

Structure and sedimentology in the Scotia Arc: South Georgia and the southernmost Andes

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The long-term project to study the tectonic evolution of the Andean-West Antarctic Cordillera and of the Scotia Arc, supported by National Science Foundation grants GV-19543 to Dalziel and GV-36656 to Dott, was continued during the austral summer 1972-1973, with structural and sedimentologic studies in South Georgia and the southernmost Andes. The authors, together with Ronald L. Bruhn of Columbia University and

Robert D. Winn of the University of Wisconsin, Madison, spent approximately 6 weeks on the island of South Georgia. Bruhn and Winn then did further work in the Fuegian Andes immediately north of Canal Beagle. During the same period Drs. Maarten de Wit and Keith Palmer of Columbia University did field work in the Patagonian Andes with geologists of the Empresa Nacional del Petroleo (Chile).

Dott began the sedimentologic studies at the University of Wisconsin 10 years ago with work along the coast of the Antarctic Peninsula (Halpern, 1965; Scott, 1965) and in Patagonia (Scott, 1966). The structural studies have been carried out from Columbia University at localities throughout the Scotia Arc over the last 5 years (Dalziel, 1969, 1970, 1971, 1972a; Dalziel *et al.*, 1970; Palmer and Dalziel, 1973).

On South Georgia we studied mainly the rocks in the vicinity of Cumberland Bay, including the crucial contact between the Cumberland Bay and Sandebugten sequences. We believe that the Sandebugten sequence is merely a facies of the Early Cretaceous Cumberland Bay rocks, rather than the equivalent of the probable upper Paleozoic Trinity Peninsula series of the Antarctic Peninsula as previously suggested (Trendall, 1953, 1959;



Figure 1. Mt. Hodges with its Z-shaped fold of Cumberland Bay graywackes and shales. The RRS *Bransfield* is moored in the foreground at Grytviken, an old whaling station.



Figure 2. Allardyce Range with Mt. Paget and Nordenskjöld Glacier.

Adie, 1964). The Cumberland Bay sequence has been overfolded and thrust northeastwards over the Sandebugten sequence, away from the Pacific side (Dalziel, 1972b).

In Tierra del Fuego, Bruhn and Winn have been studying the structure and sedimentology of the early Cretaceous Yahgan graywackes and shales that are probably equivalent to the South Georgia sedimentary rocks (Katz and Watters, 1966), although perhaps more distal. Farther north, in Chile, de Wit, Palmer, and the Chilean geologists have been examining principally an ophiolite suite that appears to form the basement for part of the Yahgan/Cumberland Bay sediments, although elsewhere they rest on Paleozoic metamorphics (Palmer and Dalziel, 1973). The scientific results of all segments of this study soon will be published in more detail.

The opportunity for us to study the geology of South Georgia was offered by Sir Vivian Fuchs, director of the British Antarctic Survey, which administers the island. The Survey generously provided food and fuel for our work. We are particularly indebted to Dr. R. J. Adie, deputy director, and Mr. Derek Gipps, senior logistics officer, for their advice and assistance. Mr. Rikky Chinn, base commander at South Georgia, and all the Survey

personnel gave us continued help and extended a warm welcome to their home on the island. For transportation to and from South Georgia and landings at points on the island, we are grateful to Captain T. Woodfield and the officers and men of RRS *Bransfield*. Our work in southern South America could not have been accomplished without the logistics and scientific support of Eduardo Gonzales P., Raúl Cortés R., and the staff of the Departamento de Exploraciones of the Empresa Nacional del Petroleo in Chile.

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Geologic observations on the northern Lassiter Coast and southern Black Coast

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During the 1972-1973 austral summer, the third and final field season of reconnaissance geologic investigations for the Lassiter Coast project took place with the exploration of the Playfair, Dana, and Werner Mountains in the Lassiter Coast and an unmapped and unnamed range in the Black Coast to the north. The geology has many similarities to that farther south in the project area studied during the two previous seasons (Williams, 1970; Williams and Rowley, 1971; Williams *et al.*, 1972).

The oldest exposed rocks belong to the Latady Formation, a thick sequence of monotonous black slate and siltstone with lesser gray fine-grained sandstone. The Latady Formation is somewhat coarser in the western

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Soviet exchange scientist Eugene Kamenev looks north across the 10-kilometers-wide Mosby Glacier, at the quartz monzonite wall of Mount Adkins, in the unnamed mountains of the Black Coast.