ied consist of a north-northwest–trending set of major folds with subordinate thrusts. The existence of previously unrecognized major folds was determined from detailed study of minor-fold geometry as well as reinterpretation of some Cretaceous stratigraphic boundaries. The folds involve Upper Jurassic through Upper Cretaceous rocks, while Tertiary sedimentary rocks occur in a monoclinal belt along the eastern edge of the study area. A well-developed cleavage is present throughout. A structural profile of the transect is being constructed.

Wilson also measured detailed stratigraphic sections in the Lower Cretaceous rocks. Together with sedimentologic data and petrographic results, these sections will provide a more detailed understanding of the early evolution of the Magallanes basin.

The cooperative Lamont-Doherty–British Antarctic Survey (BAS) geophysical study involved radar ice-echo sounding by a BAS "Twin Otter" aircraft (using fuel left by the United States in the Ellsworth Mountains at the end of the 1979–80 season) to fly along tracks jointly selected for their tectonic as well as glaciological significance. The main objective was to improve our understanding of the morphology and interrelationships of the obvious continental blocks of the Antarctic Peninsula, Ellsworth Mountains, and Thurston Island areas. The aircraft also obtained profiles across major glaciers within the Ellsworth Mountains and along gravity traverses measured previously by Robert Rutford.

A total distance of 15,700 kilometers was flown in 78.5 hours using all the fuel available. Four lines were flown at maximum range of the aircraft to the Bryan Coast and Pine Island Glacier, four lines at maximum range over the Ronne Ice Shelf towards the Antarctic Peninsula, and two lines covering local features within and around the Ellsworth Mountains.

The survey delimited the catchment area of Pine Island Glacier and gave valuable information on the nature of the sub-ice surface as well as the sub-ice topography itself (Doake and Crabtree, *Antarctic Journal*, this issue).

The British Antarctic Survey scientists most closely involved with the work are Charles Swithinbank, head of the Earth Sciences Section, Christopher Doake, and Richard Crabtree. Peter Clarkson, Geoffrey Renner, and Michael Thomson participated in planning the flight program.

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Preliminary bivalve zonation of the Latady Formation

J. A. CRAME

British Antarctic Survey
Natural Environment Research Council
Madingley Road
Cambridge CB3 0ET, England

A primary aim of the 1977–78 U.S. Geological Survey field party to the Orville Coast (figure 1) was to investigate the biostratigraphy of the Jurassic Latady Formation, which is well exposed in this region. Preliminary results of this fieldwork (Rowley 1978, 1979; Thomson, Laudon, and Boyles 1978) include synopses of the paleontology. In addition, Thomson (1980) has given a brief review of the principal ammonite faunas. This article is a complementary report on another fossil group with considerable biostratigraphic potential, the bivalves.

Predominantly composed of shallow-water volcaniclastic sediments, the Latady Formation is now known to be one of the major sedimentary formations of the Antarctic Peninsula. It can be traced from the Lyon Nunataks-Behrendt Mountains region through the Orville and Lassiter coasts to the southern Black Coast (figure 1) (Rowley 1978; Thomson et al. 1978). Lack of continuous exposures and considerable tectonic deformation mean that the true thickness of the formation on the Orville Coast may be considerably more than the 830 meters measured by Thomson and others (1978, p. 9). While the Fossil Bluff Formation of Alexander Island (figure 1) accumulated in a fore-arc environment to the west of the peninsula, the Latady Formation has generally been interpreted as a back-arc deposit (Suarez 1976).

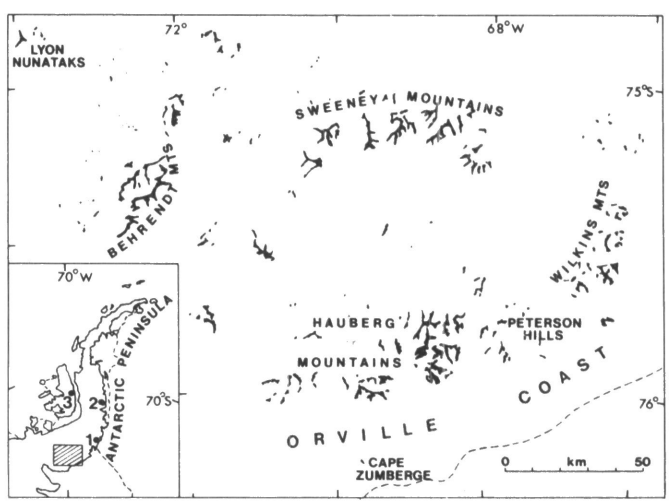

Figure 1. Map of the Orville Coast region. The shaded area on the inset shows the relationship of this region to the Antarctic Peninsula. The numbers 1, 2, and 3 refer to the Lassiter Coast, southern Black Coast and Alexander Island, respectively.

