

line will contour Hutchison's Range, up the east side of the Burke, across Mueller's Pass, and thence down Princess Creek and the north side of the Okuru, across it, and on to Jackson's Bay along the foot of the coast ranges. From the Haast Pass, 1,847ft. high, to Mueller's Pass, 1,820ft. high, the line will practically run on a level, and, with the exception of the first three miles near Haast Pass, where the country is rather broken by several small but deep-cutting creeks, the sideling is gentle, of good standing ground, and absolutely safe from slides, slips, or avalanches. From Mueller's Pass the line keeps along the southern slopes of Mounts Victor and Neger Ranges, with a fall of 1 in 50, which will land it at Okuru River crossing where indicated on the map, at a place most suitable for bridging the river. From thence the route is perfectly easy and practically level to Jackson's Bay, crossing the Turnbull, Waitoto, and Arawata at good places for bridging, especially at the Arawata, where, at the spot indicated, both banks are solid rock, with a rocky islet, as if placed there for bridge-abutment purposes, in the centre of the river. The length of the route marked out by Mr. Clarke from Haast Pass to the Okuru River crossing is 45 miles; the length of the one from the Haast Pass to the Okuru River crossing recommended by myself is 28 miles, or 17 miles less than the other. Allowing for the construction of these 17 miles only an average of £6,000 per mile, a saving of £102,000 would be effected by the adoption of my route. But there is this in addition: that by the Haast Valley route the Burke River will have to be bridged, two to three miles of steep rock-faces and five bad bluffs will have to be passed, and some of the latter probably by driving tunnels through them; whereas along my proposed route there are no such difficulties. The route I have sketched out will of course not be free from rock-work, which will probably be heavier than I expect, but there is certainly not one-fourth of the rock-work plainly apparent on the surface of the country that there is on the Haast Valley route.

I have now only to add a few remarks in regard to the geological formation of the country which I explored. In the Okuru Valley, from the railway-crossing to the Actor junction, the formation is gneiss—strike, N.E.; dip, 60° E.: two miles below Franklin's Creek the high cliffs are entirely composed of it. One mile up the Actor, on the Mount Glissa side, the gneiss formation merges into mica-schist—strike, N.E.; dip, 70° southerly. At the head of the Actor River several quartz reefs (one of them jet-black quartz) crop out, which are running north and south, cutting the line of strike and dip, and with hanging-walls, soft casing, &c. The formation these reefs are enclosed in is a species of very close-grained green schist. At a point half-way between upper camp, Okuru, and the Maori Saddle the rock is contorted schist—strike, N.; dip, 50° E. In the Okuru River-bed, from about a mile below the Actor junction to above Princess Creek, there are to be found boulders of granite, green slate, and porphyry, mixed with quartz and serpentine. Where they come from I cannot say, not having come across these rocks *in situ*. At point D and point E, in Burke River Valley, the formation is also schist rock—strike N.E., dip 50° E., at point D; and strike N.N.E., dip 60° E., at point E. The river at point E is full of schist and blue, flinty, laminated quartz. At point H, at Strachan's Creek, down the Burke to junction with the Haast and up to the Wills River, the schist formation continues, and from thence up the Haast Pass Road the Torlesse slates come in.

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