ART. LIII.—*Direct Evidence of a Change in the Elevation of the Waikato District.*

By ASHLEY HUNTER, C.E.

[*Read before the Auckland Institute, 12th November,* 1883.]

IN December, 1875, a paper entitled "Observations on the Evidence of recent Change of Elevation of the Waikato District," was read before this Institute by Mr. James Stewart. In it the author endeavoured to show by certain evidence that the Waikato District had at one time a considerably greater elevation than it has at present. The following additional evidence as bearing on the subject and going to prove most conclusively that such has been the case may prove interesting:—

In designing the present railway bridge at Hamilton it was originally estimated that the cast-iron cylinders would reach a solid foundation at a depth not greater than 40 feet below the present surface-bed of the river; subsequent events, however, proved that this was far from being the case. The cylinders were sunk by the pneumatic process, and excavated by manual labour under air-pressure until a depth of about 60 feet was reached, and the air pressure of 32lbs. per square inch being more than the men could stand, dredging was resorted to.

The excavation throughout the cylinder sinking showed nothing but layers of pumice and quartz sand until the excavations were carried to their present depths, when it was shown by the dredge bringing up large lumps of hard coarse greensand that the formation of the old river-bed had been struck.

The western pair of cylinders were sunk to a depth of 80 feet, and the eastern pair of cylinders to a depth of 55 feet below the present bed of the river. The fact of the eastern cylinders resting upon the same formation as the western cylinders, but at a level 25 feet higher than the latter, proved that they were resting not upon the old river-bed but upon the eastern bank of the old river-bed. This is important as showing that the old river must have had a very high velocity to have scoured out a channel more than 25 feet deep through such a hard formation. Reducing the railway levels to high-water mark at Auckland, we find that the formation level of the Hamilton Bridge, which is practically the level of the surrounding district for some miles, is 126 feet above high-water at Auckland, while the level of the old bed of the river is 51 feet below high-water at the same place. If we assume that in olden times the general inclination of the river from this point towards the sea was the same as now, viz., about 9 inches to the mile, then the minimum change of elevation which we can certainly assign to this portion of the Waikato District at least is about 80 feet.

It is also, perhaps, worthy of note that the Waikato River, just above Cambridge, is at the present time flowing on its oldest and lowest bed of rock, whereas at Hamilton it is at present flowing on a bed 80 feet above its lowest bed, and supposing these two portions of the district to have maintained the same relative levels one to the other, then, looking at what would have been the difference of level of the old river-bed at these two points, there is tolerably conclusive evidence that the river between Cambridge and Hamilton must at one time have had all the velocity of a mountain torrent. As the country lowered relatively to sea-level the river would loose in velocity, and so the large quantities of sand which it held in suspense would be gradually deposited as shown at Hamilton.