

The tables prepared by the engineering staff, showing the changes in the width of the crack, the amounts of the tilts, and the discharges from leaks, clearly indicate the effect of the alteration of the depth of water in the forebay. Undoubtedly once the crack was formed the hydrostatic head in it was the main factor in determining the amounts of these. But until this crack formed the small amount of water (if any) that percolated from the headrace into the rock did not, in our opinion, exert an effective hydrostatic pressure.

Earthquake Tremors.—Earthquake tremors cause deforming movements in rock-masses, and produce landslides and fractures in solid rocks. Several people at Arapuni now say that they felt an earth-tremor sometime after midnight on the 7th June; but as this slight earthquake was not felt in the surrounding district it is probable that the opening of the crack caused the earthquake, and was not caused by it.

POSSIBILITY OF RECURRENCE OF MOVEMENT.

Once the crack opened the hydrostatic pressure of water in it undoubtedly was the principal cause of the widening of the fracture and the concurrent increase in tilt of the moved block. The evidence does not clearly show that the purely geological factors, as detailed above, were important in causing the crack. Possibly they were sufficient, in combination with the definitely known engineering stresses, to rupture the rock, already weakened by the erosion of the channel forming the headrace and by the engineering excavations. The cause of the fracture must be definitely ascertained so that remedial measures may be taken. We suggest that the strata beneath the powerhouse be explored to a depth of 100 ft. or more by shafts or by bores of large-enough diameter to yield a continuous core, and that the different rock-layers be geologically examined and tested for their strength and elastic properties.

J. HENDERSON.

P. MARSHALL.

J. A. BARTRUM.

Approximate Cost of Paper.—Preparation, not given; printing (550 copies), £3 15s.

By Authority: W. A. G. SKINNER, Government Printer, Wellington.—1930.

Price 3d.]