VOLUME I  RECEPTORS -- MAMMALS
VOLUME II  RECEPTORS -- BIRDS
VOLUME III RECEPTORS -- BIRDS
VOLUME IV  RECEPTORS -- BIRDS
VOLUME V   RECEPTORS -- BIRDS
VOLUME VI  RECEPTORS -- FISH
VOLUME VII RECEPTORS -- FISH
VOLUME VIII RECEPTORS -- FISH
VOLUME IX  RECEPTORS -- FISH
VOLUME X   RECEPTORS -- FISH
VOLUME XI  RECEPTORS -- MICROBIOLOGY
VOLUME XII EFFECTS
VOLUME XIII CONTAMINANT BASELINES
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* indicates final report
ANNUAL REPORT

Contract No. 03-5-022-68, Task Order 5
Research Unit #6
Reporting Period: 1 April 1976-31 March 1977

The distribution, abundance, diversity and productivity of the western Beaufort Sea benthos.

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School of Oceanography
Oregon State University
Corvallis, Oregon 97331

March 16, 1976

John J. Dickinson
I. Summary of Objectives, Conclusions and Implications with Respect to OCS Oil and Gas Development.

Extensive oil and gas development on the Alaskan and Canadian north slope has the potential to significantly influence the marine environment of the Beaufort Sea continental shelf. It is impossible with our present knowledge to accurately predict the consequences of petroleum development on the marine benthos. The goal of this study is to begin acquiring the knowledge of the ecology of benthic invertebrate faunas of the Beaufort Sea continental shelf necessary to evaluate the consequences of petroleum development. The spatial and temporal variability of benthic communities are being examined in detail, and will provide a baseline from which future changes in the benthic environment and community structure can be evaluated.
II. Introduction

A. General nature and scope of the problem.

The distribution, abundance and natural variability of benthic macro-infauna will be described on the southwestern Beaufort Sea continental shelf. Patterns of faunal distributions will be described and characterized using suitable bio-indices and multivariate techniques. Seasonal changes in the structure of benthic populations will be studied by sampling four times within a single year.

B. Specific Objectives

We propose to describe the benthic infauna of the western Beaufort Sea continental shelf including studies of both geographic and seasonal variability. Data are to be obtained on the faunal composition and abundance to form baselines to which potential future changes can be compared.

Specific objectives include the continuation of studies and analyses to:

1. Describe the distribution, species composition, numerical density, and biomass of the benthos in the area of interest.
2. Describe the spatial and seasonal variability of faunal distributions and abundances.
3. Describe the benthic communities present and delineate their geographical and environmental extent.
4. Describe the effect of seasons on population size and reproductivity activity of dominant species.

5. Determine the degree of correlation of species distributions and of various bio-indices with features of the benthic environment.

C. Relevance to Problems Associated with Petroleum Development.

Extensive drilling for oil and gas on the Alaskan and Canadian north slope has the potential to significantly influence the marine environment across the Beaufort Sea continental shelf. It is impossible with our present state of knowledge to accurately predict either the short or long term consequences of petroleum development on the marine benthos. Comprehensive descriptive studies of the benthic fauna in the Beaufort have only been initiated in the last few years. These studies are a necessary first step in providing a baseline from which any future changes in the benthic environment and community structure can be evaluated.

To date, little is known about the functioning of the benthic ecosystem in the Beaufort Sea. There have been no studies on the dynamics of the benthic populations in this region. No reliable estimates of natural mortality are available, and recruitment rates remain unknown. Little research has been done on the metabolism and growth rates of these organisms living under ice for a large part of the year. Lacking this information it is
very difficult to predict how quickly benthic populations could recover from an extinction event caused by a large-scale oil spill or by other industry-related pollution.

The benthic invertebrates constitute a major source of food for the top level carnivores, including birds, seals, and occasional walrus. Any decrease in benthic populations caused by oil pollution might eventually be reflected in the populations of these larger animals. Nearshore areas would seem to be the most sensitive since it would be in these regions that pollutants would be most likely to mix to the benthic boundary.

The timing of environmental disturbances in this strongly seasonal environment may be extremely critical in determining the stresses experienced by the benthic community. For example, an oil spill in the winter on top of the pack ice could be cleaned up with little or no resultant damage to the marine benthos, while a spill of the same magnitude during a summer of open water might have significant impact. It remains to be determined if the bottom-dwelling invertebrates are more or less sensitive to oil related pollution during the summer months, but the pelagic larvae of the benthic organisms would be vulnerable to spills during periods of open water conditions.

It seems likely that the development of the oil and gas resources will bring about changes in the marine environment, but the extent of degradation in the benthic environment cannot be predicted. There remains a great scientific need for long term studies on the dynamics of the benthic populations, including year round sampling with measurements on growth, metabolism, and reproductive activity.
III. Current State of Knowledge.

The history of benthic sampling in the Beaufort Sea and the results of all previous studies was documented in great detail in the final report of Contract No. 03-5-022-68, Task Order No. 4 submitted to NOAA/BLM by the Benthic Ecology Group at Oregon State University under Dr. Andrew G. Carey, Jr.
IV. Study Area.

The Beaufort Sea is one of the seven satellite seas bordering the Arctic Ocean. In contrast to the other six shallow seas, the Beaufort is deep, has a limited continental shelf, and is physically and oceanographically a part of the Arctic Ocean (Coachman, 1963). It forms one of the boundaries for the Canada Basin and extends along the northern coast of Alaska to the western edge of the Canadian Archipelago.

The continental shelf in this region is very narrow with a break that averages 70 meters in depth in the southwestern portion (Carsola, 1954; Carsola et al., 1961). The continental shelf in general is covered with mud (Carsola, 1954), although sands occur nearshore and patches of gravel are found particularly near the shelf break (Barnes and Reimnitz, 1975). The sediments in the region of the shelf off Prudhoe Bay are unusually patchy, are highly oxidized and contain low amounts of organic carbon (Carsola, 1954; Naidu and Mowatt, 1975).

Ice forms on the surface of the southern Beaufort Sea in September and October and covers the continental shelf until June or July (Barnes and Reimnitz, 1975). Shorefast ice increases in thickness until the end of May and extends seaward to a water depth of 10-20 m where it impinges on the main polar ice pack. Beyond this shear zone the pack moves in a generally westward direction as part of the clockwise polar gyre. During the short arctic summer the ice breaks up and the edge of the pack usually recedes beyond the shelf break, though its location is highly variable from year to year (U.S. Navy Hydrographic Office, 1958). Drifting and grounded ice floes can be present on the continental shelf throughout the summer. From the work of Kovacks and Mellor (1975), Reimnitz and Barnes (1975), and Barnes and Reimnitz (1975), it is evident that grounded
sea ice is a major process influencing the shelf sediments. Offshore beyond the shear zone, grounded pressure ridge keels and ice islands plow along the shelf at random intervals and rework the sediments to a significant extent.

Hydrographically, the Beaufort Sea contains three major identifiable water masses: (1) a mixed Arctic surface water (0-250 m), (2) an intermediate Atlantic water layer (250-900 m) with temperatures slightly above 0°C, and (3) the Arctic bottom water (below 900 m) with uniform salinities and temperatures always below 0°C (Coachman and Barnes, 1961; Coachman, 1963). The surface layer is a mixture of continental runoff, seasonal ice melt, and intrusions of water from the Bering and Chukchi Seas. The surface water may occasionally be enriched by coastal upwelling in certain areas; it has been detected at the shelf edge north of the Barter Island region during open water conditions (Hufford, 1975; Mountain, 1975).

Because of the highly stratified water column, the Beaufort Sea is thought to support very low levels of annual primary production (English, 1961; Meguro et al., 1966). The short summer season coupled with high variability in ice cover and insolation should contribute toward a low carbon input to the ecosystem. However, recent work has demonstrated a significant population of under-ice diatoms in polar regions (Meguro et al., 1966; Bunt and Lee, 1970; Horner and Alexander, 1972; Horner, 1974). These shade-adapted species, in conjunction with recently detected upwelling, may support higher annual production levels adjacent to the continent than previously anticipated (McRoy et al., 1972).
V. Sources, Methods and Rationale of Data Collection.

A. General

In order to examine the spatial and temporal variability of the Beaufort Sea continental shelf benthos, two transect lines were sampled seasonally. This sampling strategy enabled us to obtain samples from benthic infauna populations from all seasons and from the full range of depths represented on the continental shelf. These two transect lines were selected because they were located in areas of potential importance to petroleum development (see Figure 1).

B. Field Sampling

The field techniques utilized in this study have been described in detail in previous reports to NOAA/BLM and will therefore be presented only in summary fashion here. A 0.1 m² Smith-McIntyre grab has been used exclusively to collect quantitative samples of benthic infauna populations. Summer sampling was done off the U.S.C.G.C. GLACIER and the R/V ALUMIAK. Sampling during the other seasons involved the use of a helicopter and special "through-the-ice" sampling techniques. At all stations occupied at least five biological samples and one sediment sample were collected. The biological samples were processed using a Cascading Multiple Siever System retaining all animals larger than 0.42 mm. The animals were preserved in buffered formalin and shipped back to O.S.U. for further processing.
Figure 1. Station Location Map.
C. Laboratory Methods

The processing of infaunal samples in the laboratory is a time-consuming process involving the picking of all the animals from the sediment debris of the 1 mm fraction. The picked animals are sorted to phylum, weighed, and counted. The animals are stored in 70% ethanol while awaiting species identification. Presently, the gammarid amphipods are being identified. It is hoped that the molluscs, polychaetes, and other crustaceans will be identified in the future. The data from these infaunal samples is being tabulated and keypunched in order to be submitted to NOAA/BLM. Further details of sample workup have been reported in previous reports to NOAA/BLM.
VI. Results

Over two hundred grab samples have been collected during the six OCS field trips (Table 1). The major sampling effort was directed toward obtaining a complete set of seasonal samples from the Pitt Point Stations between 25 and 100 meters. Sample picking and sorting, as well as subsequent determinations of animal density and biomass have been completed for all samples collected through OCS-4. The density and biomass data are summarized in Tables 2 and 3. Detailed data for individual grab samples have been reported in previous quarterly reports (see October 1976, December 1976, and March 1977).

