SESSION 1: DESCRIPTION OF THE AREA AND ITS ADMINISTRATION

REEFS OF THE GREAT BARRIER REEF NORTH OF LIZARD ISLAND

G.R. Orme

A B S T R A C T

The diversity of reef types, their distribution, form and orientation, reflects the influence of growth, oceanographic, eustatic, sedimentation, and foundation factors. The shelf-edge "ribbon reef" is characteristic of this region, platform and patch reefs are numerous, and fringing reefs occur in the near shore zone and are associated with the continental (high) islands.

There are contrasts in the physiographic characteristics of the platform reefs due to marked variations in the nature and distribution of reef top accumulations which have been strongly influenced, and stabilized, in part by diagenetic processes.

Investigations initiated during the Royal Society and Universities of Queensland Expedition (1973) have demonstrated the thin and uneven nature of the Holocene reefal veneer, and have indicated the significance of inherited (pre-Holocene) features on Holocene reefs, sediment distribution patterns, and bathymetry of this part of the Great Barrier Reef Province.

I N T R O D U C T I O N

The Great Barrier Reef north of Lizard Island, lying entirely within the Northern Region defined by Maxwell (1968), is relatively shallow (usually less than 30m), has a distinctive pattern of reef distribution, and, for the most part, occupies the narrowest section of the Queensland shelf. In this area, shelf width varies from 33 km in the south to 28 km at its narrowest, opposite Cape Melville, and reaches 160 km off Cape York. Due to fault control and the upward growth of shelf-edge reefs, the continental shelf ends abruptly and the continental slope descends steeply to the Coral Sea Basin and the Queensland Trough. Conspicuous continental islands (High Islands) occur in the Howick Group,

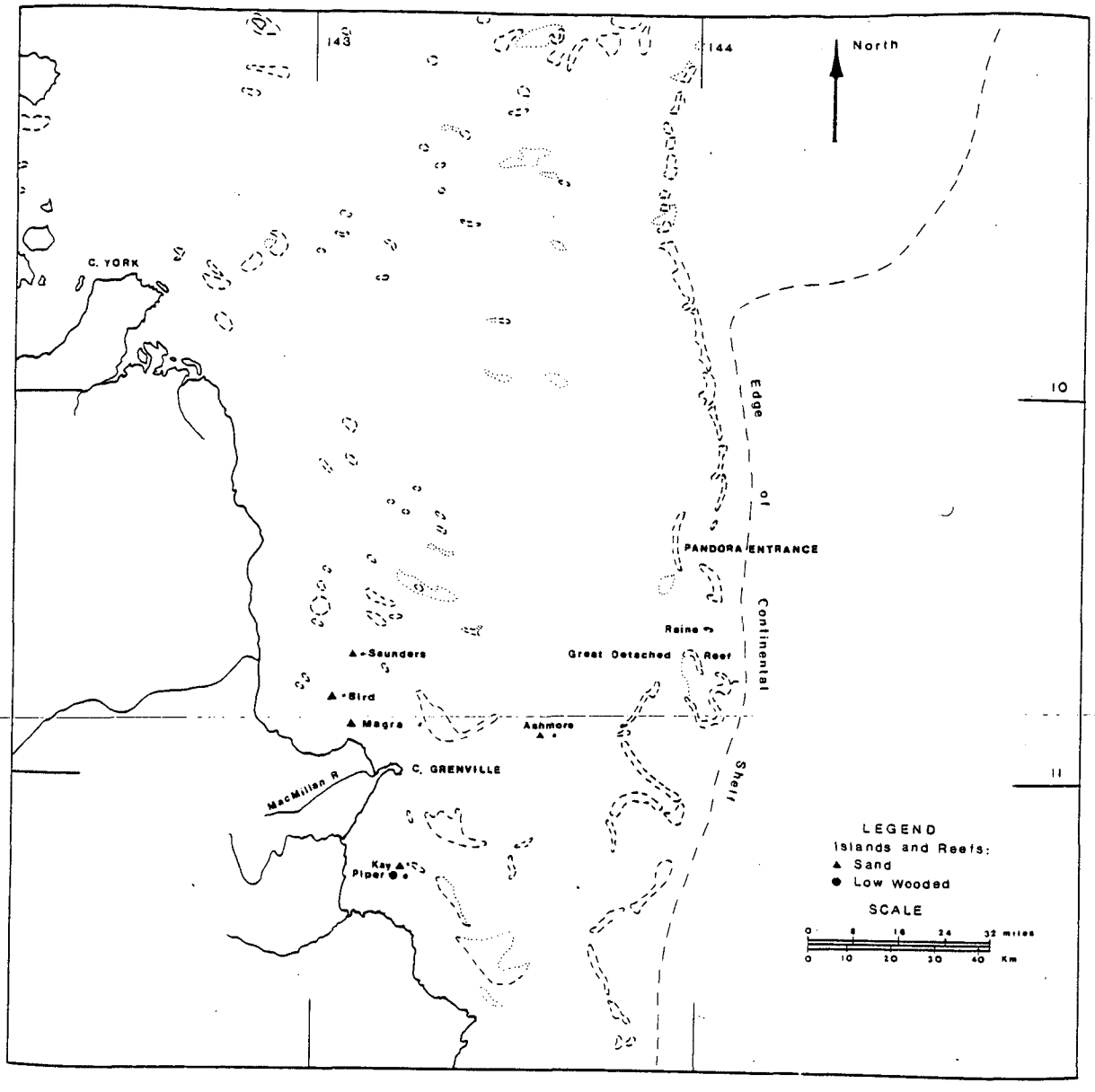

Figure 2: Map of the northern part of the Great Barrier Reef indicating islands and cays mapped by D.R. Stoddart during the "Royal Society and Universities of Queensland Expedition" (1973).

