m^2. The standing stock of nannoplankton (smaller than 10 μm), microplankton (10–60 μm) and netplankton (larger than 60 μm) was 15.73±1.78, 8.39±3.96 and 7.73±4.87 mg chl. a/m^2, respectively, and their mean percent contributions to the total chlorophyll *a* stocks were 52.6, 25.1 and 22.3%, respectively. The standing stock of nannoplankton chlorophyll *a* was almost constant in all water masses, while those of the micro- and netplankton showed large fluctuations. Thus, the cause of the regional variations of the standing stock of phytoplankton chlorophyll should mainly be attributed to the variations of micro- and netplankton standing stocks. (p. 111–128)

PHYTOPLANKTON COLLECTED DURING THE FIBEX CRUISE OF THE UMITAKA MARU III, 1980–1981; A PRELIMINARY REPORT

Teru IORIYA and Mitsuo KATO

From November 1980 to March 1981, 145 phytoplankton taxa were identified in 30 samples collected at various stations on the FIBEX Cruise of the T/S UMITAKA MARU III of the Tokyo University of Fisheries. The classification of phytoplankton were: 65 taxa of Bacillariophyceae, 68 taxa of Dinophyceae, 2 taxa of Cyanophyceae, one taxon of Euglenophyceae, 8 taxa of Chrysophyceae and one taxon of Cryptophyceae. Tables of stations and species with preliminary notes on the distribution patterns of phytoplankton in the Antarctic, temperate and tropical waters are given. Brief taxonomic notes are also given for some of the predominant and rare phytoflagellates. (p. 129–144)

PRELIMINARY REPORT ON THE BIOMASS OF MACROPLANKTON AND MICRONEKTON COLLECTED WITH A BONGO NET DURING THE UMITAKA MARU FIBEX CRUISE

Takashi MARUYAMA, Hiroshi TOYODA and Shigemi SUZUKI

Zooplankton biomass in the austral summer in the western Pacific sector of the Southern Ocean was estimated. The mean total biomass was 28.8–31.1 g/1000 m^3 in the richer regions and 14.1–20.1 g/1000 m^3 in the poorer ones. These values were similar to the previous estimates. However, the maximal values were extremely smaller than those of the previous ones. Copepods were most abundant, and chaetognaths, euphausiids and amphipods followed. There seemed to be at least two types of waters represented by different zooplankton assemblages. *Euphausia superba* occurred only at the southernmost station. (p. 145–153)

CONTINUOUS COLLECTION OF MACROPLANKTON BY A FISH PUMP AT SURFACE LAYER IN THE ANTARCTIC OCEAN; A PRELIMINARY REPORT

Yoichi SASADA

Continuous samplings of macroplankton were conducted at two regions with a fish pump connected with the cod-end of the KMT-net by a hose from the surface layer of the Antarctic Ocean during the FIBEX Cruise of the T/S UMITAKA MARU III.

Occurrence of the species at the surface water closely related to the surface light intensity. Both the number of species and number of individuals increased with the decreasing of the light intensity. The reaction of the species to light intensity varied with

according to species. A "reverse" diel vertical migration was observed between *Calanus propinquus* and *Parathemisto gaudichaudii* in the surface water. None of fishes were collected in the present sampling.

Biomass of krill in background water, outside of patches, was estimated to 1.59×10^{-3} wet wt g/m^3 in the present sampling. It was very small to compare previous estimate of the standing stock in the Antarctic Ocean. (p. 155–166)

FILTERING AND INGESTION RATES OF THE ANTARCTIC KRILL, *Euphausia superba* DANA

Mitsuo KATO, Susumu SEGAWA, Eiichiro TANOUE and Masaaki MURANO

The filtering and ingestion rates of the Antarctic krill, *Euphausia superba* DANA, were experimentally estimated using samples of a variety of body size. The filtering rate in m*l*/individual/hr, measured in natural seawater, increased with increase in body dry weight. The relationship between the filtering rate (y) in m*l*/ind./hr and body dry weight (x) in mg is given as $y=16.4+0.205x$ ($r=0.654$). The filtering rate in m*l*/mg dry weight/hr decreased with increase in body dry weight, and became level in large krill over 100 mg in body dry weight. In mass experiment, the filtering rates obtained in seawater with high concentrations of phytoplankton were much higher than those in seawater with low concentrations. Ingestion rates obtained in seawater with low concentrations of phytoplankton were 14.4–55.9 μgC/ind./day in large krill (102.1–127.3 mg in dry wt) and 6.0–38.8 μgC/ind./day in small krill (8.3–26.8 mg in dry wt). In seawater with high concentrations of phytoplankton, the ingestion rates were 1468–1915 μgC/ind./day in large krill (240.7–247.9 mg in dry wt) and 183–211 μgC/ind./day in small krill (10.1–13.4 mg in dry wt). Considering losses by respiration and moulting, the krill ingest actively by filter feeding when phytoplankton is plentiful, but if phytoplankton is sparse the filter feeding becomes inactive, and the krill would depend on other food by predation. (p. 167–175)

RESPIRATION AND AMMONIA EXCRETION RATES OF THE ANTARCTIC KRILL, *Euphausia superba* DANA

Susumu SEGAWA, Mitsuo KATO and Masaaki MURANO

Respiration and ammonia excretion rates of the krill *Euphausia superba* in the Antarctic Ocean were measured using the Winkler titration method and an auto-analyzer (Technicon CMS-6 Water Analyzer System), respectively. The live krill used in this experiments were collected in the BIOMASS/FIBEX Cruise of the T/S UMITAKA MARU III, from December 1980 to January 1981. The experiments were carried out twice during the cruise in Antarctic Sea. The samples ranged from 6.1 to 385.4 mg in dry weight. The respiration rate was measured of 3.31–139.97 μl O_2/individual/h (or 0.193–1.228 μl O_2/mg dry weight/h), and the ammonia excretion rate 0.006–0.705 μg atom N/ind./h (or 0.57–$5.88\cdot10^{-3}$ μg atom N/mg dry wt./h) at 0°C. The respiration and ammonia excretion rates per individual increased in proportion with body weight. The regression of respiration rate (R, μl O_2/ind./h) and ammonia excretion rate (E, μg atom N/ind./h) in relation to body dry weight (W, mg) in whole individuals of the first and second legs were shown as: $\log R=0.0259+0.8331 \log W$ and $\log E=-3.0100+1.2107 \log W$, respectively. The ratio of respiration rate and ammonia excretion rate (O/N ratio by atom) varied from 8.26 to 95.42 and the mean and S.D. were 28.29 ± 18.84. The ratio was generally higher than 24 in the average and it suggested that the major metabolite of the krill was lipid rather than protein. (p. 177–187)