elements, the eyes of *E. superba* contain several unusual morphological features. The distal end of the rhabdom is capped by a conical refractive structure (DRE) (figure 2), which is continuous with a refractile axial channel complex. The complex extends through the clear zone to the proximal tip of the crystalline cone. The high refractivity of these structures suggests an optical function, as first proposed by Kampa (1965), but their actual role has not been determined. A similar conical refractive element (PRE) is located at the proximal end of the rhabdom. The rhabdom itself is fused and composed of alternating layers of orthogonally oriented microvilli contributed by the seven retinula cells of each ommatidium. This kind of rhabdom structure has been associated with polarized light sensitivity in other crustaceans (Waterman 1981) and may have such a function in *E. superba* as well.

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Euphausiid larval distribution in the Scotia Sea, 1979–1980

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The rich material of euphausiid larvae from the 1979 *Islas Orcadas* cruise in the Scotia Sea (1 March to 5 April) provided the impetus for a careful analysis of the pattern of distribution of larvae during the antarctic austral summer. Special effort was made during the 1980–81 season to examine and identify the euphausiid larvae in four locations in the western and eastern sectors of the Scotia Sea (figure 1). Another objective was to compare the euphausiid larval distribution north and south of the Antarctic Convergence northwest of South Georgia Island.

The samples were obtained at discrete depths down to 1,000 meters with the use of the Reeve plankton sampler containing a 5-gallon cod-end capsule. The procedure followed—capturing the larvae alive and then fixing them for taxonomic identifications—permitted healthy recovery of the minute euphausiid larval forms (1–11 millimeters in length) without any morphological mutilations.

The study revealed the dominance of calyptopis and furcilia stages of *Thysanoessa* sp. in the western sector of the Scotia Sea, which also contained furcilia larvae of *Euphausia frigida*. Advanced furcilia larvae of these two euphausiid species also were encountered in the eastern sector of the Scotia Sea. We presume that these two species tend to breed in the Scotia Sea. However, the larval abundance of the *Thysanoessa* sp. is several orders of magnitude greater than that of *E. frigida*.

In the eastern Scotia Sea, larval forms of two other antarctic euphausiid species, *E. spinifera* and *E. triacantha*, were found in appreciable numbers. It is of interest that there were no larvae of these two species in samples from the western Scotia Sea. Furthermore, various furcilia stages (figure 2) of the euphausiid *E. triacantha* appear to show a significant abun-

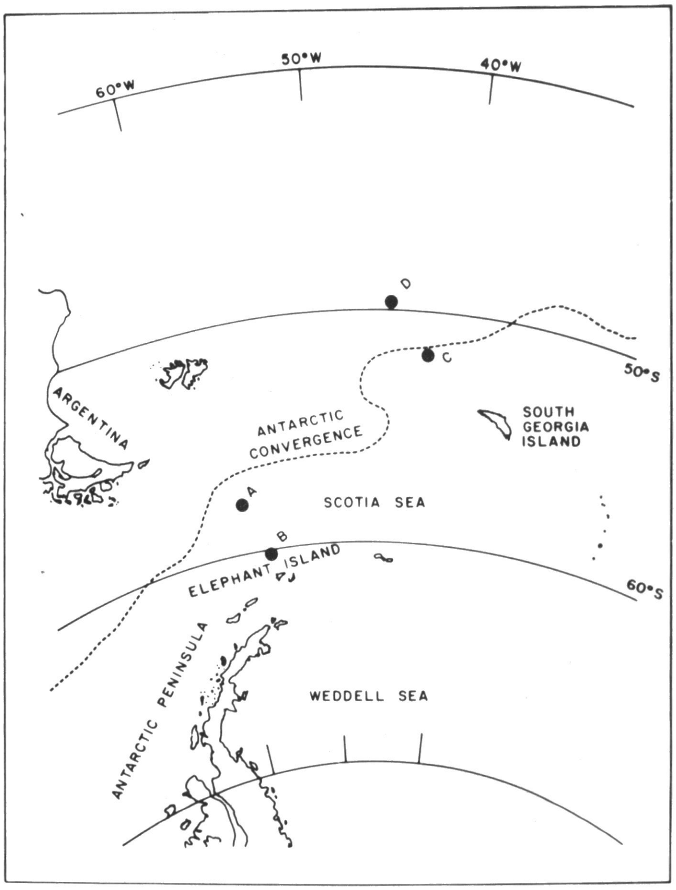

Figure 1. Area map showing the four sampling stations in the Scotia Sea.

