rock cropping out on the south side of the river, and rising in bluffs and precipitous rocks, disappeared beneath the bed with a rapid slope, until on the north side it was overlaid with loose and shifting sand to a depth of over 100 ft., and it was at a point where this depth of sand existed that pier No. 7 was located. By the 5th of April, 1867, an excavation had been made in the sand to the level of the low water, the sides of the opening were well strutted, and piles were driven down over the area enclosed, upon which it was intended to support the pier. The piles having been driven to a firm bearing, the sand was excavated to a depth of 5 ft. below the head of the piles, which were cut off to the level upon which the first course of the masonry was to be started. Just as this was in progress a heavy flood rolling down the Platte River from the Rocky Mountains swelled the Missouri so suddenly, that in a few hours the water level was raised 19 ft., filling the excavation with 14 ft. of sand over the heads of the piles which had been driven, and burrying the whole of the work. When the freshet subsided, it was found that the bed of the river had been scourcd out to a depth of 27 ft., and the contour of the bottom changed. This flood was the second of the three annual visitations to which the Missouri is subjected: the first arising from the breaking up of the ice of the Kansas River in February, the second in April from the Platte, and the