



# A recent, possibly catastrophic burial in a marine molluscan community

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## NOTE

**A RECENT, POSSIBLY CATASTROPHIC BURIAL  
IN A MARINE MOLLUSCAN COMMUNITY**

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## SUMMARY

A shallow water benthic sample from off the east coast of the Coromandel Peninsula contained compact shelly sand overlain by mud. The fauna, confined to the sand layer, consisted of infaunal bivalves dominated by *Tawera spissa* (Deshayes). The presence of dead or decaying bivalves only, indicates a heavy mortality in the community attributed to burial by the mud layer.

## INTRODUCTION

A benthic sample collected near Kennedy Bay on the east coast of the Coromandel Peninsula (N.Z. Oceanographic Institute Sta. C 791, 23.2.62, 36° 40' S, 175° 35.1' E, 22 m) showed two distinct sediment layers when examined on board ship. Uppermost was a layer of semi-fluid brown mud with grey-black streaks and lacking any obvious life, and underneath it a layer of compact sand with a rich bivalve fauna dominated by *Tawera spissa* (Deshayes), with *Nucula nitidula* A. Adams, *Dosinia subrosea* (Gray), *Scalpomactra scalpellum* (Reeve), and fragments of *Longimactra elongata* (Quoy and Gaimard) also present. Most species were represented by single valves, some with portions of the ligament present, but several intact specimens of *Tawera* were widely opened and contained decaying soft parts. Grain size analyses showed that the mud layer was composed entirely of particles less than 0.066 mm in diameter. The sand layer contained only 2% (by weight) of particles of this size and nearly 70% of particles 1–0.25 mm in diameter, as well as coarser material.

## DISCUSSION

Similar living faunas have been described by Grace (1966) from Whangateau Harbour and Powell (1936) from Omaha Bay and off

Tauranga. An examination of some New Zealand Oceanographic Institute samples shows that this fauna is quite common in shallow coastal northern localities. It is characterised by the numerical dominance of *Tawera spissa* (Deshayes). Other species which may be present are *Nucula nitidula* A. Adams, *Glycymeris laticostata* (Quoy and Gaimard), *G. modesta* (Angas), *Venericardia purpurata* (Deshayes), *Dosinia maoriana* (Oliver), *D. subrosea* (Gray), *Scalpomactra scalpellum* (Reeve), *Maorimactra ordinaria* (Smith), and *Longimactra elongata* (Quoy and Gaimard). All important species are suspension feeders and all records are from sandy substrates.

The absence of live bivalves and the presence of dead and decaying specimens in the present material is attributed to burial by the mud, either in a single engulfment or by slower burial.

The mud layer is assumed to result from terrestrial runoff following heavy rainfall. Sediment carried by this runoff could be transported directly off shore or through Kennedy Bay, just to the south. In the sampling locality water movements were insufficient to prevent deposition which, moreover, may have been assisted by chemical changes in the sediment and by mixing of the runoff with sea water.

The echo sounding record taken at the time of sampling reveals no basins in which fine sediments might be trapped. The coastline in this locality is fairly steep and rugged, and Kennedy Bay is a small shallow harbour with a small flat hinterland backed by steeply rising hills with peaks of over 1,000 ft above mean sea level. Whangapoua Harbour, to the south of Kennedy Bay, is similar though larger. Meteorological records for 1962 (N.Z. Met. Service 1964) show that at the nearest recording station, Whangapoua Forest, approximately 4 miles south of the sampling position, the heaviest rainfall immediately preceding the date of sampling was on 30 January. Other recording stations on the Coromandel Peninsula area recorded heavy rainfall on 28 or 29 January. If the mud layer in the sample is correlated with this rainfall, it could have been present in the sampling locality for approximately 24 days before the sample was taken.

The rate of deposition of the mud would be dependent on the size and shape of the particles, the water temperatures, the relative densities of the mud and water, on local water movements, and also on whether the mud was transported at the top, throughout, or at the bottom of the water column.

Mortalities of the benthic fauna of this nature have apparently been rarely observed and Brongersma-Sanders (1957) lists no similar occurrence, although Engle (1948) has described damage to American oyster reefs by sediment transported during a hurricane. Intense rainfall, with over 10 in. recorded in one day, has been reported from Milford Sound (Hurley 1965, p. 86) and sediment was present in the surface waters 3 days later (Pantin 1965, p. 44). However, in the Milford environment the incoming sediment was of the same size range as that on which the benthic fauna was already established and would not appear likely to be a lethal factor in enclosed fiords of this type.

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