Thin conglomerate beds are found interbedded with the finer rocks of the formation; they contain well-rounded cobbles which rarely exceed 15cm in diameter, have a highly variable matrix content, and at times grade up into sandstones. The thicker conglomerates encountered in the section outlined above contain much larger rudaceous material, up to 80cm in diameter, and are distinguished from similar rocks in the Kaurahoupo Formation by the variety of rock types they contain and by a much increased matrix content; these conglomerates nearly always have a matrix to boulder ratio that exceeds unity.

Age

Foraminiferal studies by Jenkins (1965) and Scott (pers. comm.) indicate that the age of the Paratoetoe Formation varies from Otaian to Upper Pareora or Altonian.

Provenance

The wide range of lithologies present in the conglomerates indicates derivation of the rocks from a landmass of considerable diversity. The nature of some of the material is apparent in hand specimen, but identification has in most cases been confirmed by thin-section study. Rock types recognised and their possible sources are summarised below.

Andesites similar to those found in the Kaurahoupo Conglomerate occur throughout the Paratoetoe Formation; varieties include pilotaxitic andesine andesite (9034) and quartz hornblende andesite (9035). These rocks undoubtedly come from the same source as those in the Kaurahoupo.

Altered basic lavas (9037) that are often mineralised and veined by zeolite and calcite can be matched petrographically with the lavas of the Whangakea Volcanics. Clasts of this type are widely distributed although not as common as those of little-altered andesite.

Grey flow-banded volcanics, not separated in the field, were found subsequently to be of two types; keratophyres (9038) similar to those described by Bartrum (1929) and Battey (1955) from the Cretaceous Mt Camel Volcanics, and dacites (9041) of the type found by Black (1967) in the Tokatoka district.

Gabbroic rocks (9039) indistinguishable from certain phases of the Kerr Pluton are of only rare occurrence, as are granitic types, including a graphic microcline granite (9040). The latter may have been derived from the reworking of Cretaceous conglomerates similar to those recorded farther south (Bell and Clarke, 1909; Battey, 1950), for the boulders are exceptionally well rounded.

A porphyrite (9042) in which most of the plagioclase has been pseudomorphed by prehnite could not be confidently ascribed to any known Northland rock unit.

Soft sandstone and siltstone fragments that closely resemble those of the Waitemata Group in this area are probably the result of submarine erosion during the emplacement of the conglomerates or of the erosion of material exposed on the margins of the trough following local upflexing.

Diverse calcareous sediments, including argillaceous and crystalline limestones and highly siliceous mudstones, quartzose sandstones, and cherts are found throughout the conglomerates; they have probably been derived in the main from Cretaceous or Lower Tertiary lithologies of similar type that are found throughout Northland.

WAIKUKU LIMESTONE

This unit, a highly fossiliferous calcarenite of Upper Lillburnian or Waiauan age which forms small outcrops along Waikuku Beach, has recently been described by Leitch *et al.* (1969). The relationship of these rocks to older strata is unknown.