The gammarid amphipods from OCS-1, OCS-2, and OCS-3 have been identified to species. Tables 4-8 list the dominant species at each station for each field trip. Complete species lists for the amphipods may be found in quarterly reports for December 1976 and March 1977.
Table 1. A List of Benthic Biological Samples Collected During the Six Field Trips Sponsored by the OCS Program.

<table>
<thead>
<tr>
<th></th>
<th>PPB-5</th>
<th>OCS-1 Oct. 75</th>
<th>OCS-2 Mar. 76</th>
<th>OCS-3 May 76</th>
<th>OCS-4 Aug. 76</th>
<th>OCS-5 Aug. 76</th>
<th>OCS-6 Nov. 76</th>
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<tbody>
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<td>10</td>
<td></td>
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<td></td>
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<td></td>
<td>5</td>
</tr>
</tbody>
</table>

|      |      |               |               |              |              |              |              |
|      | NIB-5|               |               |              |              |              |              |
| 10   |      |               |               |              |              |              | 5            |
| 15   |      |               |               |              |              |              | 5            |
| 25   |      |               |               |              |              |              | 5            |
| 40   |      |               |               |              |              | 7            |              |
| 55   |      |               |               |              |              | 7            |              |
Table 2. Mean animal densities per meter squared for the benthic macro-infauna. Number in parenthesis represents the number of samples from which the density values were derived.

<table>
<thead>
<tr>
<th></th>
<th>OCS-1</th>
<th>OCS-2</th>
<th>OCS-3</th>
<th>OCS-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPB-25</td>
<td>1390 (5)</td>
<td>1190 (10)</td>
<td>1120 (5)</td>
<td>1510 (5)</td>
</tr>
<tr>
<td>PPB-40</td>
<td>---</td>
<td>650 (5)</td>
<td>1370 (5)</td>
<td>3280 (5)</td>
</tr>
<tr>
<td>PPB-55</td>
<td>4800 (5)</td>
<td>4690 (6)</td>
<td>9530 (6)</td>
<td>4500 (5)</td>
</tr>
<tr>
<td>PPB-70</td>
<td>---</td>
<td>8680 (5)</td>
<td>7750 (5)</td>
<td>7440 (5)</td>
</tr>
<tr>
<td>PPB-100</td>
<td>6540 (4)</td>
<td>4470 (10)</td>
<td>16,010 (5)</td>
<td>8830 (5)</td>
</tr>
<tr>
<td>NIB-25</td>
<td></td>
<td></td>
<td></td>
<td>950 (5)</td>
</tr>
<tr>
<td>NIB-40</td>
<td></td>
<td></td>
<td>5150 (5)</td>
<td></td>
</tr>
<tr>
<td>NIB-55</td>
<td></td>
<td></td>
<td>2300 (5)</td>
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</table>
Table 3. Mean wet preserved weight in grams per meter squared for the benthic macro-infauna. Number in parenthesis represents the number of samples from which the density values were derived.

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<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PPB-25</td>
<td>44.5 (5)</td>
<td>24.4 (10)</td>
<td>26.1 (5)</td>
<td>22.0 (5)</td>
</tr>
<tr>
<td>PPB-40</td>
<td>---</td>
<td>11.8 (6)</td>
<td>85.6 (5)</td>
<td>110.7 (5)</td>
</tr>
<tr>
<td>PPB-55</td>
<td>38.1 (5)</td>
<td>37.5 (10)</td>
<td>67.0 (6)</td>
<td>151.8 (5)</td>
</tr>
<tr>
<td>PPB-70</td>
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<td>64.4 (5)</td>
<td>71.0 (5)</td>
<td>193.7 (5)</td>
</tr>
<tr>
<td>PPB-100</td>
<td>68.7 (4)</td>
<td>45.0 (10)</td>
<td>187.0 (5)</td>
<td>66.3 (5)</td>
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<td>NIB-25</td>
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<td></td>
<td>23.9 (5)</td>
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<td>NIB-40</td>
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<td>44.1 (5)</td>
<td></td>
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<td>NIB-55</td>
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<td>29.0 (5)</td>
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Table 4. Dominant Amphipod Species Collected During OCS-2 and OCS-3 From PPB-40. S = Number of Species N=Number of specimens.

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<thead>
<tr>
<th>OCS-2</th>
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<tr>
<td>Byblis arcticus</td>
<td>Harpinia kobjakouae</td>
</tr>
<tr>
<td>Harpinia kabjakouae</td>
<td>Aceroides latipes</td>
</tr>
<tr>
<td>Ampelisca eschrichti</td>
<td>Ampelisca eschrichti</td>
</tr>
<tr>
<td>Monoculopsis longicornis</td>
<td>Arrhinopsis longicornis</td>
</tr>
<tr>
<td>Aceroides latipes</td>
<td>Gammarus sp. AA</td>
</tr>
<tr>
<td>Protomedeia fasciata</td>
<td>Byblis arcticus</td>
</tr>
<tr>
<td>Haploops tubicola</td>
<td></td>
</tr>
<tr>
<td>Byblis gaimardi</td>
<td></td>
</tr>
<tr>
<td>Haploops laeuis</td>
<td></td>
</tr>
</tbody>
</table>

S = 15
N = 52

S = 11
N = 42
Table 5. Dominant Amphipod Species Collected During OCS-1, OCS-2 and OCS-3 from PPB-25. \( S = \) Number of Species; \( N = \) Number of Specimens.

<table>
<thead>
<tr>
<th>Species</th>
<th>S</th>
<th>N</th>
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</thead>
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<tr>
<td>Haploops tubicola</td>
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<tr>
<td>Arrhis phyllonyx</td>
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<td></td>
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<tr>
<td>Aceroides latipes</td>
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<td>35</td>
</tr>
<tr>
<td>Roxinate fragilis</td>
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<td></td>
</tr>
<tr>
<td>Monoculodes packardi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monoculopsis longicornis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onisimus litoralis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gammarus sp. AA</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Byblis gaimardi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harpinia kobjakouae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haploops laeuis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6. Dominant Amphipod Species Collected During OCS-1, OCS-2, and OCS-3 From PPB-55. S = Number of Species; N = Number of Species.

<table>
<thead>
<tr>
<th>OCS-1</th>
<th>OCS-2</th>
<th>OCS-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photis vinogradova</td>
<td>Unciola leucopsis</td>
<td>Photis vinogradova</td>
</tr>
<tr>
<td>Unciola leucopsis</td>
<td>Photis vinogradova</td>
<td>Tiron spinifera</td>
</tr>
<tr>
<td>Tiron spinifera</td>
<td>Paraphoxus oculatus</td>
<td>Byblis arcticus</td>
</tr>
<tr>
<td>Haplooops setosa</td>
<td>Tiron spinifera</td>
<td>Harpinia serrata</td>
</tr>
<tr>
<td>Harpinia serrata</td>
<td>Guernea nordensioldi</td>
<td>Paraphoxus oculatus</td>
</tr>
<tr>
<td>Goesia depressa</td>
<td>Haplooops setosa</td>
<td>Photis rheinhardt</td>
</tr>
<tr>
<td>Paraphoxus oculatus</td>
<td>Harpinia serrata</td>
<td>Guernea nordensioldi</td>
</tr>
<tr>
<td>Guernea nordensioldi</td>
<td>Ampelisca eschrici</td>
<td>Unciola leucopsis</td>
</tr>
<tr>
<td>Podoceropsis lindhaldi</td>
<td>Podoceropsis lindhaldi</td>
<td>Westwoodilla megalops</td>
</tr>
<tr>
<td>Protomedeia fasciata</td>
<td>Byblis arcticus</td>
<td>Byblis sp. BB</td>
</tr>
</tbody>
</table>

S = 38            S = 34            S = 34            
N = 350           N = 547           N = 810          

Table 7. Dominant Amphipod Species Collected During OCS-1, OCS-2, and OCS-3 for From PPB-100. S = Number of Species; N = Number of Specimens.

<table>
<thead>
<tr>
<th>OCS-1</th>
<th>OCS-2</th>
<th>OCS-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haplooops laeuis</td>
<td>Unciola leucopis</td>
<td>Unciola leucopis</td>
</tr>
<tr>
<td>Harpinia serrata</td>
<td>Harpinia serrata</td>
<td>Guernea nordenskioldi</td>
</tr>
<tr>
<td>Hippomedon abyssi</td>
<td>Photis vinogradova</td>
<td>Podoceropsis inaequistylis</td>
</tr>
<tr>
<td>Unciola leucopis</td>
<td>Hippomedon abyssi</td>
<td>Photis rheinhardi</td>
</tr>
<tr>
<td>Guernea nordenskioldi</td>
<td>Guernea nordenskioldi</td>
<td>Tiron spinifera</td>
</tr>
<tr>
<td>Anonyx nugax</td>
<td>Photis rheinhardi</td>
<td>Podoceropsis lindhaldi</td>
</tr>
<tr>
<td>Pontogeneia sp. A</td>
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<td>Photis vinogradova</td>
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<td>Pontoporeia femorata</td>
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<tr>
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<td>Paraphoxus oculatus</td>
<td>Ischyrocerus megalops</td>
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S = 23  
N = 197

S = 31  
N = 743

S = 38  
N = 826
Table 8. Dominant Amphipod Species Collected During OCS-2 and OCS-3 from PPB-70. $S = \text{Number of Species}; \ N = \text{Number of Specimens}$.

