

sion, which, originally emanating from the Yellowstone and the upper river, is from time to time deposited on the bars and again picked up, till it has finally been carried the whole length of the stream and left to form the bars and delta below New Orleans. Portions of the deposits remain undisturbed for centuries, forming the foundation of timber land and perhaps farms ; but many of them are of the most temporary nature, swept away and replaced several times in a season. The character of the deposit also varies materially with different floods ; sometimes it is almost entirely a clayey silt, while at others, especially if the flood be a violent one, it is largely composed of heavy sand. Below the silt and sand there is found a layer of coarse gravel and loose stones of varied geological character, and containing occasional relics of animal life. This gravel deposit is a collection of the coarser portions of the annual flood deposits, which, from its greater weight, having been moved but slowly by the current, has in time settled to the lowest limit of scour ; it is only found at considerable depths, and is almost entirely wanting in those parts of the stream where the bed rock is frequently swept bare.

The water is most nearly clear during the low water of the winter, and especially when the river is frozen ; it is muddiest during the summer flood, when a thickness of half an inch of water becomes a perfectly opaque screen. Such an amount of solid matter can only be kept suspended when in rapid motion, and is at once deposited wherever the current slackens ; hence it usually happens that, while the river is cutting away the bottom lands on one side around a bend, a sand bar is forming on the other ; and after the flood the channel will be found to have changed its position, while its width remains nearly the same as before. The very violence and power of the river thus confine it between narrow banks, and become the masks of its real size, quickly converting any slack-water into dry land, limiting the width to that actually required for the discharge, and depriving the Missouri of such large areas of calm still water as those which add so much to the beauty and apparent size of the Upper Mississippi. For the same reasons the "travelling sands" usually observable in rivers with sandy bottoms, and which have been described at length by writers on the Mississippi River, play a much less active part in the Missouri, as their existence demands a sufficient width of river to allow the