

Geological studies along Patagonian coast, R/V *Hero* cruise 78-3, July 1978

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The R/V *Hero* sailed from Ushuaia, Argentina, on 8 July 1978, proceeded northward along the coast of Patagonia conducting field research, and arrived at Puerto Belgrano, Argentina, on 28 July.

The principal research objective of this voyage was to investigate the stratigraphic and faunal relationships of the Tertiary marine and nonmarine sequence exposed along the coast of Patagonia with sequences of similar age in Tierra del Fuego and the Antarctic Peninsula. In addition to the stratigraphic and paleontologic aspects of the program, samples were to be collected for paleomagnetic and radiometric studies.

These objectives, however, could not be fully realized. Work along the southern coast of Patagonia between Río Gallegos and Río Santa Cruz had to be prematurely terminated because of poor weather and hazardous sea conditions. Because of the inclement conditions, only a single landing was attempted at the mouth of the Río Santa Cruz, where a small collection was made. The re-

mainer of the cruise was spent around Peninsula Valdés in the tranquil waters of Golfo Nuevo and Golfo San Jose.

The Tertiary rocks are exceptionally well exposed along the sea cliffs of Peninsula Valdés and along the bays. The sequence consists of nearly horizontal sandstones and siltstone that have been divided into three lithologic units—the so-called “Patagonian,” Entrerriense, and Rionegrense. Overlying the Tertiary sequence are the Patagonia gravels. The age of these Tertiary units is uncertain. Strata assigned to the “Patagonian” are believed to range in age from Eocene to Lower Miocene. The Entrerriense and Rionegrense are believed to be of Mio-Pliocene age.

The Peninsula Valdés region has been stable during most of the Cenozoic, except for minor periods of regional uplift and subsidence. These, in combination with eustatic sea-level changes, have resulted in a number of localized transgressions and regressions.

During the *r/v Hero* cruise 78-3, a total of 14 stratigraphic sections were measured along the coasts of Golfo Nuevo and Golfo San Jose. At each section, large collections were made of fossils along with samples for radiometric dating and paleomagnetic analysis. The thickness of the Entrerriense and Rionegrense varied from section to section.

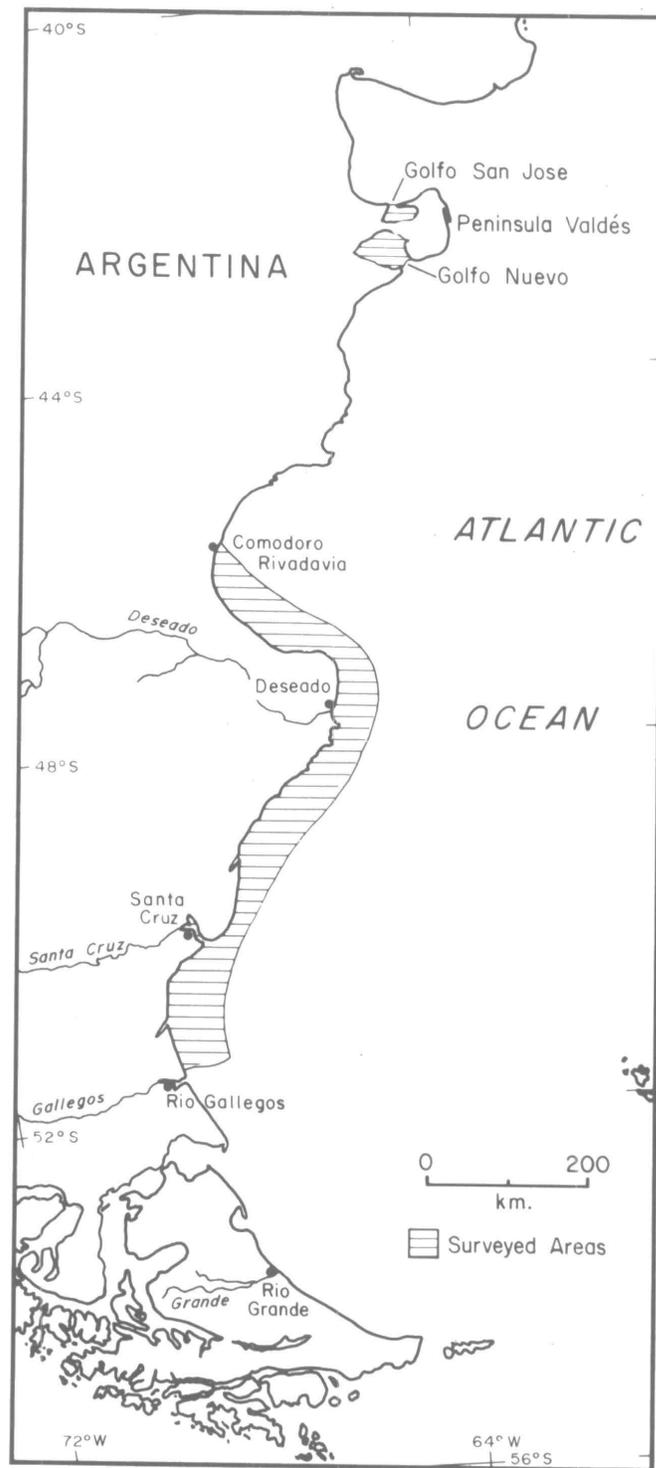
Previous investigators (Frenguelli, 1926; Feruglio, 1949) considered the Entrerriense and Rionegrense to be two distinct lithologic units. However, the field relations observed during cruise 78-3 indicate that the upper part of the Entrerriense is the temporal equivalent of the lower part of the Rionegrense. The sedimentary sequence represents the gradual filling of a shallow basin, with the Entrerriense representing shallow marine gradually changing to beach-mudflat facies of the Rionegrense. The lithology of the upper beds of the Entrerriense gradually change from fine-grained fossiliferous sandstones to flaser bedding, eventually being replaced by large cross-bedded dunes with occasional fossiliferous lenses and gypsiferous horizons of the Rionegrense.

Preliminary analysis of thick tuffaceous bed from the Rionegrense gives a radiometric age of 9 to 9.5 million years. This would place the age of the Rionegrense-Entrerriense of the Peninsula Valdés region in the Middle Miocene rather than the Late Miocene to Pliocene as originally believed.

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References

- Feruglio, E. 1949. Descripción geológica de la Patagonia, vol. II, YPF, Buenos Aires.
- Frenguelli, J. 1926. Apuntes sobre el Cuaternario de los alrededores del golfo Nuevo en el Chubut. Soc. Arg. Est. Geog. GAEA, II (2): 241-55.



The coast of Patagonia, Argentina, showing the areas surveyed by *r/v Hero* during cruise 78-3 in the austral winter of 1978.