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<td>Podoceropsis inaequistylis</td>
<td>Podoceropsis lindhaldi</td>
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<td>Goesia depressa</td>
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<td>Protomedeia fasciata</td>
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<td>Ericthonius megalops</td>
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$S = 42$

$N = 1041$

$S = 37$

$N = 755$
VII. Discussion

A. Animal Densities and Biomass on the Pitt Point Transect.

Since samples have now been processed for the first four OCS field trips, it is possible to evaluate the degree to which benthic populations fluctuate throughout an annual cycle on the Pitt Point transect. Careful examination of Tables 2 and 3 reveals that at most stations the benthic infaunal populations seem very stable with rather similar values of animal abundance from season to season. There is little indication of any significant die-off of the benthos during the winter months. A few anomalous values in animal densities are recorded, particularly at the deeper stations taken during May, 1976. However, it is difficult to interpret whether these values are indicative of real seasonal trends, or if they are merely reflecting spatial rather than temporal variability. An additional series of benthic samples during the winter and spring months would go far toward elucidating the effects of seasonality on the benthos. Also, additional analysis of the existing samples at the species level may be helpful in interpreting the density values.

The biomass values (grams wet preserved weight) also exhibit no order of magnitude changes, indicative of a stable benthic populations through time.

B. Distribution of the Gammarid Amphipods on the Pitt Point Transect.

Careful examination of Tables 4-8 reveals several trends in the distribution of the dominant species of gammarid amphipods collected on the Pitt Point Transect during the three field trips. Station PPB-25 was characterized by low numbers of amphipods and low similarities of the dominant species when comparing the three collections. The four deeper stations (PPB-40, PPB-55, PPB-70 and PPB-100) have both larger numbers
of amphipods and much higher within station similarities. The variability at the inner shelf station probably reflects the much higher environmental heterogeneity found in this area due to the disturbances of ice impinging on the bottom. The data from the deeper stations suggests that these areas are sufficiently homogeneous that the same communities can be sampled repeatedly.

In comparing the amphipod faunas from the different depths, there seems to be clear evidence of depth zonation. Three amphipod assemblages seem to be identifiable by comparing the dominant species: 1) an inner shelf group found at PPB-25 and PPB-40; 2) a mid-shelf group found at PPB-55 and PPB-70; and 3) an outer-shelf fauna found at PPB-100. The validity of these three assemblages will be tested in the near future through the use of multivariate techniques such as cluster analysis.
Conclusions

The amount of data presently available make any conclusions rather tenuous, but there are a few significant trends in the data sets.

1) Benthic infaunal populations of the Beaufort Sea Continental Shelf show little evidence of strong seasonal fluctuations in abundance. In fact, temporal variability seems much less than spatial variability.

2) The gammarid amphipod fauna of the Beaufort Sea Continental Shelf shows clear depth zonation with a inner-, mid-, and outer-shelf assemblages being identifiable.
IX. Needs for Further Study

Present knowledge of the benthic ecosystem of the Beaufort Sea is still very much in the descriptive phase. There is a great need for future research if we are going to access and predict the impact of petroleum development in this area. In particular, there is a need to study the dynamic processes of the benthic ecosystem. Such studies should include a description of the benthic food web, and measurement of reproductive and repopulation rates of dominant species.
X. Summary of 4th Quarter Operations.

A. Ship and Laboratory Activities

1. Field Work

No field work has been undertaken this quarter. Plans have been initiated for a cruise on the USCGC GLACIER this summer to study the benthic components of the food web in the Beaufort Sea.

2. Laboratory Activities

a. Personnel

1. Andrew G. Carey, Jr.  Principal Investigator
   Associate Professor
   Responsibilities: coordination, evaluation, analysis, and reporting.

2. John J. Dickinson  Research Associate Postdoctoral
   Responsibilities: direction of laboratory personnel, gammarid amphipod systematics, sample processing, data compilation and analysis, and field collection.

3. R. Eugene Ruff  Research Assistant
   Responsibilities: species list compilation, reference museum curation, and field collection.

4. James B. Gish  Research Assistant
   Responsibilities: data management, statistical analysis, and field collection.

5. Paul Montagna  Research Assistant
   Responsibilities: sample processing, biomass, and Harpacticoid Copepod systematics.
b. Methods

The techniques for sample processing have not been altered this quarter.

c. Data analyzed

During this quarter, 40 Smith-McIntyre grabs have been processed including 15 samples from the Narwhal Island Transect and 25 samples from the Pitt Point Transect. These samples were sorted to phyla, and determinations of animal density and biomass have also been completed (see Tables 9-18). Fifty-five samples from OCS-5 and OCS-6 remain to be sorted to phyla.

The gammarid amphipods from OCS-2 and OCS-3 have been identified to species (see Tables 19-28).

B. Problems Encountered

No new problems have developed this quarter.

C. Estimate of Funds Expended. Contract No. 03-5-022-68 (FY76 + 77)

Task Order No. 5 R.U. #6.

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Table 10. Animal densities for NIB-55 (OCS-3) collected on 1 June 1976.

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| TOTAL            | 488  | 596  | 406  | 288  | 470  | 2248 |

33
Table 15. Animal densities for PPB-70 (OCS-4) collected on 31 August 1976.

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</table>

TOTAL                | 701  | 930  | 677  | 724  | 688  | 3720  |
Table 16. Animal densities for PPB-100 (OCS-4) collected on 30 August 1976.

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Table 17. Wet Weight in Grams of Major Groups, for NIB stations cruises OCS-3 and OCS-4.

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<th>Arthropoda</th>
<th>Mollusca</th>
<th>Ophiuroidea</th>
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* Weight biased by a large and rare organism, number in parenthesis is weight with bias excluded.
Table 18. Wet Weight in Grams of Major Groups, for PPB Stations Taken During Cruise OCS-4.

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<th>Polychaeta</th>
<th>Arthropoda</th>
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* Weight biased by a large and rare organism, number in parenthesis is weight with bias excluded.
Table 19. The Gammarid Amphipods from PPB-25 Collected During OCS-3. 13 Species were Reported in the 26 Specimens.

<table>
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<td>Ampelisca eschrichti</td>
<td>1</td>
<td>1/9</td>
<td>4</td>
</tr>
<tr>
<td>Byblis gaimardi</td>
<td>3</td>
<td>3/9</td>
<td>2</td>
</tr>
<tr>
<td>Haploops laevis</td>
<td>2</td>
<td>1/9</td>
<td>3</td>
</tr>
<tr>
<td>Haploops sibirica</td>
<td>1</td>
<td>1/9</td>
<td>4</td>
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<tr>
<td>Corophiidae</td>
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<td>Geosia depressa</td>
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<td>1/9</td>
<td>4</td>
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<td>Eusiridae</td>
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<tr>
<td>Rozinante fragilis</td>
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<td>1/9</td>
<td>4</td>
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<tr>
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<tr>
<td>Gammarus sp. AA</td>
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<td>Haustoriidae</td>
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<td>Onisimus littoralis</td>
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<td>4</td>
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<td>Oedicerotidae</td>
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<td></td>
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<tr>
<td>Aceroidea latipes</td>
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<tr>
<td>Phoxocephalidae</td>
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Table 20. The Gammarid Amphipods from PPB-40 Collected During OCS-3. 19 Species were Reported in the 42 Specimens.

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<td><strong>Byblis gaimardi</strong></td>
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<td>7</td>
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<tr>
<td><strong>Haploops tubicola</strong></td>
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<td>1/5</td>
<td>7</td>
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<td>Argissidae</td>
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<td><strong>Argissa hamatipes</strong></td>
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<td>7</td>
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<td>Corophiidae</td>
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Table 21. The Gammarid Amphipods from PPB-55 Collected During OCS-3. 34 Species were Represented in the 810 Specimens.

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<tr>
<td>Haploops setosa</td>
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<td>2/6</td>
<td>18</td>
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<td>Haploops sibirica</td>
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<tr>
<td>Lembos arcticus</td>
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Table 22. The Gammarid Amphipods from PPB-70 Collected During OCS-3.
37 Species were Represented in the 755 Specimens.

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<td><em>Haploops tubicola</em></td>
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Table 22. (cont.)

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Table 23. The Gammarid Amphipods from PPB-100 Collected During OCS-3.
38 Species were Represented in the 825 Specimens.

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Table 24. The Gammarid Amphipods From PPB-25 Collected During OCS-2. 10 Species Reported in the 35 Specimens.

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Table 25. The Gammarid Amphipods From PPB-40 Collected During OCS-2.  
15 Species were Represented in the 52 Specimens.

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34 Species were represented in the 547 Specimens.

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31 Species were represented in the 743 specimens.

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FINAL REPORT

Contract No. 03-5-022-68
Task Order No. 4
1 April 1975 - 31 March 1976

Summarization of existing literature and
unpublished data on the distribution, abundance,
and life histories of benthic organisms

Andrew G. Carey, Jr., Principal Investigator
School of Oceanography
Oregon State University
Corvallis, Oregon 97331

1 January 1977
The following document is the final report of Research Contract No. 03-5-022-68 (Task Order No. 4) completed by the Oregon State University Benthic Ecology Group for the National Oceanic and Atmospheric Administration under the auspices of the Bureau of Land Management. This final report is a summary of the present state of knowledge of the benthic ecology of the outer continental shelf of the Beaufort Sea. The report is divided into four volumes:

I. A narrative which summarizes the present state of knowledge of the structure and composition of benthic communities living on the Beaufort Sea continental shelf.

II. A list which summarizes from published and unpublished literature the benthic invertebrate species reported from the Beaufort Sea.

III. An atlas of distribution charts summarizing the distributions of selected benthic organisms reported by investigators recently active in the Beaufort Sea.

IV. An annotated bibliography summarizing the existing scientific literature on the Beaufort Sea benthos.

The total length of this final report is 789 pages.
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Quantitative benthic sampling has only recently been initiated across the Beaufort Sea continental shelf. Initial results outline a diverse benthic fauna occurring in overlapping bands which tend to follow the depth contours. Highs in biomass and numerical abundance are reported from the outer shelf below the area subject to impinging ice and dilution effects, and from the very shallow protected bays near the mouth of the Mackenzie River. Continued work is indicated to adequately describe the benthic fauna, and particularly the infaunal organisms smaller than 1.00 mm. Basic information is needed on the metabolism and reproductive rates of the bottom-dwelling invertebrates. An understanding of the dynamics of the benthic ecosystem is necessary to predict the ultimate impact of a developing petroleum industry in the region.
Section I. NARRATIVE

1. History of the Benthic Sampling in the Beaufort Sea

Until recently, few samples of the benthic fauna had been obtained from the Beaufort Sea. The lack of early extensive marine research in this area could be directly attributed to the great difficulties and expenses involved in sampling this ice dominated and relatively inaccessible portion of the Arctic Ocean. As a result, knowledge of the benthic community structure and species composition lagged far behind that of comparable northern areas such as the White Sea or the waters around Greenland. With the discovery and planned utilization of petroleum resources across the north Alaska coast, however, the need for additional intensive biological and oceanographic research has become readily apparent.

