feet from the butts according to the length of the tree. The loose branches were placed among the tops, and interwoven with them. On top of this brush bank was placed a pile of stone 18-ft. in width, and 3 feet in depth, the rear line of the pile being placed 3 feet in from the line of the butts of the trees.

To hold the brush in position, while being built and sunk to bottom, stout piles were driven by a floating steam driver, generally to a depth of about 14 feet, and spiced at distances of about 10 feet.

Starting from a point on the Kansas shore, nearly opposite to the entre of the eity of St. Joseph, and running downwards, making an angle of about 40 degrees with the centre thread of the stream at high water this dyke was carried across the steamboat channel, the sand bar island, and the shallow channel beyond, and terminated on a sand bar with 2 feet of water on the cast side of this second channel.

The steamboat channel here is 550 ft. in width with a greatest depth of 20 ft. and current of a little less than four miles per hour.

Here a mole was built in the same manner as the dykes, to form a finish to the end of the dyke.

It was not considered advisable at this time to extend the dyke any farther, and it was determined to await the effect of the next flood, and mark the result.

The total length of this dyke is 2,100 feet.

During the building of this dyke across the steamboat channel, the area of the water way was steadily contracted ; and seour took place in proportion to this contraction. The bottom of the channel was, in this way, scoured to a depth of 25 feet below water. The eastern side of the channel was also scoured from the same cause, to such an extent that the greater part of the lower end of the sand bar island was cut away, as the head of the dyke approached.

About the time when this dyke had been built as far as the island, the change in the channel, previously mentioned as having been caused by dyke No. 3, took place, and at once relieved the pressure upon dyke No. 4, the flow through this channel being now almost stopped, by being turned, at the head of the Island, into the centre of the river.

In continuing the dyke across the second channel there was much less difficulty in placing the brush.

A few piles had been driven with intention of forming a temporary breakwater at No. 7: this now was rendered unnecessary, and work upon it was discontinued.

Work upon dyke No. 4 was completed Feb. 16, 1872.

No 5

The works of "protection" were also commenced, on the Kansas shore, at the same time as the work above described. These consisted of dykes Nos. 5 and 6.

No. 5 was merely a small dyke placed at a point 1300 feet above the bridge, to check scour which was found to be taking place at the time of commencement of No. 6.

No. 6, "Weavers Dyke" was commenced on the shore at a point about nine hundred feet above the bridge line; and built for a distance of some nine hundred (900) feet; running downwards and outwards, and striking the current at a more acute angle than in the case of dyke No. 4. The manner in which this dyke was constructed is exactly