

The Clinton-Tuapeka Series Boundary.

By C. OSBORNE HUTTON,

Petrologist, New Zealand Geological Survey.

[*Read before the Wellington Branch, July 12, 1945; received by the Editor, July 13, 1945; issued separately, December, 1945.*]

During a field examination* of the conglomerates of the Clinton Series in South Otago, the writer noted a number of points that may throw some light on the obscure relation between the Clinton and the Tuapeka Series as mapped by Ongley (1939) in the Kaitangata-Green Island Subdivision.

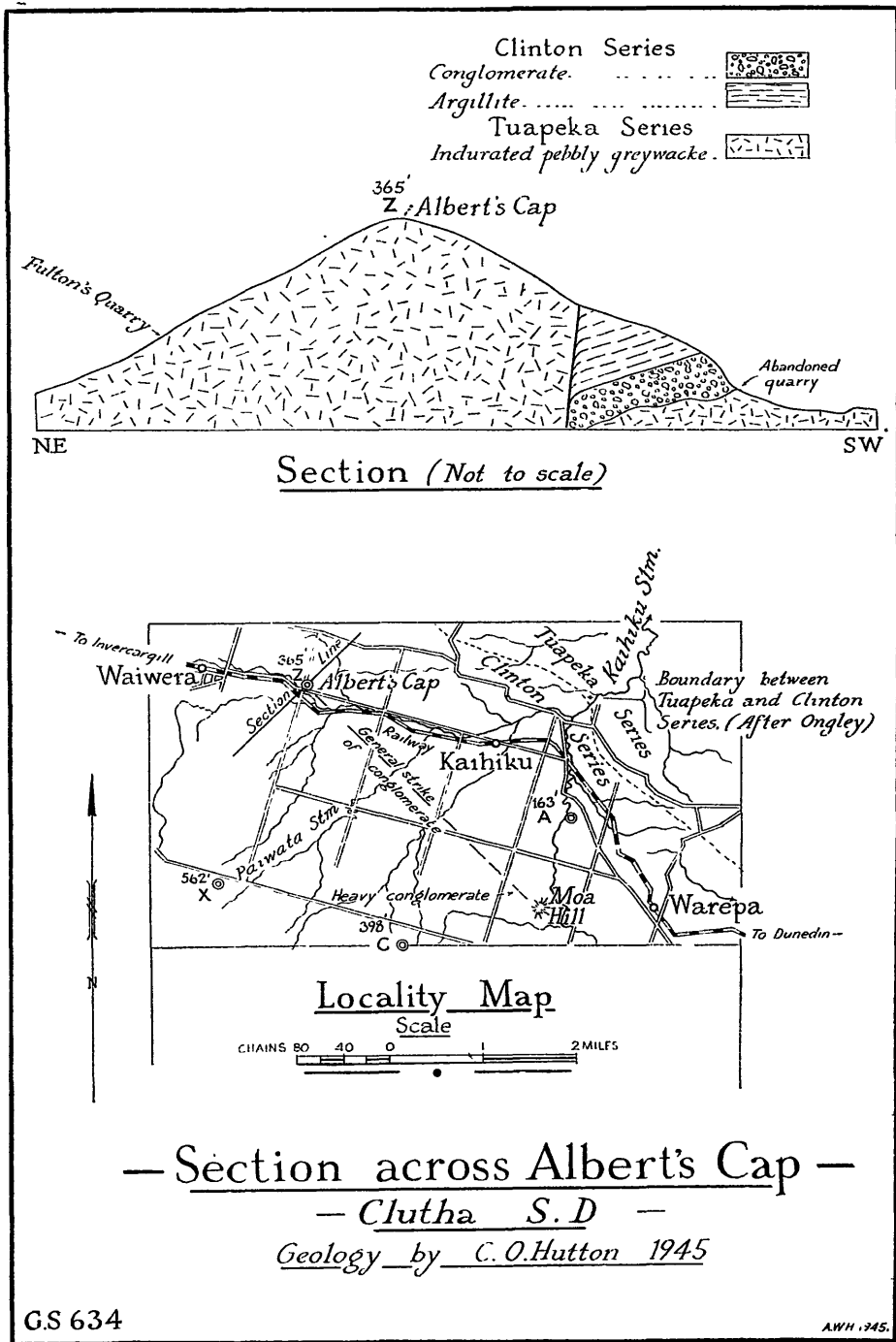
Without giving particular evidence, Ongley has drawn the boundary between the Clinton and Tuapeka Series at a point on the Kaihiku Stream one mile north-east of Kaihiku Railway Station, and at this locality the writer noted grey and black argillites, together with heavy bands of conglomerates, overlying the well indurated pebbly greywacke of the Tuapeka Series; the actual contact, however, was not visible. At Albert's Cap, a prominence rising about 150 feet above the surrounding plain, and a mile east of Waiwera township, the same sequence of argillites and conglomerates can be seen, but here in the disused quarry on the south-west side of the hill they have been observed resting on a smooth but eroded surface of an indurated pebbly greywacke; this greywacke is very similar to that which makes up the main mass of Albert's Cap. The conglomerates and argillites strike approximately 150° , and dip 50° to the north-east. Further, in an abandoned quarry 200 yards north-west of the previous location, these beds are bent nearly vertical by a fault of considerable throw which has brought them into juxtaposition with the hard, pebbly greywacke; this zone of movement appears to be oriented parallel to the strike of the conglomerates themselves—that is, at approximately 150° .

The importance of the unconformity below the conglomerates must not be overlooked, but its interpretation is not clear. In the writer's opinion there are two possibilities:—

- (1) If the boundary as mapped by Ongley is correct, then the unconformity at Albert's Cap represents a major break well within the Clinton Series; or
- (2) The unconformity represents the actual contact between the Clinton Series and the underlying Tuapeka rocks.

Now during his survey of this area, Ongley (1939, pp. 32-33) noted that though on one hand the greywackes of the Clinton group of rocks and the Tuapeka Series are often indistinguishable, still on the other, certain criteria were found to be useful for differentiating them. Whereas the Tuapeka greywackes are dense, fine-grained, and somewhat indurated, the Clinton rocks, apart from conglomerate

* March 7, 1940.



bands, are coarse greywackes, often greenish in colour, with distinct red spots, and where moved, they are often polished along red slickensides. The pebbly greywacke at Albert's Cap is a hard, massive rock that fractures across the pebbles when broken, and lacks the red spots so common in rocks of the Clinton group; hence the characteristics of this greywacke are more like those of the Tuapeka Series than of the Clinton rocks.

Therefore it is inferred that the pebbly greywacke should be included with the Tuapeka Series, and in that case the greywacke in Fulton's Quarry, on the north side of the hill, will be the lowest bed in the sequence; the faulting has thus brought the stratigraphically higher argillites and conglomerates down against this greywacke, the underlying Tuapeka Series being just visible in the disused quarry on the south-west side of Albert's Cap. The actual contact between the Clinton Series and the Tuapeka rocks appears to be represented by the unconformity.

REFERENCE.

- ONGLEY, M., 1939. The Geology of the Kaitangata-Green Island Subdivision, Eastern and Central Otago Divisions. *N.Z. Geol. Surv. Bull.*, no. 39.