Initial paleontologic studies in the Lyon Nunataks-Behrendt Mountains region indicated a Middle to Late Jurassic age for the Latady Formation: Quilty (1970) described Middle Bajocian, Lower Callovian, and Oxfordian ammonites, and Stevens (1967) and Quilty (1977), Kimmeridgian bivalves and belemnites. No further systematic studies of Latady Formation fossils have been published, but preliminary investigations of both Orville and Lassiter Coast faunas suggest an essentially Late Jurassic age (Rowley and Williams in press; Thomson et al. 1978). An interesting finding of studies in both these regions is that bivalves are particularly abundant. Large robust forms, such as inoceramids and astartids, are much in evidence, and arcaceans, buchiids, oxytomids, entoliids, pectinids, and trigoniids are all common.

The 1977–78 field party brought back large collections of bivalves from a series of localities in the Hauberg Mountains, Peterson Hills, and Wilkins Mountains (figure 1). Particularly common at these localities are small buchiidlike bivalves and large inoceramids. Many of the former, although poorly preserved, can be identified as the distinctive Southern Hemisphere bivalve, *Malayomaorica malayomaorica* (Krumbeck) (figure 2), and the latter as representatives of the genus *Retroceramus* (figure 2). Precise species identifications of the inoceramids have yet to be completed, but their large size, characteristic outlines, and prominent concentric ornament (figure 2) mean that they can almost certainly be referred to the *R. haasti* (Hochstetter)-*R. subhaasti* (Wandel) group. This association of *M. malayomaorica* with the *R. haasti-subhaasti* group is a very common one in Late Jurassic strata throughout the Southern Hemisphere. They occur together in New Zealand (Fleming and Kear 1960; Spörli and Grant-Mackie 1976), Indonesia (Krumbeck 1923; Wandel 1936), New Guinea (Glaessner 1945; Skwarko 1967) and New Caledonia (Freneix, Grant-Mackie, and Lozes 1974). Their age in New Zealand has been established as Lower Ohauan (Middle Kimmeridgian), and this seems to be consistent with their stratigraphic occurrences in all other regions (Jeletzky 1963; Stevens 1965). A Kimmeridgian age for strata exposed in the Hauberg Mountains-Wilkins Mountains region is also compatible with the known ammonite data: Thomson (1980) concluded that the perisphinctid-dominated faunas had a Kimmeridgian to Early Tithonian age.

In his study of the Late Jurassic bivalves of eastern Ellsworth Land, Quilty (1977) demonstrated overwhelming similarities with the Heterian (Lower Kimmeridgian) faunas of New Zealand. Especially prominent are the Heterian index species, *Inoceramus (= Retroceramus) galoi* (Boehm) and *Vaugonia kawhiana* (Trechmann). Thus, it would appear that, whereas the Lyon Nunataks-Behrendt Mountains region (figure 1) is characterized by Heterian strata, the Hauberg Mountains-Wilkins Mountains region (figure 1) is characterized by Ohauan strata. A southeasterly trend toward younger strata is further indicated by the presence of sedimentary rocks of probable Tithonian age at Cape Zumberge (figure 1). No bivalves have yet been collected from this locality, but there are a number of berriasellid ammonites with strong Late Tithonian affinities (Thomson 1980).

The predominance of Heterian and Ohauan strata in the Lyon Nunataks-Behrendt Mountains-Orville Coast region strongly suggests that the Latady Formation largely predates the Fossil Bluff Formation of Alexander Island (figure 3, next page). The lowermost beds of the latter, the so-called "disturbed zone," contain ammonites and belemnites with Kimmeridgian affinities and *R. haasti* (Taylor, Thomson, and Willey 1979; Thomson 1979); therefore they are Ohauan in age. Succeeding beds, however, contain Tithonian ammonites and buchiid bivalves belonging to the *Buchia blanfordiana* (Stoliczka) group (Thomson 1979). Only the rocks exposed at Cape Zumberge are likely to be equivalent in age to these (figure 3).

