

Benthic foraminifera from Deception Island

KENNETH L. FINGER
Department of Geology
University of California, Davis
Davis, California 95616

One of the South Shetland Islands, Deception Island is a caldera formed by a series of volcanic episodes (Hawkes, 1961). Cinder cones arose most recently in August 1970 off Telefon Ridge at the north end of the island (Baker and McReath, 1971). Gallardo and Castillo (1968) have shown that previous eruptions and extensive debris and ashfalls had a devastating effect on the macrobenthos within Port Foster. The present study is concerned with the distribution of foraminifera and how recent eruptions have shaped this pattern.

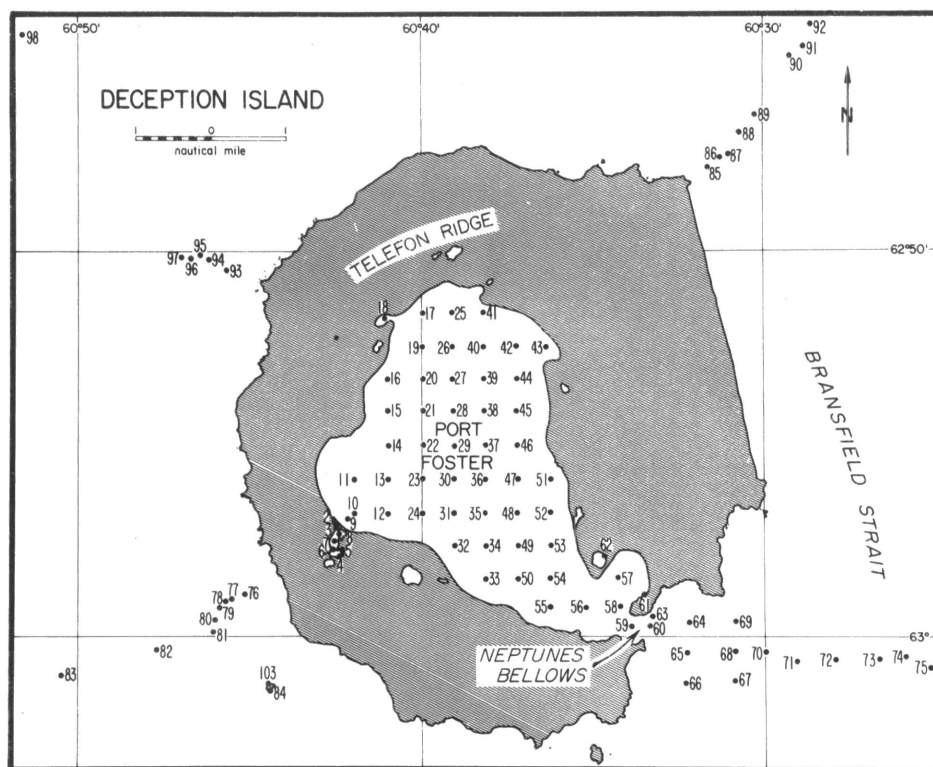
In January 1974, a team headed by Jere H. Lipps aboard the research ship *Hero* made a detailed sampling of the Deception Island area (figure 1) as part of a large-scale study of the distribution of foraminifers along the Antarctic Peninsula (Lipps and DeLaca, 1974). The samples were sent to the

University of California, Davis, for later study.

The compiled Port Foster fauna (stations 2 to 58) consist almost entirely of, in order of relative abundance, *Fursenkoina fusiformis*, *Nonionella bradyi*, *Miliammina arenacea*, *Trochammina malovens*, and *Globocassidulina crassa*. Other locally abundant species are *Hippocrepinella hirudinea*, *H. alba*, and *Saccammina sphaerica*. Diversity tends to increase in the vicinity of Neptunes Bellows, where strong currents probably mix the more diverse fauna of Bransfield Strait with those within Port Foster. The Bransfield Strait fauna is comprised mostly of *Globocassidulina crassa*, *Rosalina globularis*, *Cribratomoides jeffreysi*, *Pseudoparrella exigua*, *Trochammina malovens*, *T. ochracea*, *Trifarina angulosa*, *Cibicides lobatulus*, *Fursenkoina fusiformis*, and *Adercotryma glomeratum*. Local concentrations of *Fursenkoina earlandi*, *Bolivina pacifica*, and *Haplophragmoides parkerae* were also found. Twelve of the 85 species present comprise approximately 95 percent of the total foraminiferal population from the Deception Island area.

A number of environmental parameters, including depth, substrate grain-size and texture, currents, and temperature are being investigated to determine whether they can be correlated with, and attributed to, the distribution of foraminifers.