Benthic invertebrate samples were collected in the early 1880's by the U.S. Coast and Geodetic Survey schooner YUKON (1880), by the revenue steamer CORWIN (1884 and 1885), and by members of the International Polar Expedition to Point Barrow (1881-1883). These early qualitative samples yielded only a limited number of species of echinoderms, worms, crustaceans, and molluscs. The samples served as a guide to some of the more commonly encountered marine invertebrates, but did little to elucidate the ecology of the region.

The next major sampling effort occurred during the Canadian Arctic Expedition of 1913-1918. The southern party passed along the northern coast of Alaska en route to the Canadian Archipelago, and benthic samples were obtained along the Beaufort Sea continental shelf at intervals between Point Barrow and the Mackenzie River delta. These numerous col-
lections of marine organisms were forwarded to a number of taxonomic specialists who produced a series of reports printed by the Canadian government between the years 1919 and 1924. Volumes VII through IX of these reports recorded taxonomic descriptions with notes on natural history for arctic species representing the majority of the invertebrate phyla.

Little additional sampling was accomplished in the Beaufort Sea until the late 1940's, when Dr. G.E. MacGinitie initiated an extensive study to describe the benthic invertebrate fauna in the Point Barrow region (MacGinitie, 1955). Between 1948 and 1950, MacGinitie sampled during both summer and winter months using dredges as well as small bottom grabs and under-ice traps. Observations were made on the natural history of the benthic organisms, including notes on distribution, abundances and reproductive activity. These data, confined to the limited area around Point Barrow, have provided the only overview of the benthic processes available from the Alaskan arctic. Until very recently, these few observations have had to suffice for all ecological generalizations made across the entire Beaufort Sea.

Only sporadic benthic sampling was undertaken during the 1950's and 1960's. The CGMV CANCOLIN occupied a single station on the continental shelf in 1951-52. Trawl samples were obtained in Beaufort coastal waters in 1953 during a U.S. Coast and Geodetic Survey cruise aboard the LCM RED. Orange peel grab samples and beam trawl collections were taken by Neave in 1954 aboard the USCGC NORTHWIND as part of the Canadian-United States Beaufort Sea Expedition in 1954. Cruises by the Canadians on the M/V SALVELINUS and M/V CALANUS were used to sample extensively throughout
the Canadian arctic and several times into the Beaufort Sea (Curtis, 1975). The Fisheries Research Board of Canada conducted trawling surveys with the M/V SALVELINUS as far westward as Herschel Island near the U.S. -Canadian border. Most of these trawl hauls were at depths between 10 and 60 meters, although some were as deep as 200 meters (Squires, 1969).

The only collections of the benthos made at abyssal depths were taken from the U.S. ice stations Bravo and T-3 (George and Paul, 1970; Paul and Menzies, 1974). These samples were collected in the Alpha Cordillera region of the high arctic north of Ellesmere Island as the stations drifted in the Beaufort gyre. This area is beyond the generally described limits of the Beaufort Sea, but they provide data on components of the deep-sea fauna that can be expected to appear as sampling progresses into the deeper sectors of the Beaufort.

Recently, as a result of the petroleum discoveries along the Alaskan north slope, there has been a marked increase in the oceanographic investigations throughout the Beaufort Sea. The exploration and planned development of large oil and gas deposits have directly stimulated marine environmental research, including detailed work on benthic ecology and systematics. As the shelf waters of the Beaufort have become more and more accessible, investigators in both the U.S. and Canada have become engaged in describing the benthic ecosystem.

Extensive sampling of the benthic invertebrate fauna was initiated by Carey in 1971 and 1972 during the Western Beaufort Sea Ecological Cruises aboard the USCGC GLACIER (Carey, et al., 1974; Carey and Ruff, unpubl. ms.). Grab stations were occupied across the shelf and down the continental slope to depths exceeding 2000 meters between Cape Halkett and Barter Island.
Additional stations were occupied where open water conditions permitted the use of otter trawls from the icebreaker (Fig. 2). Near-shore benthic sampling surveys have been undertaken by several groups, especially in regions of immediate pollution concern. These areas have included the lagoons and barrier islands around the mouth of the Colville River sampled by the University of Alaska with otter and beam trawls (Crane and Cooney, 1974; Crane, 1974). Particular emphasis has been placed on the Prudhoe Bay area. Feder sampled in and around the bay using divers, traps, a Fager corer and an airlift system (Feder, Shaw, and Naidu, 1976). Woodward-Clyde Consultants have collected additional samples from the area adjacent to the ARCO causeway (personal communication, letter Nov. 8, 1976).

Research has also progressed in the Canadian sector of the Beaufort Sea. Beginning in 1971, the Canadian Dept. of the Environment has occupied stations throughout the Mackenzie River delta, the Eskimo Lakes region east of the Tuktoyaktuk Peninsula, and across much of the south-eastern continental shelf (Fig. 3). Quantitative benthic sampling under the direction of J.W. Wacasey has been accomplished at these stations from a variety of research vessels, and has included observations made from the research submersible PISCES IV (Wacasey, 1975).
Figure 1. Sampling stations occupied with a Smith-McIntyre grab in 1971 from the USCGC GLACIER
Figure 2. Otter trawl sampling locations occupied in 1971 and 1972 from the USCGC GLACIER.
Figure 3. Sampling stations occupied by J.W. Wacasey from small vessels and the research submersible PISCES IV.
2. Recent Work on Benthic Community Structure and Composition

Prior to 1971, benthic sampling in the Beaufort Sea was both sporadic and qualitative in nature. The information derived constituted a faunistic survey, and did little to elucidate the ecology of the region. With the initiation of more recent projects, however, investigators have begun to take a closer look at the community structure and composition of the benthos across the Beaufort.

In 1974, Feder examined the benthic infauna in the nearshore marine environment in Prudhoe Bay. Much of the area is covered with ice for a large part of the year, and no macrofaunal marine invertebrates were reported in the intertidal zone or within the beach sediments. In general, very low total benthic biomass was encountered, although the numbers of organisms, biomass, and species diversity did increase with increasing distances from shore. Feder suggested that the broad distribution of shallow invertebrate species along the Alaskan coast pointed toward a widely dispersed stock available for the immediate repopulation of ice stressed areas.

Carey sampled across the Beaufort Sea continental shelf using trawls and a quantitative grab sampler in depths as shallow as 20 meters. Results from grabs taken in 1971 between Cape Halkett and Barter Island indicated high numbers of benthic infaunal organisms on the outer portion of the continental shelf and over the shelf break (Table 1). These values were comparable with other arctic and subarctic regions. Both biomass and numbers of organisms dropped to low values further down the continental slope, and were also depressed in the shallowest shelf stations, suggesting the possible destructive effects of grounding ice floes.
Table 1. Average numerical densities and biomass reported for the benthic macro-infauna in the southwestern Beaufort Sea at stations occupied by Carey in 1971. All invertebrates retained on a 1.00 mm sieve are included with the exception of single organisms weighing more than 5.0 grams. Biomass is recorded as wet preserved weight, and includes shells and worm tubes.

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Results from trawls taken by Carey in 1971 and 1972 indicated that many of the larger epifaunal organisms were found in depth zones which occurred in bands with overlapping distributions across the shelf. Possible correlations with environmental parameters were suggested, including the fresh water or food input from rivers, effects of oceanic water masses, and the local substrate encountered.

Benthic studies have also been conducted in the south eastern portion of the Beaufort Sea since 1971. Results reported by Wacasey from stations ranging from 1 to 400 meters (Table 2) have indicated that the area can be divided into four distinct areas:

- **Estuarine zone** - characterized by lowered nutrient values and unstable temperature and salinity conditions. This nearshore region is greatly influenced by the freshwater runoff from coastal rivers.

- **Transitional zone** - exhibits smaller temperature and salinity fluctuations, but is the area of most intense ice scour.

- **Marine zone** - occupies the outer portion of the continental shelf, and is a region with much more stable conditions.

- **Continental slope zone** - occurs beyond the shelf break and down the slope. This zone is defined by the presence of benthic species that are rare or absent from the shallower water. The depth of this zone was not determined, but it may coincide with the intermediate layer of Atlantic water encountered between 200 and 900 meters.

Comparison of benthic infauna data obtained by Carey and Feder in the western Beaufort and Wacasey in the southeastern sector reveals an overall similarity in trends of numerical abundance and biomass (Figs. 4-7). Wacasey reports very low species diversity and a total biomass averaging less than 2g/m² from depths less than 15 meters. Although Carey did not sample in this shallow zone, these results are in good agreement with the values obtained by Feder in Prudhoe Bay at similar depths. Both investigators noted that the values tended to increase with increasing depth and
Table 2. Average numerical densities and biomass reported for the benthic invertebrates in the southeastern Beaufort Sea at stations sampled by Wacasey between 1971 and 1975. Abundance figures include all organisms larger than 0.50 mm. Biomass is reported as dry organic weight excluding tubes and calcareous shells.

