glaciers, have fallen into the gorge and apparently prevented further water erosion. The effect is most difficult to describe—these cataracts and gorges must be seen to be realized; no photograph does them justice.

The Twain River enters Cassell's Flat through a truly magnificent gorge. The south bank rises nearly sheer—that is, precipice after precipice—with ledges here and there for some 3,000 ft. straight out of the water. In places overhanging rocks seem to be ready to topple forward as one climbs along beneath them, at one point the cliff leans forward to such an extent that I estimated a stone would fall nearly 1,000 ft. without touching the cliff. The north side slopes back at an angle of 40 degrees, and is clothed with luxuriant rata forest. Through the gorge the river descends some 500 ft. in about a quarter of a mile over boulders up to and probably over 40 ft. in diameter, forming a wonderful cataract. I envy the man who happens to see this in a flood from close quarters; it looks stupendous from a distance.

The gorge at the head of Cassell's Flat, through which the main branch flows, is quite different, but in its way is almost as impressive. The stream descends about 1,100 ft. in a mile and a quarter over two great cataracts, the upper one, I should estimate, is 400 ft. to 500 ft., and our party in December, 1928, are the only people to have seen this at close quarters. The whole of this large river plunges over a practically perpendicular drop and is dashed into a white welter of foam as it is broken upon the huge boulders (some must be 80 ft. in diameter) which have been jambed together in hopeless confusion in the rock-walled gorge. It then runs deep, with an oily smoothness, into a black, narrow canyon preparatory to its leap over the lower cataract, which no one has seen closely, but which I saw in 1894 from a distance. To reach the upper valley above this gorge necessitates an intricate high-level route amongst a somewhat complicated series of rocky bluffs and thick bush.

Above the cataracts the valley opens out (see Fig. 2) and has on the south bank a steep rocky terrace of hard gneiss rock, some 300 ft. high, over which the tributary streams drop in fantastic waterfalls (see Fig. 3). This terrace becomes lower as the floor of the valley rises, until, two miles up, it "peters out" in a fantastic gorge, with smooth rock sides of some 40 ft. high, which approach within a few feet of one another in places. I named this the "Dovetail" Gorge, because it looks as if it had been roughly sawn out in zig-zag pattern and the two sides pulled slightly apart.

The water is very deep here and drops into the upper end of the defile over a fine fall of some 20 ft. On my latest journey down the river in 1928 I found that, for the upper quarter of a mile, the north side had fallen forward on to the south wall and completely hidden the river, which could be heard roaring amongst the huge blocks of rock far below and out of sight. The lower half, however, is still intact. Above this is a second small flat, which I named "Lame Duck," above which the valley alternates heavy-boulder work with short gorges. At one place the two sides, 20 yards wide at the water's edge, approach to within 6 ft. of each other 40 ft. above, while 3 chains farther up the valley the two sides actually touch from below the water to 15 ft. above. Here the river is sucked down in a whirlpool and bursts up seething and bubbling below the obstacle.

More large boulders, and then the Troyte River comes in from the south through an imposing and gloomy gorge between towering mountains. This drains the small ice-fields of Fettes Peak. After passing the Troyte, about one mile and a half of bad boulders, taking a good three hours to negotiate brings one to a small flat at the head of the river which I named "Christmas Flat"—for on that day I reached it with a light camp, by myself, in 1894. The flat is 2,803 ft. above sea-level, dominated by bleak rock peaks and lying immediately under the Karangarua Saddle (5,600 ft.), from which a wonderful view is obtainable down the Karangarua to the west, the Landsborough Valley with the peaks of the Divide to the south-west, while eastward the fine McKerrow Glacier sweeps down from Mount Isabel and curves past, 300 ft. or so immediately below one's feet, and to the north-east Mount Sefton towers up over Douglas Pass, which leads from the McKerrow Glacier into the head of the Twain River. I have been up many rivers on the coast, but I do not think any of them equal the Karangarua main branch for beauty, variety, and grandeur. It is not unduly difficult, but might lead a party into endless trouble if attempted without directions from some one of the very few people who have penetrated these solitudes. Dr. Cockayne has already commented on the interesting discovery I made in 1894 of the 1,000 acres of beech forest which is found, above the great gorge, intruding on the rata forest, and in view of his hesitancy in accounting for this I would not venture an opinion, but can only hope that a competent botanical authority will some day find time to make a personal examination on the spot.

The Twain River.—Unfortunately, I was for some weeks alone at the end of 1894, and had to tackle the Twain Gorge under a disadvantage. I found it impassable for one man, at any rate; it is probable that a party with ropes could pass through this defile on the south bank, but the north side is impracticable under any conditions. I ultimately reached the head of the branch via the Karangarua Saddle, McKerrow Glacier, and Douglas Pass, and followed the river down to the upper entrance of the gorge.

The whole character of the Twain Valley is a great contrast to the Karangarua, the latter is full of beauty combined with grandeur, while the Twain is harsh and cruel looking, but at the same time extraordinarily fine. Above the cataracts the valley extends some seven miles up to the Douglas Glacier, and, for the whole distance on its south side, is walled in by rocky precipices descending from terrace to terrace for 2,000 ft. and even 3,000 ft. These fearsome cliffs are practically bare rock, and in places are so sheer that they might have been rough hewn by human hands for hundreds of feet. Here and there they are separated from the river by more gentle slopes of scrub-covered debris which lie at their base—the north side, clothed with stunted scrub merging into bare snow-grass, rises at an angle of 30 degrees to the snow summits of the Karangarua Range. At the bottom of the valley the river has, in one or two places, cut deep narrow gorges, one of which I estimated to be 200 ft. deep and very few feet across at the top.