Support for this research was provided by National Science Foundation grant gv-31162.



Sampling stations occupied by R/V *Hero* at Deception Island. Samples were taken with a Dietz-Lafond grab.

References

- Baker, P. E. and I. McReath. 1971. 1970 volcanic eruption at Deception Island. *Nature (Physical Science)*, 231(18): 5-9.
- Gallardo, V. A., and J. G. Castillo. 1968. Mass mortality in the benthic infauna of Port Foster resulting from the eruptions in Deception Island (South Shetland Islands). Concepción, Instituto Antártico Chileno. *Publicación*, 16. 11p.
- Hawkes, D. D. 1961. The geology of the South Shetland Islands, II: the geology and petrology at Deception Island. Falkland Islands Dependencies Survey. *Scientific report*, 27. 43p.
- Lipps, J. E., and T. E. DeLaca. 1974. Foraminiferal ecology, Antarctic Peninsula. *Antarctic Journal of the U.S.*, IX(4): 111-113.

Benthic community studies in the South Shetland Islands

V. A. GALLARDO

Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543

J. G. CASTILLO

School of Oceanography
Oregon State University
Corvallis, Oregon 97331

M. A. RETAMAL, J. HERMOSILLA, and R. TRUCCO
Departamento de Biología Marina y Oceanografía
Universidad de Concepción
Concepción, Chile

Since 1967, under the sponsorship of the Instituto Antártico Chileno and the Universidad de Concepción, our team has been studying the soft-bottom macroinfauna of antarctic bays, with both quantitative and qualitative gear. Plankton and hydrography observations have been performed concurrently whenever possible. Until now our efforts have been limited to the summer season, but we plan to expand them soon to year-round work from existing Chilean antarctic bases.

Normally, the work has been done from Chilean navy ships during their routine summer tasks in the Antarctic. Field support by the Chilean navy has not been possible on two occasions (now and in the 1968-1969 summer) and the National Science Foundation has in these cases been kind to provide the opportunity for us to work on board R/V *Hero*, although transportation of the science team to and from Antarctica has been by Chilean navy units.

The work in 1975 comprised revisiting and samp-

ling at standard stations in Port Foster (Deception Island), Chile Bay (Greenwich Island), and Admiralty Bay (King George Island) in the South Shetlands.

The benthic fauna of Port Foster was altered drastically during the 1967 eruption (Gallardo and Castillo, 1968, 1969, and 1970), and by two subsequent eruptive events (1969-1970), giving a good opportunity for study of the reestablishment of the benthic fauna. Observations there (24 orange-peel grab samples, seven dredges, and 24 horizontal plankton samples) during January 20-21, 1975, showed that in general the benthic fauna of the bay has diversified, although the substratum has changed drastically because of continuing secondary ash deposition in the basin.

Admiralty Bay was sampled primarily to obtain sponges and tunicates to implement a new program, at the Laboratorio de Productos Naturales, Universidad de Concepción, whose purpose is to isolate substances with possible antitumoral activity. Eight dredge samples were secured here on January 22.

Chile Bay, unaffected by past eruptive events at Deception Island, has been sampled almost every summer since 1967 as a reference point for our Port Foster study. In 1975, 15 orange-peel grab samples, one dredge haul, and 13 horizontal plankton tows were taken on January 25-26. Analysis of these collections is giving insight into the complexity and the stability of antarctic level-bottom communities, as well as the stages of recovery of Port Foster's benthic fauna. The infauna of Chile Bay has been observed to have assemblages of high diversity.

The field team in 1975 consisted of Messrs. Retamal, Hermosilla, and Trucco. We extend our appreciation to our North American colleague, J. H. Lipps, for sharing his cruise time with us, and to Pieter Lenie, *Hero's* master, for valuable help in the field.

References

- Gallardo, V. A., and J. G. Castillo. 1968. Mass mortality in the benthic fauna of Port Foster resulting from the eruptions in Deception Island (South Shetland Islands). Concepción, Instituto Antártico Chileno. *Publicación*, 16: 3-13.
- Gallardo, V. A., and J. G. Castillo. 1969. Quantitative benthic survey of the infauna of Chile Bay (Greenwich Island: South Shetland Islands). *Gayana*, 16. 18p.
- Gallardo, V. A., and J. G. Castillo. 1970. Quantitative observations on the benthic macrofauna of Port Foster (Deception Island) and Chile Bay (Greenwich Island). In: *Antarctic Ecology* (M. W. Holdgate, editor). New York, Academy. Volume I: 242-243.