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Figure 4. Numerical abundance of the benthic infaunal organisms found at stations occupied on the Beaufort Sea continental shelf and slope by Carey in 1971, and in Prudhoe Bay by Feder in 1974. All invertebrates retained on a 1.00 mm mesh sieve are reported.
Figure 5. Biomass of the benthic infaunal organisms found at stations occupied across the continental shelf and slope by Carey in 1971, and in Prudhoe Bay by Feder in 1974. Values reported by Carey in grams/m² wet preserved weight, and include tubes, shells, and other hard parts, but exclude the rare, single organisms weighing more than 5.00 g.
Figure 6. Numerical abundance of the benthic invertebrates occurring at stations near the Mackenzie River delta occupied by Wacasey between 1971 and 1975. All organisms larger than 0.50 mm are included.
Figure 7. Biomass of the benthic invertebrates occurring at stations near the Mackenzie River delta occupied by Wacasey between 1971 and 1975. Values are reported in grams/m² dry organic weight excluding shells and worm tubes.
distance from shore. Wacasey also noted very high density and biomass values in the shallow bays and lakes around the Mackenzie River mouth. These results may reflect local nutrient enrichment, or the benthic community may be responding to the relatively stable conditions encountered in these protected water.

Higher values for total biomass and species diversity, and increased numerical abundance were recorded from the continental shelf in depths from 15 to 20 meters. Wacasey suggested that ice scour in this region may remove a significant portion of the substrate from production, thus depressing the productivity below values found further out on the shelf. Carey also inferred the destructive influence of grounding ice, and noted lowered values for both biomass and numerical density at comparable depths.

The highest values for total benthic biomass, numerical abundance and species diversity have been reported from the outer regions of the continental shelf, corresponding to Wacasey's Marine Zone. Carey, however, also recorded high numerical densities beyond the shelf break to depths of 700 meters on the upper slope west of Prudhoe Bay. Nutrient input coupled with the lack of ice disruption has been postulated to explain the relatively high values encountered in this deeper region. Beyond this, both investigators have found that numbers and biomass decrease to low levels at stations further down the continental slope.

Although there is agreement in the trends reported by recent benthic investigators, the results cannot be compared directly. It should be noted that there is no standardization of oceanographic techniques, and that each investigator has his own methodology. For example, Feder, Carey
and Wacasey all used different sampling equipment which took differing areas and volumes of the bottom sediments. Wacasey sieved the sediments through a 0.50 mm screen and subsequently examined all of the retained organisms. Carey initially washed the sediments through a 0.42 mm sieve, but he only identified and counted the invertebrates from the fraction larger than 1.00 mm. Wacasey reported dry organic weight for all organisms exclusive of worm tubes and mollusc shells. Carey measured preserved wet weight including tubes and shells, but excluding the occasional rare, large organism which would significantly bias the data from a particular station. From this it can be seen that direct comparison of the data derived from these recent studies is not feasible, and all information on the benthic community structure and composition in the Beaufort Sea must be examined relative to the methods and techniques employed by the observer.
3. Analysis of WEBSEC samples

Part of the research effort supported by the NOAA/BLM contract involved further analysis of samples collected by the O.S.U. Benthic Ecology Group during the Western Beaufort Sea Ecological Cruise in 1971. This work included:

a. the identification of the harpacticoid copepods from the WEBSEC-71 grabs samples
b. the picking and sorting of selected meiofaunal samples
c. a cluster analysis of the available species data from the WEBSEC-71 grab samples.

a. Harpacticoida (Crustacea, Copepoda)

The harpacticoid copepods collected during the WEBSEC-71 cruise aboard the USCGC GLACIER have been examined and identified (Table 3). These animals are from the macro-infauna fraction (1.00 mm and larger) of the Smith-McIntyre grab samples. A total of 356 animals were found in 71 of 199 grabs taken. It is expected that if the larger meiofauna fraction (between 0.42 and 1.00 mm) is completely picked and sorted, the number of harpacticoids found will increase by as much as ten fold.

The harpacticoid fauna of the Beaufort Sea is not well known. The only reported specimens from the Beaufort Sea were taken during the Canadian Arctic Expedition of 1913-18 (Willey, 1920). Consequently, of the 17 species found, 7 were unidentifiable. Of these it is likely the unknown genera of Cerviniidae and D'Arcythompsoniidae are new to science, as are the unknown species of Bradya and Halectinosoma. The unknown female from the Diosaccidae cannot be identified without a companion male.
Table 3. Harpacticoid copepods examined from grab samples taken across the southwestern Beaufort Sea continental shelf in 1971 between Cape Halkett and Barter Island. Station numbers refer to locations indicated in Figure 1.

<table>
<thead>
<tr>
<th>Identification</th>
<th>Total</th>
<th>Found at Stations:</th>
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<tbody>
<tr>
<td><strong>Cerviniidae</strong></td>
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<tr>
<td><em>Cervinia bradya</em> Norman, 1878</td>
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<tr>
<td><em>Cervinia synartha</em> Sars, 1903</td>
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<tr>
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</tr>
<tr>
<td><strong>Ectinosomadae</strong></td>
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<td></td>
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<tr>
<td><em>Bradya confluens</em> Lang, 1936</td>
<td>3</td>
<td>08, 30</td>
</tr>
<tr>
<td><em>Bradya unknown species 'B'</em></td>
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<td>44, 61, 76</td>
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<tr>
<td><em>Halectinosoma unknown species 'C'</em></td>
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<td><strong>Harpacticidae</strong></td>
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<tr>
<td><em>Harpacticus superflexus</em> Willey, 1920</td>
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<tr>
<td><strong>D'Arcythompsoniidae</strong></td>
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<tr>
<td><em>Paramphiascospis giesbrechtii</em> (Sars, 1910)</td>
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<td>19, 30, 42, 61</td>
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<td><em>Paramphiascospis longirostris</em> (Claus, 1863)</td>
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<td>03, 19</td>
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<tr>
<td><em>Typhlamphiascus confusus</em> (T. Scott, 1902)</td>
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<tr>
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<tr>
<td><em>Amphiascodes unknown species 'F'</em></td>
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<td>Unknown species 'G'</td>
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<td><strong>Cletodidae</strong></td>
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<tr>
<td><em>Argestes mollis</em> Sars, 1902</td>
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<td>30, 42, 60, 61</td>
</tr>
<tr>
<td><em>Paranannopus echinatus</em> Smirnov, 1946</td>
<td>35</td>
<td>29, 30, 42, 61, 75, 76, 82</td>
</tr>
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</table>
Harpacticus superflexus comprised 52% of all organisms found, and it's distribution also covered the broadest range in area (see distribution charts). H. superflexus is predominately a shallow water form, and 54% of them were found in depths surrounding 25 meters. Their abundance decreased with an increasing depth: 34% were found at depths of 50 meters, and none were found deeper than 125 meters.

The second most abundant group belonged to an unknown genus from the family Cerviniidae. All three species belonging to this family were morphologically similar. The distribution pattern of Cervinia synarthra and the unidentified species are similar to one another, but the range of the unknown species does extend further to the east. They are both most abundant at 50 meters. Whereas C. Synarthra does not occur deeper than 130 meters, 20% of the unknown species numbers were found between depths of 125-150 meters. C. bradya occurred at 90 and 1100 meters.

Paranannopus echinatus comprised 10% of all organisms found. Though this species did occur at 50 and 430 meters, 60% of them came from depths between 95-140 meters.

The unknown specimen of the family D'Arcthompsoniidae was the only exclusively deep water form, and was found at depths of 360, 750, and 930 meters.

Some community distribution patterns seem apparent by comparing the species distribution charts. H. superflexus and the unknown species of Cerviniidae show very similar distributions. They both cover the full range of the study area, and are found in shallow water near the barrier islands off Prudhoe Bay. C. synarthra seems to share this broad range of distribution except that it is not found near the barrier islands.
Argestes mollis, Paramphiascopsis giesbrechti and Paranannopus echinatus all occur in a similar narrow range located slightly east of the Colville River delta, and in deeper water.

b. Benthic Meiofauna

Samples taken with a 0.1 m² Smith-McIntyre grab during the WEBSEC-71 cruise aboard the USCGC GLACIER were separated into two fractions - the macro-infauna (those organisms caught on a 1.00 mm sieve), and the larger meiofauna (those organisms which pass through the 1.00 screen but which are retained on a 0.42 mm sieve). All the macro-infauna sampled have been sorted and many of the invertebrates have been identified to provide a picture of the benthic infaunal community. Recently, processing of the meiofauna fraction has been initiated on samples taken near Prudhoe Bay. This area was selected since it is of particular interest in terms of assessing the benthic community structure and monitoring the possible ramifications of oil pollution. Six samples have been sorted, including three from station CG 29 (338 meters depth), and three from station CG 30 at 100 meters depth (Table 4).

The number of organisms recorded from the meiofauna fraction (0.42 - 1.00 mm) is higher than the counts derived from all of the larger organisms (>1.00 mm) found in the sample (Table 5). Adding the meiofauna counts to the totals reported for the benthic macro-infauna results in a 269% increase at the shallower location. This large increase in animal density is due to the addition of numerous individuals from a few specific groups, including the nematodes, annelids, and selected classes from the phylum Arthropoda. The number of nematodes increased dramatically to 309% of
Table 4. Animal densities in the meiofauna fraction (0.42 - 1.00 mm) of grab samples taken in 1971 near Prudhoe Bay. A '+' indicates presence, although no counts of the particular organism were made.

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<td>Bryozoa</td>
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<td>++</td>
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<td>Totals</td>
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Table 5. Comparison of the total animal densities recorded from the macrofaunal (>1.00 mm) and meiofaunal (0.42 – 1.00 mm) fractions of the grabs taken off Prudhoe Bay in 1971.

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<td>Annelida: Polychaeta</td>
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<tr>
<td>Arthropoda: Crustacea: Amphipoda</td>
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<td>24</td>
<td>69</td>
</tr>
<tr>
<td>Aplacophora</td>
<td>1</td>
<td>---</td>
</tr>
<tr>
<td>Gastropoda</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Polyplacophora</td>
<td>3</td>
<td>---</td>
</tr>
<tr>
<td>Brachiopoda</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Echinodermata: Ophiuroidea</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Asteroidea</td>
<td>1</td>
<td>---</td>
</tr>
<tr>
<td>Total</td>
<td>903</td>
<td>1528</td>
</tr>
</tbody>
</table>
the total number reported from the macro-infaunal fraction alone. Poly-
chaete worm and pelecypod mollusc counts also showed an increase. Three
groups of arthropods were significantly affected: harpacticoid copepod
counts rose 333%, tanaids increased 298%, and ostracod counts rose to a
level 417% above the total reported from the larger size fraction.

