



## Letter to the editor: East Cape structures

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## LETTER TO THE EDITOR

## EAST CAPE STRUCTURES

Sir,

Dr M. F. Ridd (1968) describes Mr R. Stoneley's work in the East Cape area (1968) as a 'valuable step in the unravelling of the geology of this complex part of New Zealand'. There is no doubt as to the correctness of this statement and that gravity sliding has probably been important in at least pre-Southland times. There is also little doubt that some of the pre-Southland sediments are extremely mobile under stress (cf. Stoneley, 1962), but it does not necessarily follow that structures involving Southland to Taranaki beds have developed from "floating" upon a plastic substratum (Ridd, 1968, p. 547). It is the 90° change in strike between structures involving beds of pre-Southland age and those involving beds of Southland-Taranaki age that is of particular interest and for which I believe there could be an alternative origin.

For a true perspective, these structures must be viewed within a frame of reference much larger than the East Cape Region where the north-east striking Late Tertiary structures are but the north-east extension of similar structures found along the whole of the East Coast of the North Island (Kingma, 1962, 1967). Similarly, the structures of the pre-Southland sediments, which strike northwards in the Urewera National Park west of Gisborne (Healy *et al.*, 1964) and which swing to a north-west strike north of Gisborne (Stoneley, 1968; Kingma, 1965), tend to be parallel to the trends of the Auckland Arc west of the Taupo-White Island Volcanic Zone. These pre-Southland structures are perhaps to some extent complicated by doming but are those to be expected (*see* Schofield, 1960) if the Alpine Fault up to this stage had not been active north-eastwards of the Auckland Arc (Fig. 1a). By Late Tertiary time, however, activity of the Alpine Fault or Megashear was sufficiently extended to the north-east to bring about the change in fold directions of the East Cape Region (Fig. 1b) and, in my view, occupied a sub-crustal position below the Taupo-White Island Volcanic Zone, this being the most direct continuation of the Alpine Fault from the South Island. It is probably no coincidence that the timing of both the following activities is about the same: the change to north-east trending structures of the East Cape Region that involve beds of Southland and Taranaki age; and the commencement of activity in the Taupo-White Island Volcanic Zone that was not active until post Early Pliocene times (Fleming and Steiner, 1951).

