result should, properly speaking, be designated by a minus value); volume, 73.08 cub.m. in the second. This last datum shares of course in the error which attaches to the mean velocity. Two days later I was able to take a satisfactory series of observations, and I then ascertained that the correct result for the volume was 55.24 cub.m. in the second.

CHAPTER XIV.

BOLDSCHEMALS, THEIR FORMATION.

Before proceeding further I will advert to the morphology of the river-bed in this part of its course. Pl. 36 shows two stretches of the river, the one traversed on 28th May, the other on 2nd June. Each was covered by our ferry-boat in the space of one hour, and as it was kept as usual to the swiftest part of the current, the probability is that it passed over the deepest places in each section. The depth was sounded once every minute, so that each series of soundings indicates approximately the depths of the deepest trench along the river-bottom. I say approximately only, for an exhaustive map of the river-bed would require as many transverse lines of soundings as we have points along the river's direction of flow, and, in addition, soundings from several points along each transverse line. The two illustrations show distinctly, that the effects of erosion upon the bottom are most pronounced at the sharp bends, where a bottom eddy is created by the rapid turning movement of the water. This not only prevents sediment from being deposited there, but it actually digs deeper the river-bed itself. Where the river flows straight, the depth is relatively less accentuated.

The illustration of 28th May shows also what great efforts the river makes to cut off these bends or loops. It shows us a strongly marked loop, the neck or »stalk» of land at the base of which is eaten into every year deeper and deeper from both sides simultaneously, until ultimately it becomes so narrow that — unless the river meanwhile alters its course — it must inevitably be cut through, and the loop left on one side. Indeed, it is very likely that this neck of land would have been already severed, were it not for the interlacing network of roots which bind the dunes together, and so augment their power of resistance.

The subjoined series of illustrations depict seven different stages in the origination and disappearance of a bend or loop. Pl. 36 shows us what is the present aspect of the loop. The dividing line between the naked alluvia and the older alluvia which support vegetation indicates the direction in which the current has been at work in the immediately preceding period. With this to guide us, we arrive at the conclusion, that during a previous stage of its development the loop presented the appearance