The examination of the meiofauna has demonstrated that the aperature
of the sieve used during sample washing will have a substantial effect on
the estimates of standing stock, and that total community composition will
change significantly with the addition of this smaller fraction (Table 6).
Since there is no standardization of sampling methodology, conclusions
concerning benthic community structure or species composition must be
interpreted in view of the sieve size used to screen the fauna. Although
there is probably a negligible effect on the total biomass per square meter
of ocean bottom, the total numerical density may double or triple as the
smaller animals are included. Meiofaunal energy turnover rates are higher
than the corresponding rates for the larger organisms. Consequently, the
meiofauna contribute substantially to the total energy flow in the eco-
system, and are an integral part of the benthic community. Much additional
work is required on the meiofaunal component to gain a better understanding
of the functioning of the benthos in the arctic environment.

c. Cluster Analysis - Southwestern Beaufort Sea Infauna

A total of 158 benthic species were examined for analysis from 191
grabs taken at 40 stations in the southwestern Beaufort Sea (Fig. 8). A
species was included in the final analysis if it was found in a minimum
of 10% of these grab samples. This criterion was satisfied by 30 species,
Table 6. Benthic infauna community composition by major taxonomic group expressed first separately for the macrofaunal (>1.00 mm) and meiofaunal (0.42 – 1.00 mm) components, and then for the combination of these two fractions.

<table>
<thead>
<tr>
<th>Taxonomic Group</th>
<th>Station CG 29 338 meters</th>
<th>Station CG 30 100 meters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Macrofauna</td>
<td>Meiofauna</td>
</tr>
<tr>
<td>Nematoda</td>
<td>40%</td>
<td>69%</td>
</tr>
<tr>
<td>Polychaeta</td>
<td>50%</td>
<td>20%</td>
</tr>
<tr>
<td>Crustacea</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Mollusca</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Others</td>
<td>2%</td>
<td>--</td>
</tr>
</tbody>
</table>
Figure 8. Stations occupied by Carey in 1971 which were examined for the cluster analysis. Open circles represent stations which were excluded from the final data matrix.
including 12 gammarid amphipods, 11 cumaceans and 7 pelecypods (Table 7). In spite of this reduction no stations were eliminated, although the species richness at some stations was substantially reduced. A station-species matrix was generated in the second step by averaging the species counts of any replicate grabs taken at a station. The third step imposed a limit on the species richness for any station in the matrix, and a station was dropped from the analysis if it had less than 9 species present. Thirteen stations did not meet this requirement. Of these 13 stations, 11 were at depths greater than 200 meters and the remaining two were less than 30 meters. The resulting station-species matrix contained 27 stations (rows) and 30 species (columns) from which the analysis below was performed. The similarity index SIMI (Stander, 1970) was calculated for all stations and species. A matrix of these indices was then clustered using a complete linkage algorithm (Sneath and Sokal, 1973), and phenograms were generated to visually present the results of the clustering techniques (Figs. 9 and 10). SIMI is a similarity measure between two attribute vectors, X and Y. These can be defined as a station vector having elements which represent the abundance of all species at that station, and a species vector having elements which represent the abundance of the particular species at all stations. This index was chosen for its conservative properties when rare organisms are added to the analysis, and for the fact that it operates independent of absolute magnitudes, responding only to proportional changes in composition.

\[
SIMI = \frac{\Sigma xi^2 + \Sigma yi^2 - \Sigma (xi - yi)^2}{2\sqrt{\Sigma xi^2 \, \Sigma yi^2}}
\]
Table 7. Benthic invertebrate species included in the cluster analysis.

Phylum Arthropoda:

Amphipoda—

Aceroides latipes (Sars, 1892)  
Ampelisca eschrichtii Kroyer, 1842  
Anonyx nugax (Phipps, 1774)  
Bathymeridion obtusifrons (Hansen, 1887)  
Byblis gaimardi (Kroyer, 1846)  
Haploprela laevis Hoek, 1882  
Haploprela tubicola Liljeborg, 1855  
Paraphoxus oculatus G. Sars, 1879  
Photis reinhardii Kroyer, 1842  
Protomeda fasciata Kroyer, 1842  
Protomeda grandimana Bruggen, 1905  
Unciola leucopsis (Kroyer, 1845)

Cumacea—

Brachydiastylis nimia Hansen, 1920  
Cumella carinata (Hansen, 1887)  
Diastylis edwardsi (Kroyer, 1841)  
Diastylis goodsiri (Bell, 1855)  
Diastylis oxyrrhyncha Zimmer, 1926  
Diastylis scorioides (Lepechin, 1780)  
Eudorella emarginata (Kroyer, 1846)  
Leucon acutirostris G. Sars, 1865  
Leucon nasica (Kroyer, 1841)  
Leucon nasicoides Liljeborg, 1855  
Diastylis rathkei (Kroyer, 1841)

Phylum Mollusca

Pelecypoda—

Astarte montagui (Dillwyn, 1817)  
Cyclopecten greenlandicus (Sowerby, 1842)  
Nucula belloti Adams, 1856  
Nuculana pernula (Muller, 1779)  
Portlandia arctica (Gray, 1824)  
Portlandia frigida (Torell, 1859)  
Portlandia lenticula (Moller, 1842)
Figure 9. Station phenogram generated by a complete linkage (farthest neighbor) classification algorithm using SIMI for the similarity matrix. Groups 'A' through 'D' are indicated.
Figure 10. Species phenogram generated by a complete linkage (Farthest neighbor) classification algorithm using SIMI for the similarity matrix. Groups I through V are indicated.
Station groupings -

Four groups of stations, labeled 'A' through 'D', were generated by the clustering procedure with a convergence level for SIMI placed at less than 0.2 (Table 8). In general, these groups occur in bands with east-west axes, and are distributed with depth across the continental shelf as a nearshore group ('B'), and a midshelf group ('A'), with an intermediate group ('C') in between. Group 'D' is confined to the western portion of the study area and appears analogus to group 'A'. An additional group is formed of the deeper stations down the continental slope which were excluded from the analysis (Fig. 11).

Station group 'A' consists of 12 sites with depths ranging between 33 and 142 meters. This group extends from approximately 150° west longitude to the eastern margin of the study area. Group 'B' is made up of seven nearshore stations shallower than 40 meters and in the central portion of the study area. The 'C' station group has representatives over the entire width of the study region, and confined within a narrow depth band (44-49 meters) with the exception of a single station (CG 05) off Barter Island at 106 meters depth. Finally, group 'D' is restricted to the area close to the Colville River, although it does overlap slightly with the 'A' group. The depth of the stations in this final group varies between 47 and 136 meters, comparable to the range of group 'A'.

Some additional subjective information can be inferred from the stations which were excluded from the cluster analysis by the imposition of specific limitations. Eleven of these stations occurred down the continental slope, indicating that the elimination of the rare species and the lower limit on the species richness of a station has neatly sorted out
Table 8. Benthic sampling stations on the southwestern Beaufort Sea continental shelf which tend to group together using a statistical clustering technique.

<table>
<thead>
<tr>
<th>Station</th>
<th>Depth (Meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 'A'</td>
<td></td>
</tr>
<tr>
<td>CG 01</td>
<td>33</td>
</tr>
<tr>
<td>CG 03</td>
<td>48</td>
</tr>
<tr>
<td>CG 08</td>
<td>84</td>
</tr>
<tr>
<td>CG 09</td>
<td>57</td>
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<td>CG 17</td>
<td>46</td>
</tr>
<tr>
<td>CG 18</td>
<td>146</td>
</tr>
<tr>
<td>CG 27</td>
<td>50</td>
</tr>
<tr>
<td>CG 28</td>
<td>107</td>
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<tr>
<td>CG 30</td>
<td>100</td>
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<td>CG 31</td>
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<td>CG 42</td>
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<td>CG 61</td>
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<td>Group 'B'</td>
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</tr>
<tr>
<td>CG 12</td>
<td>26</td>
</tr>
<tr>
<td>CG 14</td>
<td>27</td>
</tr>
<tr>
<td>CG 23</td>
<td>27</td>
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<tr>
<td>CG 25</td>
<td>26</td>
</tr>
<tr>
<td>CG 48</td>
<td>25</td>
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<tr>
<td>CG 63</td>
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<tr>
<td>CG 80</td>
<td>30</td>
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<tr>
<td>Group 'C'</td>
<td></td>
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<tr>
<td>CG 05</td>
<td>106</td>
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<td>CG 44</td>
<td>47</td>
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<td>CG 72</td>
<td>45</td>
</tr>
<tr>
<td>CG 82</td>
<td>44</td>
</tr>
<tr>
<td>Group 'D'</td>
<td></td>
</tr>
<tr>
<td>CG 60</td>
<td>64</td>
</tr>
<tr>
<td>CG 74</td>
<td>101</td>
</tr>
<tr>
<td>CG 75</td>
<td>135</td>
</tr>
<tr>
<td>CG 76</td>
<td>47</td>
</tr>
</tbody>
</table>
Figure 11. Distribution of the stations grouped in a cluster analysis across the shelf. Dots represent stations which were excluded from the analysis.
the deeper stations. The two other stations excluded from the final data matrix were shallow locations near the Colville River in the same area where 'A' station grouping has been replaced by the 'D' group. Further sampling is needed to elucidate the biological processes occurring in this area. Additional sampling is also indicated at the eastern boundary of the study area around Barter Island where no nearshore station group was encountered and where a station in group 'C' was found 50 meters deeper than all similar stations to the west.