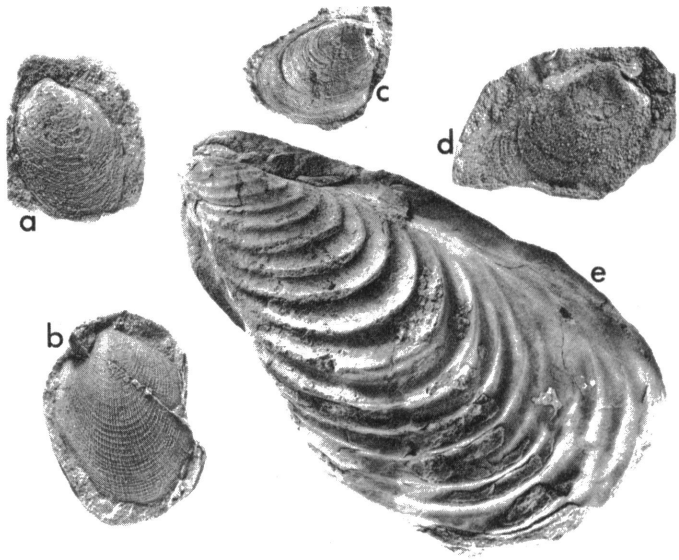

Figure 2. Two common bivalve species from the Latady Formation of the Orville Coast: (a–d) *Malayomaorica malayomaorica* (Krumbeck) (a and b are molds of left valves, c and d of right valves; original shell lengths 23–29 millimeters); (e) a large member of the *Retroceramus haasti-subhaasti* group, viewed from the left side (original shell length 195 millimeters).

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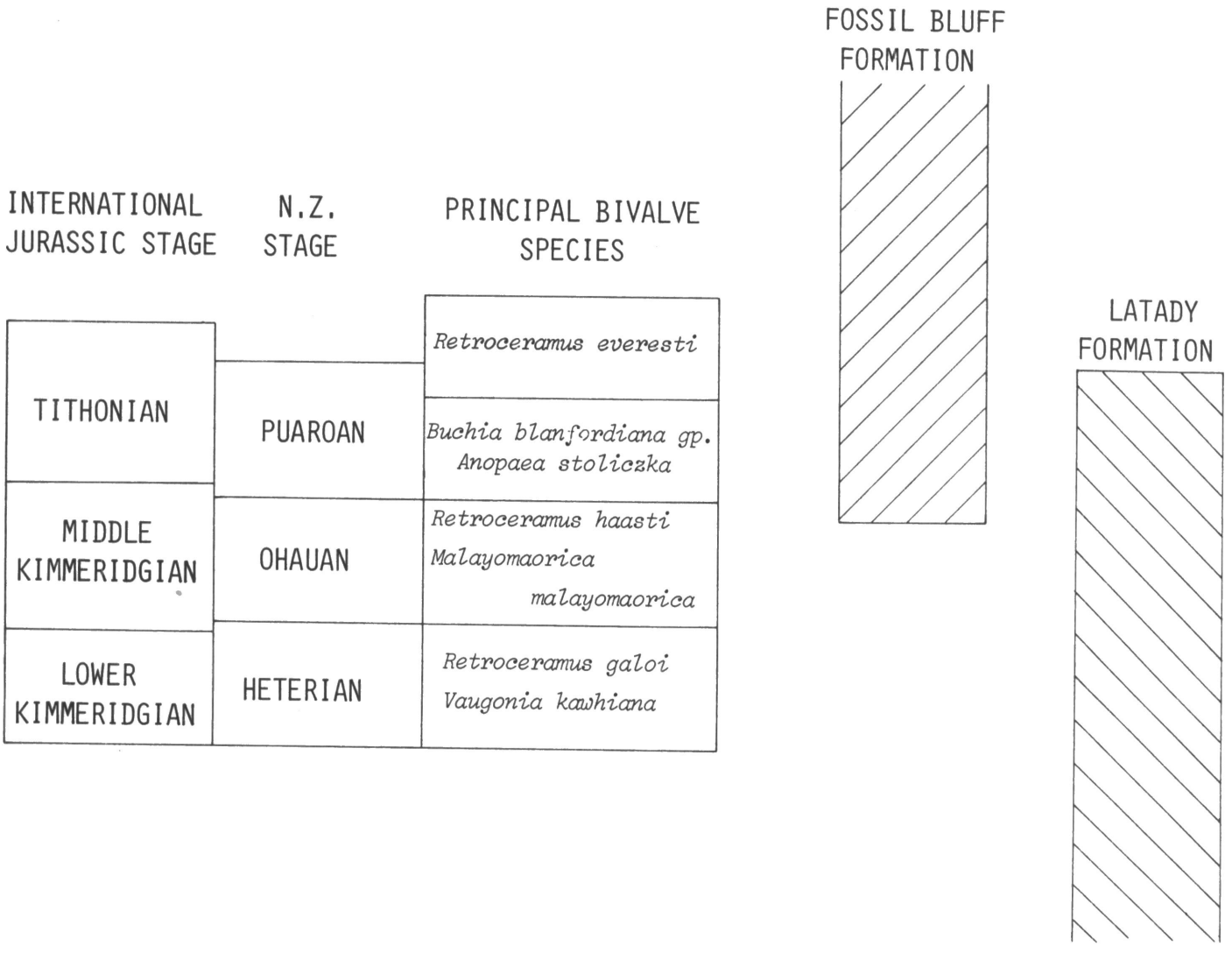

Figure 3. Stratigraphic correlation between Latady and Fossil Bluff formations using bivalve zones.

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