

ments, and the result is scouring currents tending to drag the alluvial material down into the stream. The material so dragged down may become an obstruction which has subsequently to be dredged away. In special localities, where, owing to a sharp twist in the line of a river, erosion of the bank may be anticipated, it is sometimes permissible to run out an isolated jetty to accumulate material in a special spot, but, as a system, the groyning of a river frontage is one which may quite possibly do much harm, the effects of which for good are strictly local.

**"Shutting up" Breaches.**—This is one of the most troublesome and dangerous of operations, and requires constant watchfulness. One of the early records of this class of undertaking is that of Captain John Perry, published in 1721, and entitled *An Account of the Stopping of Daggenham Breach*. The record is not only of engineering interest, but also a human document. The expedients and pitfalls which the author describes are as much in evidence now as in his day, and the same futile methods of attempting to shut up a breach are still in vogue. The description commences with an account of the nature and extent of the breach, which was occasioned by the blowing up of a small drainage sluice or trunk. In consequence, the water found its way in and out of the levels until the gapway became scoured down to the moorlogg and gravel. Parliament was appealed to on account of the impediment the breach occasioned to the navigation of the river, and for fourteen years the breach had gone from bad to worse. The strong current of the efflux from the drowned marshes was felt for miles up and down the river. Many attempts had been made by sinking ships in the breach, pouring in bags of earth, ballast, and chalk, but the only effect of these attempts was to widen and deepen the torrent of water flowing in and out. Captain Perry describes with humour the episode of a large specially-constructed chest, 80 feet long, having been loaded with stones and sunk in the gapway, and, on the following day, this being seen floating down the river. In 1714 an Act was passed ordering the stoppage of the breach at the cost of the State. The Corporation of London advertised for proposals to carry out the work. The sum at which Captain Perry then