Species groupings -

The same species-station data matrix employed to group the stations was used to cluster the 30 benthic invertebrate species. Five species groups were found using a convergence level of 0.1 for the similarity index SIMI (Table 9). The benthic organisms representing species group I are cosmopolitan, although these species are more commonly found at the deeper stations and in the area around the Colville River. The species in group II are also found at the deeper stations, and they rarely occur in the shallower waters or in the Colville area. Organisms represented in species group III are found at most stations east of 150° west longitude. These species have a broad depth range, but they tend to be absent from the Colville River area. The species constituting group IV are part of a shallow water fauna which becomes very rare or disappears from the deeper stations, and which is also rarely encountered near the Colville. And finally, the species of group V are found consistently at stations off the Colville, but never occur in the nearshore waters represented by station group 'B'. 
Table 9. Benthic invertebrate species from the southwestern Beaufort Sea continental shelf which tend to group together using a statistical clustering technique.

<table>
<thead>
<tr>
<th>Group I</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ampelisca eschrichti</em></td>
<td></td>
</tr>
<tr>
<td><em>Haploops laevis</em></td>
<td></td>
</tr>
<tr>
<td><em>Photis reinhardi</em></td>
<td></td>
</tr>
<tr>
<td><em>Protomeida grandimana</em></td>
<td></td>
</tr>
<tr>
<td><em>Anonyx nugax</em></td>
<td></td>
</tr>
<tr>
<td><em>Brachydiastylis nimia</em></td>
<td></td>
</tr>
<tr>
<td><em>Diastylis oxyrhyncha</em></td>
<td></td>
</tr>
<tr>
<td><em>Eudorella emarginata</em></td>
<td></td>
</tr>
<tr>
<td><em>Leucon acutirostris</em></td>
<td></td>
</tr>
<tr>
<td><em>Leucon nasica</em></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Byblis gaimardi</em></td>
<td></td>
</tr>
<tr>
<td><em>Paraphoxus oculatus</em></td>
<td></td>
</tr>
<tr>
<td><em>Diastylis goodsiri</em></td>
<td></td>
</tr>
<tr>
<td><em>Diastylis scorpioides</em></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group III</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aceroides latipes</em></td>
<td></td>
</tr>
<tr>
<td><em>Diastylis rathkei</em></td>
<td></td>
</tr>
<tr>
<td><em>Portlandia frigida</em></td>
<td></td>
</tr>
<tr>
<td><em>Nuculana pernula</em></td>
<td></td>
</tr>
<tr>
<td><em>Astarte montagui</em></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group IV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Haploops tubicola</em></td>
<td></td>
</tr>
<tr>
<td><em>Protomeida fasciata</em></td>
<td></td>
</tr>
<tr>
<td><em>Diastylis edwardsi</em></td>
<td></td>
</tr>
<tr>
<td><em>Portlandia arctica</em></td>
<td></td>
</tr>
<tr>
<td><em>Portlandia lenticula</em></td>
<td></td>
</tr>
<tr>
<td><em>Nucula bellotii</em></td>
<td></td>
</tr>
<tr>
<td><em>Cyclopecten greenlandicus</em></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group V</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Unciola leucopsis</em></td>
<td></td>
</tr>
<tr>
<td><em>Bathymedon obtusifrons</em></td>
<td></td>
</tr>
<tr>
<td><em>Leucon nasicoides</em></td>
<td></td>
</tr>
<tr>
<td><em>Cumella carinata</em></td>
<td></td>
</tr>
</tbody>
</table>
The species groupings indicate that the southwestern continental shelf can be divided into a western area of interest off the Colville River, and an eastern region. The only species found with any regularity near the Colville River were those cosmopolitan species in group I and the organisms of group V. To the east, the region is again divisible into shallower and deeper benthic fauna. Representatives of species groups III and IV are found in the nearshore area, but species in group V are completely absent. The stations on the deeper shelf have a more cosmopolitan composition, and include representatives from groups I, II, III, and V.
4. Relevance to Problems Associated with Petroleum Development

Extensive drilling for oil and gas on the Alaskan and Canadian north slope has the potential to significantly influence the marine environment across the Beaufort Sea continental shelf. It is impossible with our present state of knowledge to accurately predict either the short or long term consequences of petroleum development on the marine benthos. Comprehensive descriptive studies of the benthic fauna in the Beaufort have only been initiated in the last few years. These studies are a necessary first step in providing a baseline from which any future changes in the benthic environment and community structure can be evaluated.

To date, little is known about the dynamics of the benthic ecosystem in the Beaufort Sea. There have been no studies on the dynamics of the benthic populations in this region. No reliable estimates of natural mortality are available, and recruitment rates remain unknown. Little research has been done on the metabolism and growth rates of these organisms living under ice for a large part of the year. Lacking this information it is very difficult to predict how quickly benthic populations could recover from an extinction event caused by a large-scale oil spill or by other industry-related pollution.

The benthic invertebrates constitute a major source of food for the top level carnivores, including birds, seals, and occasional walrus. Any decrease in benthic populations caused by oil pollution might eventually be reflected in the populations of these larger animals. Nearshore areas would seem to be the most sensitive since it would be in these regions that pollutants would be most likely to mix to the benthic boundary.
The timing of environmental disturbances in this strongly seasonal environment may be extremely critical in determining the stresses experienced by the benthic community. For example, an oil spill in the winter on top of the pack ice could be cleaned up with little or no resultant damage to the marine benthos, while a spill of the same magnitude during a summer of open water might have significant impact. It remains to be determined if the bottom-dwelling invertebrates are more or less sensitive to oil related pollution during the summer months, but the pelagic larvae of the benthic organisms would be vulnerable to spills during periods of open water conditions.

It seems likely that the development of the oil and gas resources will bring about changes in the marine environment, but the extent of degradation in the benthic environment cannot be predicted. There remains a great scientific need for long term studies on the dynamics of the benthic populations, including year round sampling with measurements on growth, metabolism, and reproductive activity.
5. Summary and Conclusions

Due to its remoteness and relatively harsh seasonal conditions, little biological sampling has been accomplished in the Beaufort Sea in the past. Benthic sampling lagged far behind comparable arctic areas, and quantitative work did not begin up until the present decade. In 1971, detailed investigations were launched by both the U.S. and Canada across the Beaufort Sea continental shelf and in the nearshore areas. Specific areas of interest included the Colville River delta, Prudhoe Bay, and the region around the Mackenzie River.

Results of these initial quantitative studies have outlined the general structure of the benthic community across the shelf. Maxima in both biomass and numerical abundance occur on the outer shelf or down the continental slope. Depressed values are found on the inner shelf, pointing to the possible effects of dilution caused by summer river runoff and the destructive influence of ice in the winter. Local highs in density and biomass occur in the very shallow embayments around the Mackenzie River where there may be higher inputs of food and where the organisms are not disrupted or destroyed by impinging ice.

Since oceanographic techniques of sample collecting and processing differ among various investigators, direct comparison of the data derived from the benthic community is not legitimate. The general trends in the data from separate studies can be compared, however. Information from the grabs taken along the southwestern shelf show that groups of invertebrate species tend to cluster into bands which roughly parallel the coastline. Similar bands are described from the southeastern sector around the Mackenzie River delta. It remains to be seen if the species composition
within these bands is the same for these two areas. Anomalous regions are indicated around the Colville River and Barter Island where differences appear in the structure of the benthic community, and along the eastern margin of the Beaufort Sea where high biomass values are found. Further study is required to clarify the processes occurring in these regions.

Much additional work needs to be done on existing samples before the benthic community is adequately described. Initial analysis of the meiofaunal fraction from several of the grab samples taken in 1971 has demonstrated the existence of large numbers of organisms which play a significant role in the dynamics of the benthic environment. Careful examination of the harpacticoid copepods from this fraction has shown that nearly half of the species are new to science. Similar results can be anticipated from the other major meiofaunal groups, emphasizing the need for much additional careful descriptive work. The necessary sorting of these large numbers of invertebrates from bottom sediments must be recognized as a tedious and time-consuming process, however.

In general, continued study of the benthic community is needed across the Beaufort Sea continental shelf. Information is required on the growth, metabolism, reproductive rates, recruitment, and mortality of the benthic organisms. Stations must be occupied at different times during the year to assess the responses of the invertebrates to an environment which is ice covered for nearly nine months. Accurate data on these aspects must be determined before the ultimate effects of oil related pollution on the benthic community can be meaningfully predicted.
6. Select References

The majority of the works referenced in this narrative can be found in the Annotated Bibliography in Volume IV, Part B. The few additional references not occurring in the bibliography are listed below.


FINAL REPORT

Contract No. 03-5-022-68
Task Order No. 4
1 April 1975 - 31 March 1976

Summarization of existing literature and unpublished data on the distribution, abundance, and life histories of benthic organisms

Andrew G. Carey, Jr., Principal Investigator
School of Oceanography
Oregon State University
Corvallis, Oregon 97331

1 January 1977
<table>
<thead>
<tr>
<th>Invertebrate</th>
<th>Page</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>Sipunculida</td>
<td>52</td>
</tr>
</tbody>
</table>
SPECIES LIST

The following list of 1083 species names comprises the benthic invertebrate organisms reported from the Beaufort Sea from sea level down to 3000+ meters.

Traditionally, the boundaries of the Beaufort Sea have been regarded as Point Barrow on the west and the edge of the Canadian Archipelago on the east. These limits have been expanded slightly for the purposes of this species list to include the most westerly regions of the Canadian Islands as well as the area west of Point Barrow adjacent to the Naval Arctic Research Laboratory. In addition, the benthic invertebrates collected from the ice island T-3 as it drifted north of Alaska in the Beaufort gyre have been included. It is expected that all of the species reported from these adjacent regions will also be encountered in the Beaufort Sea proper as more sampling is accomplished.

The majority of the benthic species listed are derived from current investigations, or were reported in publications which stemmed from the following works:

- Point Barrow Expedition (1885)
- Canadian Arctic Expedition (1913-1916)
- Collections by George MacGinitie at the Naval Arctic Research Laboratory (1948-1950)
- Ice Island collections in the Beaufort Gyre (1963, 1974)
- Colville River delta investigations (1970-1971)
Current investigations of the Beaufort Sea biota include work by:

Dr. A.G. Carey, Jr., Oregon State University  
-western Beaufort Sea between Point Barrow and Barter Island

Dr. H.M. Feder, University of Alaska  
-area in and around Prudhoe Bay

Dr. J.W. Wacasey, Dept. of the Environment, Canada  
-southeastern Beaufort Sea from Herschel Island to the Tuktoyaktuk Peninsula.

