

and more nearly horizontal, and is often inclined at only 30 or 40deg. However, some specimens in all Landon Series populations have the lunule as in normal Awamoan specimens, and a few specimens in all Awamoan populations have the more primitive type of lunule. Although this variation is exactly that expected in evolving organisms and fits in well with the phylogeny proposed below, it is not considered sufficient to distinguish two species as it is the only visible difference between Landon Series and Pareora Series populations.

A single almost complete interior from G.S.2568, Waihaorunga Stream, South Canterbury (probably Awamoan) is of the same size as large specimens of *Z. cretacea*. It differs from all other pre-Taranaki Series specimens in having the anterior adductor muscle scar groove at the anterior edge of the scar, as in *Z. acinaces*. The lunule is as in typical *Z. cretacea*. This specimen must be regarded as aberrant.

Two very poor indeterminable specimens of *Zenatia* have been examined from G.S.999, Waimate Stream, Waikato (Whaingaroan). They are the earliest known specimens of the genus, but unfortunately are of no use in clarifying its early history. They are probably very close to *Z. cretacea*.

Zenatia is rare in the Southland Series, specimens having been seen from 12 localities. Of these, only two collections are useful for this study. There are several large, well preserved specimens with the *cretacea* lunule, but with no other internal characters visible, from a richly fossiliferous concretion from Altonian (?) mudstone in Kaiwhata River one mile below Ngahape, Central Wairarapa. Also, one specimen 42 millimetres long and two smaller ones from the "Gari sand", Clifden Bed 7, Southland (Lillburnian) collected by Dr C. A. Fleming have the *cretacea* lunule, but being rather small could be juveniles of *Z. cf. acinaces*. Until the interiors of large specimens can be seen all Southland Series specimens are arbitrarily included under *Z. cretacea* as indeterminable specimens.

Figured specimens: Pl. 1, fig. 1, is of the holotype (TM2542), previously figured by Woods (1917: Pl. 16, fig. 9). All other figures are of the specimen from which the redescription was written (TM3845).

Zenatia flemingi Marwick, 1948. Text-fig. 2e.

1948. *Z. flemingi*. Marwick, N.Z. Geol. Surv. Pal. Bull. 16: 23, Pl. 2, figs. 1, 4, 12.

This species was described from Otahuhu Brewery Well, South Auckland (Waitotaran), and good specimens are not known from any other locality.

The shell is large, moderately inflated for *Zenatia* s.s., and rather thick and solid. The lunule slopes outwards towards the top of the shell as in *Z. cretacea*, but not as steeply as in that species, so that it hardly affects the anterior outline of the shell. The lunule is similar in shape and convexity to that of *Z. acinaces*, except that it extends a little further down the front edge of the shell. The lunule also has a less steeply angled posterior margin than in *Z. acinaces*, as it is parallel to much more widely spread cardinal teeth. The anterior adductor groove is central, as in *Z. cretacea*. The posterior arm of the left cardinal tooth is a little in front of the anterior wall of the resilifer rather than strictly confluent with it, and the left accessory cardinal lamella is parallel to and confluent with the top part of this wall.

The major difference from the members of the *Z. acinaces* lineage is in the cardinal angle, which is much larger in *Z. flemingi*. The cardinal angles of 22 measurable specimens average 80.71deg., and range from 73 to 88deg.