Continental Shelf Sediments

The regional distribution of sediment facies, described and mapped by Maxwell (1968), reflects the influence of terrigenous sediment from the mainland and the carbonate production of the reefs. Thus, the terrigenous facies fringes the shore in an almost continuous zone in the southern part of this area and is succeeded across the shelf by the transitional facies, impure carbonate facies and high carbonate facies. Under the influence of discharge into Princess Charlotte Bay from the Normanby River, a broadening of the terrigenous and transitional facies zones occurs. However, northward of Princess Charlotte Bay the transitional facies borders the mainland shore and the terrigenous facies is restricted, which implies a significant supply of carbonate sediment from nearshore reefs. The pure carbonate facies also broadens northward extending from the shelf-edge and covering more than half of the continental shelf.

Detailed studies of the shelf sediments and sedimentation have been carried out in Princess Charlotte Bay (Frankel, 1974), and in the vicinity of the Howick Group (Flood, Orme, and Scoffin, 1978). A detailed sediment sampling programme which encompassed the entire shelf width between latitudes $14^{o}30'S$ and $15^{o}5'S$, was undertaken during the Royal Society and Universities of Queensland Expedition. A comprehensive study of these sediments has recently been completed by Orme and Flood, and the results are being prepared for publication. Relict features are important in this area and sedimentation factors are complex.

A recently published bibliography of the geology and hydrology of the Great Barrier Reef and the adjacent Queensland coast is included in a review by Jones (1977).

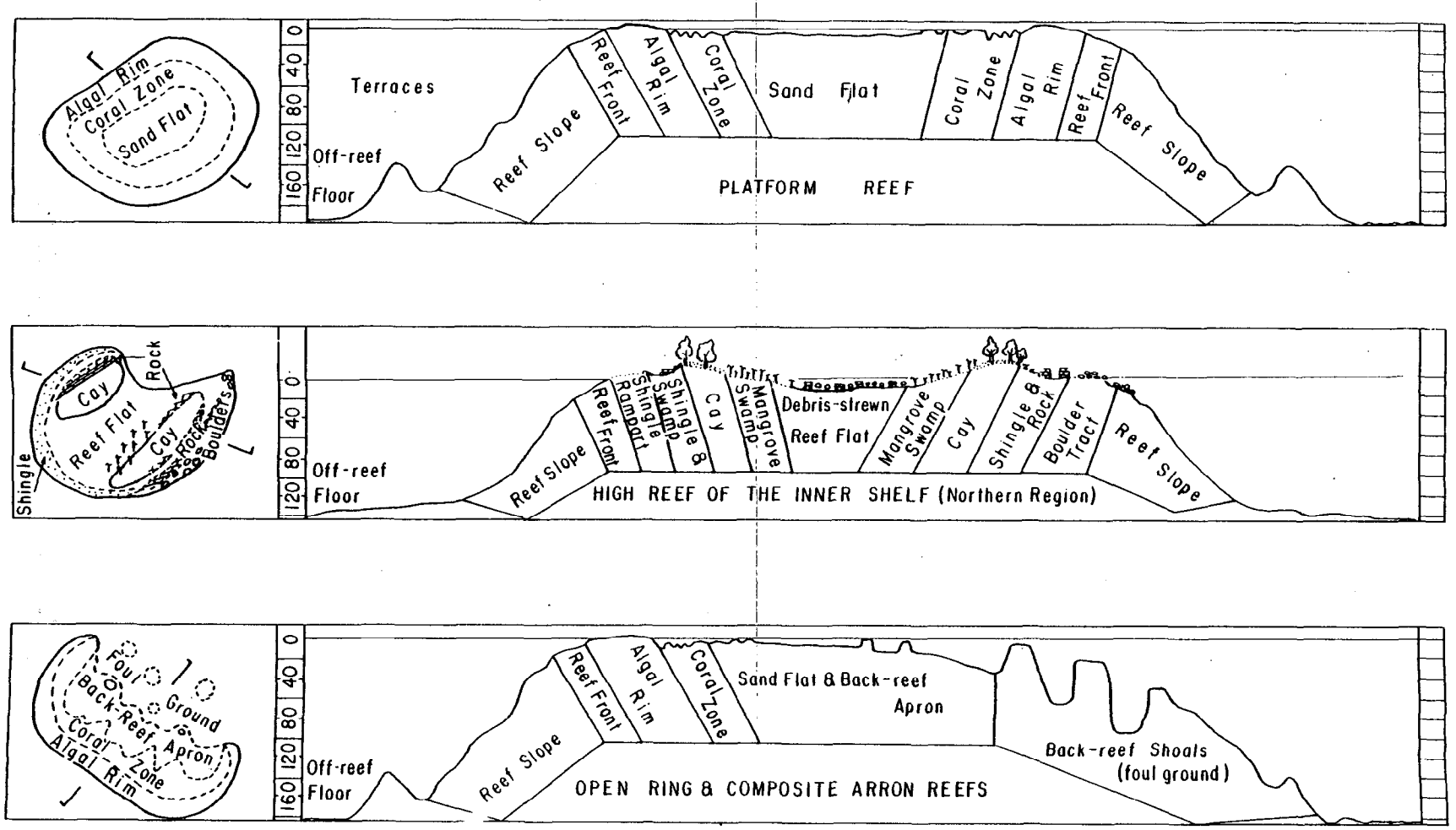

Figure 3: Reef profiles of common reef types showing the general physiographic zonation (after Maxwell, 1968).