street, 300 yards below the American Fall. The end resting on the left bank, lands upon the main road running along the bank of the river, and is 100 yards below the Clifton House, and about three-quarters of a mile below the great Horse Shoe Fall on the Canada side.

The magnetic bearing of the bridge is south 46°, east, or very nearly south-east and north-west. It crosses the river at right angles to its general direction at this point. A section of the river on the line of the bridge gives a distance of 1190 ft. from rock to rock at the top cliff, and 850 ft. at the water's surface. The rock on the left bank is 175 ft. above the water, and on the right bank 180 ft. The American Fall is 164 ft. On the Canada side the rock is covered with 2 ft. of earth. It falls off perpendicularly 54 ft. to the debris which covers the fort and slopes away to the water's edge. On the American side it is covered with 20 ft. of drift (clay, sand, and gravel), which, when removed to make room for the towers, exposed a water-worn surface. Here the rock overhangs 10 ft., and the plumb line strikes the top of the debris at a distance of 80 ft. from the surface.

Immediately beneath the bridge the river is 280 ft. deep, and the current flows at the rate of four to five miles an hour. Its surface is mottled with the foam from the Falls, and rippled by the eddies which indicate its depth and power.

From the surface of the rock at the top of the cliff the ground rises 80 ft. to the level of the table land, and attains that elevation at a distance of a quarter of a mile from the river, on either side, showing that before the river had excavated its channel through its rocky bed, it flowed in a valley of more than four times its present width.

General Dimensions.—The span between the points of suspension, or centres of towers, is 1268 ft. 4 in. The deflection of the cables at centre, or greatest depression below the horizontal line, varies from 80 ft. in winter to 92 ft. in summer. The difference of 3 ft. is owing to the effect produced upon them by the changes of temperature, ranging through 100° Fahr. The roadway is suspended at an elevation of 183 ft. above the water on the Canada side, and 188 ft. on the New York side, while the centre, according to the season, varies from 190 to 193 ft., there being a rise of 4 ft. in the curvature of the bridge in summer, and 7 ft. in winter. The tops of the towers being in the same horizontal plane, are therefore 105 ft. high on the left bank, and 100 ft. high on the right bank. The length of the cables at medium temperature is 1286 ft. between centres of towers; 1828 ft. between the anchor pins, where they are connected with the anchor chains, and 1888 ft. in all, between the anchors embedded in masonry on either side. The prolongation of the cables under ground is effected by anchor chains of Lowmoo iron 30 ft. in length, made in links of 19 ft. each, firmly built in hydraulic masonry.

Anchorages.—The anchors are of cast-iron, 3 ft. 6 in. by 5 ft., weighing upwards of a ton each, pierced for the reception of the anchor bars, and having deep flanges on the back, against which the anchor bars are secured by steel pins. They are placed 17 ft. below the surface of the ground. On the Canada side they are embedded in the solid limestone rock, which is horizontally stratified, and reaches up to within 1 ft. of the ground surface.

A channel was cut through this rock just large enough to receive the anchor chains, and at the extremity or lower end of this channel, a chamber was excavated for the anchors, and the jambs or shoulders against which they are fitted were accurately cut out of the native rock, in a plane at right angles with the direction of the anchor chains. The sides and lower edges of the anchors have thus a firm and even bearing against a stratum of rock 6 ft. in thickness, and the top bears against a large keystone placed over the chains, which, as it were, locks and bars the chamber door. The whole is built in with masonry set in hydraulic cement, and carefully grafted so as to perfectly fill all cavities.

On the New York side the anchors are similarly set in a mass of solid masonry laid in hydraulic cement, the course of the chains being lined throughout with heavy cut ashlar set in cement, and laid in such a manner as to form a solid floor and cover for the chains.

The body of masonry in both anchorages below the ground line on the New York side contains 530 cubic yards, and including the two pedestals built above ground (each of which is 30 ft. long, 7 ft. wide, and 7 ft. high), enclosing the ends of the cables, the anchorages on this side contain 630 cubic yards of masonry, the weight of which is 1415 tons of 2000 lb. But before the inertia of this mass can be disturbed, an equal bulk of sand and gravel surrounding it would have to be moved, and the total resistance opposed to the direct strain of the cables is not less than 2400 tons. On the Canada side, the anchors having a firm hold of the solid rock, the resistance is inestimably greater.

The weight of the bridge and its greatest load (363 tons) produce a maximum strain of 705 tons upon the cables and stays, but one-tenth of this strain is thrown down vertically upon the bearing stones where the cables enter the ground, by virtue of the change of direction at that point. Hence the greatest pull upon the anchors cannot exceed 63½ tons, and as this strain scarcely exceeds one-fourth of the dead weight, or total resistance opposed to it, it is apparent that the