19 July 1968.

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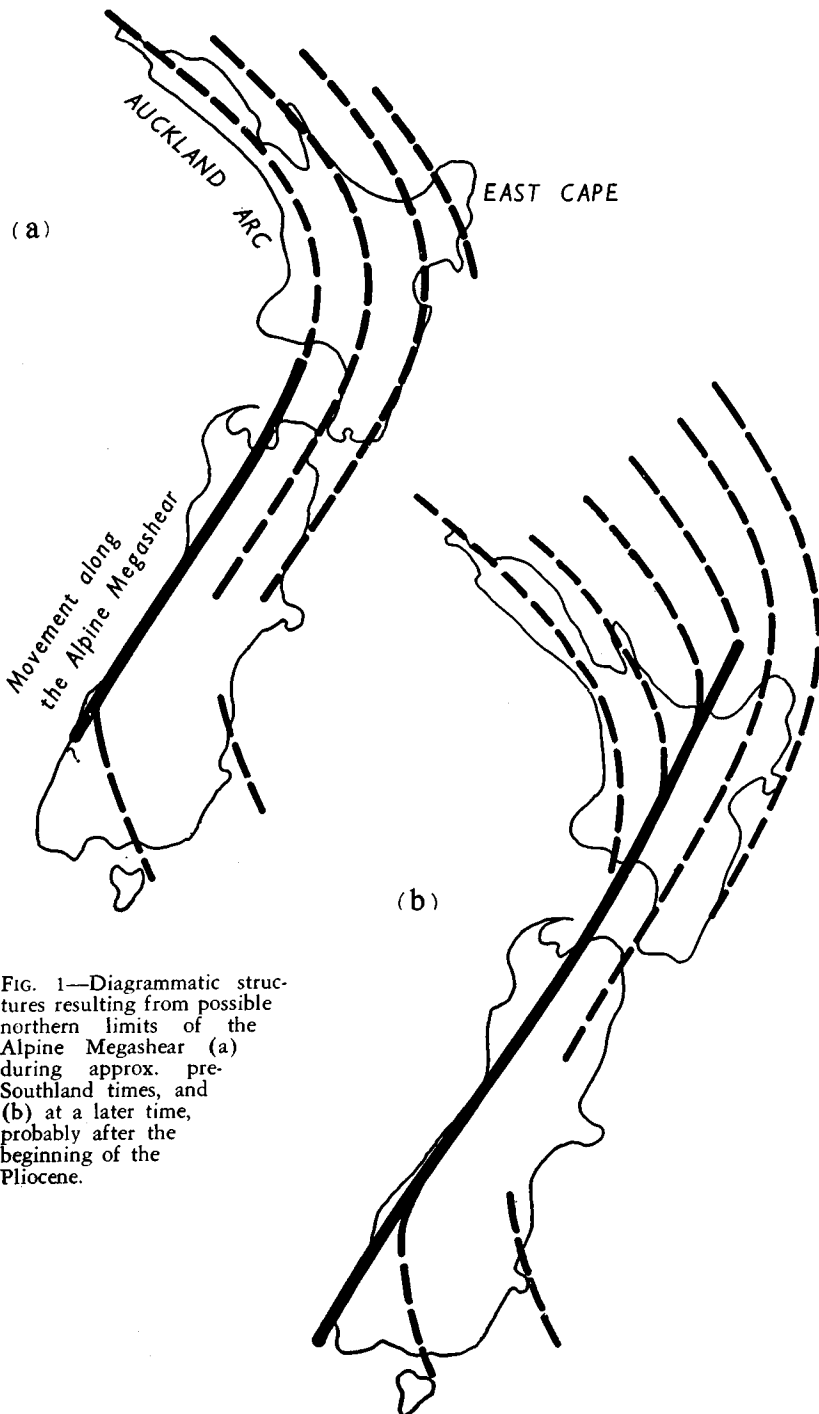


FIG. 1.—Diagrammatic structures resulting from possible northern limits of the Alpine Megashear (a) during approx. pre-Southland times, and (b) at a later time, probably after the beginning of the Pliocene.

- FLEMING, C. A.; STEINER, A. 1951: Sediments beneath Ruapehu Volcano. *N.Z. J/ Sci. Technol.* 32B (6): 31-2.
- HEALY, J.; SCHOFIELD, J. C.; THOMPSON, B. N. 1964: Sheet 5—Rotorua (1st ed.) "Geological Map of New Zealand 1:250,000." New Zealand Department of Scientific and Industrial Research, Wellington.
- KINGMA, J. T. 1962: Sheet 11—Dannevirke (1st ed.). *Ibid.*  
——— 1965: Sheet 6—East Cape (1st ed.). *Ibid.*  
——— 1967: Sheet 12—Wellington (1st ed.). *Ibid.*
- RIDD, M. F. 1968: Gravity gliding on the Raukumara Peninsula (Letter). *N.Z. J/ Geol. Geophys.* 11 (2): 547-8.
- SCHOFIELD, J. C. 1960: Some theoretical structures associated with transcurrent faulting applied to the Alpine Fault. *Ibid.* 3 (3): 541-6.
- STONELEY, R. 1962: Marl diapirism near Gisborne, New Zealand. *Ibid.* 5 (4): 630-41.  
——— 1968: A Lower Tertiary décollement on the East Coast, North Island, New Zealand. *Ibid.* 11 (1): 128-56.

### CORRIGENDUM

Vol. 11, No. 5, (December 1968)

SWINDALE, L. D. and HUGHES, I. R.: Hydrothermal Association of Pyrophyllite, Kaolinite, Diaspore, Dickite, and Quartz in the Coromandel Area, New Zealand.

p. 1179, line 18. "occur below . . . 380°C is" Delete this line (but not where it is repeated on line 21) and substitute "humidity for use. The small kaolinite endotherm at 500°-600°C is".

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