Hibolithes brownei (Marshall), restricted to the basal zone of the upper part of the Puaroan Stage (Lower Tithonian) in the Kawhia-Waikato Heads sequence, is recorded from the Cheviot Hills (S62/530; Fleming, 1958: 386) and from the Kaiwara valley (S62/795), both occurrences in mudstone concretions known only as boulders.

Buchia plicata Zittel and *Belemnopsis* ex gr. *aucklandica* Hochstetter occur in boulders in conglomerate at the Hurunui swing bridge (S62/776; P. A. Maxwell, pers. comm.) in an area in which the earliest *in situ* collection (S62/505), made by Mr D. Hamilton, contained brachiopods, *Belemnopsis*, and phylloceratid ammonites (see McKellar, Mutch, and Stevens, 1962: 491). *Buchia plicata* marks the uppermost Puaroan zone at Kawhia.

Richly fossiliferous siltstones with *Malayomaorica* aff. *malayomaorica* (Krumbeck) occur on the Cheviot coast (S62/531, 532; Marwick *in* Fyfe, 1934), south of the Waiau mouth and in Gore Stream, Clarence valley (S41/531). *Malayomaorica* was locally gregarious, its crowded separated valves forming shell beds up to 4ft thick (as at S62/526; Plate 3). Near Cheviot siltstones with *Malayomaorica* are in sequence with and probably slightly older than concretionary siltstones with *Buchia* aff. *subpallasi* (Krumbeck), various distinctive species of *Inoceramus*, and *Anopaea* n.sp. (of Fleming, 1958). The two faunas lack forms on which to base close correlation with the Kawhia–Waikato Heads sequence, but recent collecting (P. A. Maxwell, pers. comm.) in the Kaiwara valley shows comparable species of *Inoceramus* and *Anopaea* in association with *Buchia plicata*.

Although field relations are imperfectly known, it is clear that Upper Jurassic time is represented in the north-eastern area of South Island Torlesse rocks by at least three of the molluscan zones established in the Kawhia–Waikato Heads sequence. The important Cheviot–Kaiwara region contains faunas including three species used as zonal indicators at Kawhia: *Inoceramus galoi, Hibolithes brownei,* and *Buchia plicata*. At least two other faunas that may prove to be useful stratigraphically are known, but neither can yet be placed in any zonal scheme. One of these (S62/534; near the Jed River) contains *Grammatodon*, a gastropod allied to *Trochotoma* (I. G. Speden, pers. comm.), *Psilotrigonia*, and brachiopods.

The second unplaced fauna comprises brachiopod-rich assemblages which characterise coarse-grained limestones in the Kaiwara valley and elsewhere. The limestones are invariably associated with basic, usually spilitic, volcanics, and in some places occur in interstices between pillows in lavas (as at S62/508). At least 5 species of rhynchonellids and terebratuloids are present. Some of these are large-shelled forms and locally they are preserved in large numbers with valves conjoined, rare pectinids being the only other fossils in the assemblage (S62/517). *Burmirhynchia warreni* and *Holcothyris*(?) *kaiwaraensis*, both of Campbell, 1965, are members of this assemblage.

Lensen (1962) mapped as Jurassic rocks including shell limestone near Taylors Pass, Marlborough (S28/479). The systematic placing of finely comminuted shell as either Permian *Atomodesma* or upper Mesozoic *Inoceramus* is a matter of some difficulty and the possibility of a Permian age for the Taylors Pass limestone cannot be completely dismissed.

Although Upper Jurassic fossils have been found in Torlesse rocks in a wide area of eastern Canterbury and Marlborough, and no certainly older post-Triassic fossils are known, no section has been described in which Upper Jurassic Torlesse rocks are shown to rest unconformably on Triassic or older beds.