

TERRACES OF NORWAY.

SIR,—I much regret that Col. Greenwood hit upon the wrong Aardal. That which I referred to is at the east end of the Sogne Fjord. Steamers make the trip, and, once a fortnight, also call at Fjærland, within an hour's stroll of a glacier remanié, the Suphelle Bræ, which descends to certainly not more than 150 feet above the sea level. A valley to the north contains capital terrace examples, and is closed by the great glacier of Boium's Bræ. From Bergen to the Sogne Fjord, to Fjærland, and to Aardal, the Mørk Foss, back to Gudvangen, across to the Hardanger Fjord, up the Sør Fjord to Odde, thence across the Folge Fond by an easy glacier pass to Bondhus, and westward to Stavanger, would be a fortnight's deliberate trip, and afford sublime scenery, with geology enough for a glutton, besides numerous lateral excursions, should the traveller have time. He must study the times of the steamers well in laying his plans.

I am sorry Col. Greenwood did not accept my invitation to intending explorers to ask me any questions.

MARSHALL HALL.

YACHT NORNA, Sept. 19, 1871.

RIVER TERRACES.

SIR,—In the two letters on this subject which you have done me the honour to publish in your numbers for April and September, I have contended that *inland* river terraces are very simple effects of rain on rivers; that they are the remains of alluviums formed on land by the overflow of rivers; and in the report of Mr. Chief Justice Begbie's account of the "Benches of British Columbia" in the Proceedings of the Royal Geographical Society for July, the Chief Justice remarks (page 138) that the rise of the Fraser river in flood at Lilloet is 40 feet; at Fort Alexandria 25 feet. Here, then, must be two alluviums forming on land at the present day below the old terraces. Gorges, by checking the rain-floods of the river, cause these enormous rises. When, however, the beds of these gorges are deepened by erosion, the river, unable to overflow the alluvial banks which it has built up, will, in floods, tear them down and will drive them to the hill-side as two parallel terraces.

The prevalent opinion, however, in the discussion of the paper was that the terraces have been formed at the water level of lakes by materials washed down by the river, and not on land alluviums. A "bursting of the barrier" is then supposed, and "a sudden drainage" of the lake to the level of the succeeding terraces. And so a succession of "bursting of barriers" and a succession of "sudden drainages," one of each of these for each pair of terraces. Each barrier which it is required to "burst" being perhaps a gorge of the hardest possible rock, and extending for any number of miles. But to form two parallel terraces the river must have filled the lake entirely with the materials carried down. In this case there could be no "sudden drainage" of a lake which had no water in it. Or are we to suppose that in former times all rivers on entering the lakes bifurcated and deposited their materials as terraces at the level of the water on the two opposite side-shores of the lakes, leaving the