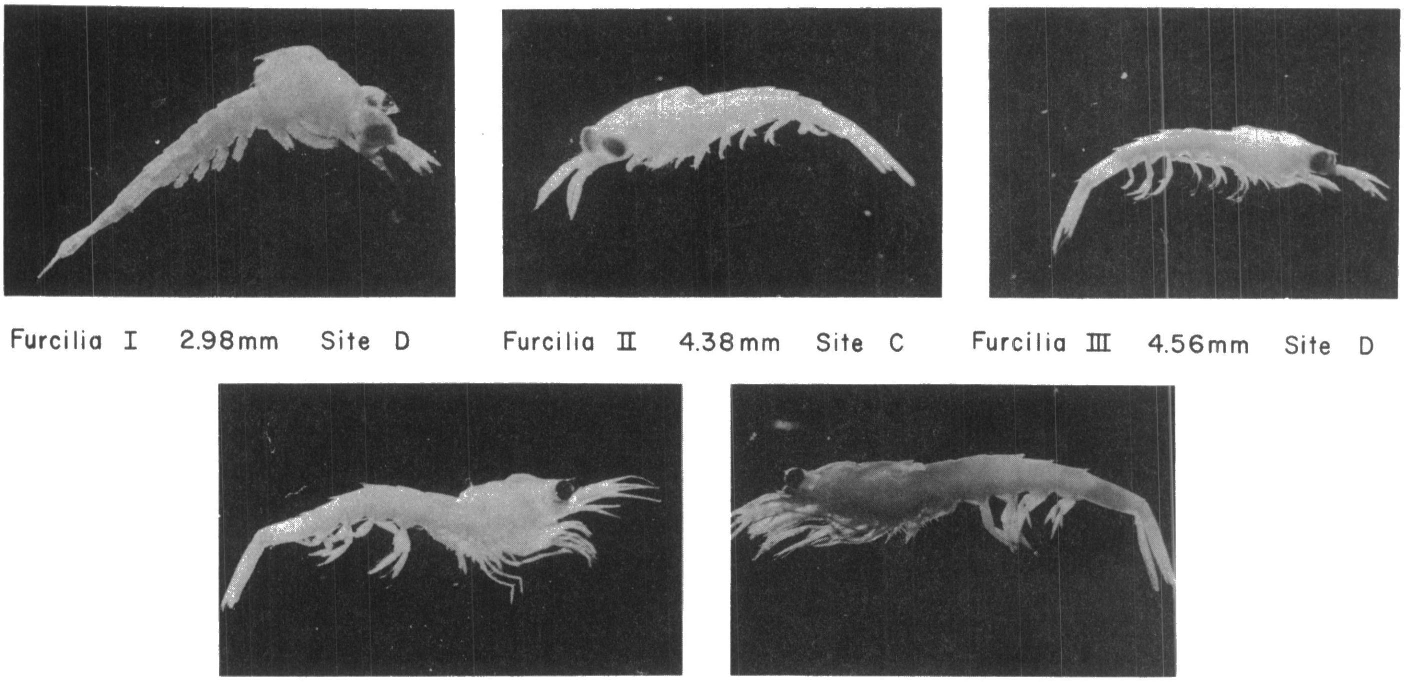

Figure 2. Furcilia larvae of *Euphausia triacantha* from the vicinity of the Antarctic Convergence northwest of South Georgia Island.

dance in the vicinity of the Antarctic Convergence, particularly at site D located north of the convergence. *E. triacantha* may require a higher breeding temperature (5° to 7°C) than does the cold-adapted southern euphausiid species. Samples from all four study sites visited during austral summer 1979 lacked the antarctic krill *E. superba* larvae. Nevertheless, *E. superba* larvae were found during the same cruise in the northern Weddell Sea at stations south of Elephant Island. This finding is in agreement with findings on krill larvae reported by Irmtraut Hempel of Kiel University, West Germany (Hempel 1979; Hempel, Hempel, and de C. Baker 1979). It is becoming increasingly evident that early larval stages of *E. superba* are seen primarily in the Bransfield Strait-Weddell Sea area and that embryological development takes place at greater depths (George 1980). On the basis of these results, further experiments on development of krill embryos and larvae will be performed at Palmer Station during the 1982 austral summer.

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Protein synthesis and reproduction in fishes of McMurdo Sound

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The fishes of Antarctica are a highly specialized group of vertebrates that have evolved to achieve an extraordinary degree of cold adaptation (DeWitt 1971). This project is concerned with the molecular basis of temperature adaptation at the subcellular, cellular, and organismal levels. Studies are focused on the protein synthetic system, which represents the final expression of hereditary information and is closely linked with basal metabolism, growth, and reproduction.

Large numbers of *Trematomus* species were obtained by fishing through the ice in the McMurdo area. In addition, 20