Many of the invertebrate organisms from areas within or adjacent to the Beaufort Sea have been examined in detail. Students interested in particular animal groups should consult the bibliographic index for a list of pertinent literature. The abbreviated index below includes some of the major works for many of the invertebrates:

Annelida - Polychaeta  
Berkeley and Berkeley, 1956  
Pettibone, 1954  
Reish, 1965

Arthropoda - Amphipoda  
Castillo, 1975  
Laubitz, 1972  
Shoemaker, 1955

Arthropoda - Cumacea  
Castillo, 1975  
Given, 1965

Arthropoda - Decapoda  
Squires, 1969

Arthropoda - Isopoda and Tanaidacea  
Bray, 1962  
Gur'ianova, 1934d  
Menzies and Mohr, 1962

Arthropoda - Ostracoda  
Jones, 1960  
Joy, 1974
Arthropoda - Pycnogonida
Hedgpeth, 1963

Bryozoa
Osburn, 1955

Cnidaria
Calder, 1970
Calder, 1972

Echinodermata - Asteroidea
Grainger, 1964
Grainger, 1966a

Echinodermata - Holothuroidea
Agatep, 1967

Mollusca - Gastropoda
Clark, 1963
MacGinitie, 1959
Macpherson, 1971

Mollusca - Pelecypoda
Clark, 1963
Lubinsky, 1972
MacGinitie, 1959

Nemertinea
Coe, 1952

Porifera
de Laubenfels, 1953

Protozoa - Foraminiferida
Loeblich and Tappan, 1953

Benthic organisms representing fifteen phyla are included within the species list. As an aid in locating any particular animal, the phyla are arranged in alphabetical order, and the generic names are listed alphabetically within each phylum. Many of the species names are preceeded with an asterisk to emphasize those organisms which have been reported by the investigators currently working in the Beaufort Sea. A number of these
species also have distributional data included in the next section, and these have been indicated with the letter "C" preceding the asterisk.
ARCTIC SPECIES LIST

PHYLUM ANNELIDA

HIRUINEA

CRANGONOBCELLA MURMANICA SELENYSK, 1914
OXYTONOSTOMA ARCTICA JOHANSSON, 1898
OXYTONOSTOMA TYPICA MALM, 1863
FLATYBDCELLA ANARRHICHA (DIESING, 1859)
## Arctic Species List

### Phylum Annelida

#### Polychaeta

| C * | Aglaophamus Malmgreni (Theel, 1879) |
| C * | Amage Asiaticus Uschakov, 1955 |
| C * | Amage Auricula Malmgren, 1866 |
| C * | Ampharetus Acutifrons (Grube, 1860) |
| C * | Ampharetus Arctica Malmgren, 1866 |
| C * | Ampharetus Goesi Malmgren, 1865 |
| C * | Ampharetus Johanseni Chamberlin, 1920 |
| C * | Ampharetus Reduca Chamberlin, 1920 |
| C * | Ampharetus Vega (Wiren, 1883) |
| * | Amphicecis Gunneri (Sars, 1835) |
| C * | Amphicecis Sundevalli Malmgren, 1866 |
| * | Anaitides Groenlandica (Oersted, 1842) |
| * | Anaitides Yucosa (Oersted, 1843) |
| * | Anaspio Rocesus Chamberlin, 1920 |
| * | Antinoella Badia (Theel, 1879) |
| C * | Antinoella Sarsi Malmgren, 1865 |
| * | Aristobranchus Tullberg (Theel, 1879) |
| * | Arctoeorgia Anticoostiensis (Mcintosh, 1934) |
| * | Arenicola Glacialis Murdoch, 1834 |
| * | Aricidea Suedica Eliason, 1920 |
| C * | Artacama Proboscidea Malmgren, 1866 |
| * | Asabellaides Lineata (Berkeley + Berkeley, 1943) |
| * | Asabellaides Sibirica (Wiren, 1893) |
| * | Autolytus Alexaneri Malmgren, 1867 |
| * | Autolytus Fallax Malmgren, 1867 |
| * | Autolytus Prismaticus (Fabricius, 1780) |
| * | Brada Granulata Malmgren, 1867 |
| * | Brada Inhabilis (Rathke, 1843) |
| * | Brada Villosa (Rathke, 1843) |
| * | Branchioma Infarcata (Kroyer, 1856) |
| C * | Capitella Capitata (Fabricius, 1780) |
| * | Chaetoezone Setosa Malmgren, 1957 |
| * | Chitinoptycha Groenlandica (Morch, 1863) |
| C * | Chone Duneri Malmgren, 1967 |
| * | Chone Infundibiliformis Kroyer, 1856 |
| C * | Cirratulus Cirratus (Muller, 1776) |
| * | Circophorus Nordica (Strelzov, 1968) |
| C * | Cossura Longocirrata Webster + Benedict, 1937 |
| * | Diploricirrus Glaukus (Malmgren, 1867) |
| * | Dysphoneus Pygmaeus Levinson, 1879 |
| * | Enipo Gracilis Verrill, 1874 |
| * | Eteone (Mysta) Barbata (Malmgren, 1865) |
| * | Eteone Flava (Fabricius, 1780) |
| C * | Eteone Longa (Fabricius, 1780) |
| * | Eteone Spetsbergensis Malmgren, 1865 |
| * | Euchone Analis (Kroyer, 1856) |
ARCTIC SPECIES LIST

* Euchone Papillosa (Sars, 1851)
* Eucranta Villosa Malmgren, 1865
* Eumida Minuta (Cittevsen, 1917)
* Eunoe Clarki Pettibone, 1951
* Eunoe Nodosa (Sars, 1861)
* Eunoe Oerstedi Malmgren, 1865
* Eusylis Blomstrandii Malmgren, 1967
* Eusylis Magnifica (Moore, 1976)
* Exogone Dispar (Webster, 1879)
* Euthya Naidina Oersted, 1845
* Flabelligera Affinis M. Sars, 1839
* Flabelligera Mastigophora Annenkova, 1952
* Gattyana Ciliata Moore, 1902
* Gattyana Cirrosa (Pallas, 1766)
* Glycera Capitata Oersted, 1843
* Glycinde Wireni Arwidsson, 1898
* Glyphanostomum Pallescens (Theel, 1879)
* Harmothoe Extenuata (Grube, 1840)
* Harmothoe Imbricata (Linnaeus, 1767)
* Harmothoe (Eunoe) Nodosa (Sars, 1860)
* Harmothoe (Eunoe) Oerstedi (Malmgren, 1865)
* Hartania Moorei Pettibone, 1955
* Heteromastus Filiformis (Claparede, 1864)
* Idanthrysus Armatus Kinberg, 1867
* Lacydonia Papillata Uschakov, 1958
* Laeospira Granulatus (Linnaeus, 1767)
* Lagisca Multi setosa Moore, 1902
* Lanassa Nordenskioldi Malmgren, 1866
* Lanassa Venusta (Malm, 1974)
* Langerhansia Cornuta (Rathke, 1843)
* Laonice Cirrata (M. Sars, 1951)
* Laphania Boecki Malmgren, 1865
* Leaena Abranchiata Malmgren, 1865
* Leioclymene Minor Arwidsson, 1907
* Lumbrineris Fragilis (Muller, 1776)
* Lumbrineris Minuta (Theel, 1879)
* Lumbrineris Tenuis (Verrill, 1873)
* Lumbrineris Zonata (Johnson, 1901)
* Lyssipe Labiata Malmgren, 1865
* Macellicephala Affinis Fauvel, 1914
* Malacocercs Fuliginosus (Claparede, 1870)
* Maldane Sarsi Malmgren, 1865
* Melaenis Loventi Malmgren, 1965
* Melinna Cristata (Sars, 1851)
* Melinnesis Somovi Uschakov, 1957
* Micronephthys Minuta (Theel, 1879)
* Myriochele Heeri Malmgren, 1957
* Mystides Porealis Theel, 1879
* Myxicola Infundibulum (Renier, 1804)
* Newita Torelli Malmgren, 1865
* Neogastropite Groenlandica (Malmgren, 1865)
ARCTIC SPECIES LIST

C * NEPHTYS CILIATA (MULLER, 1776)
   NEPHTYS JISCORS EHlers, 1963
C * NEPHTYS LONGOSETOSA OERSTED, 1843
C * NEPHTYS PARADOXA MALM, 1874
C * NEREIMYRA APHRODITOIDES (FABRIGIUS, 1780)
   NEREIMYRA MULTIPAPILLATA (THEEL, 1879)
C * NEREIS ZONATA MALMGREN, 1967
   NICOLEA VENUSTULA (MONTAGU, 1813)
C * NICOLEA ZOSTERICOLA (OERSTED, 1844)
   NICOMACHE LUMBRICALIS (FABRICIUS, 1780)
   NICOMACHE PERSONATA JOHNSON, 1901
C * NOTOPROCTUS OCULATUS ARCTICA ARWIDSSON, 1907
C * ONUPHIS (NOTHRIA) CONCHYLEGA SARS, 1835
C * ONUPHIS (CNUPHIS) QUADRICUSPIS M. SARS, 1872
C * OPHELINA ABRANCHIATA STOP-BOWITZ, 1943
   OPHELINA AUROGASTER RATHKE, 1843
   OPHELINA PREVIATA (EHlers, 1913)
C * OPHELINA CYLINDRICAUDATUS (HANSEN, 1879)
   OWENIA FUSIFORMIS DELLE CHIAJE, 1844
   OXYDROMUS PROPINGUUS (MARION + BOBRETZKY, 1875)
C * PECTINARIA (CISTENIDES) GRANULATA (LINNAEUS, 1767)
   PECTINARIA (CISTENIDES) HYPERBorea (MALMGREN, 1865)
C * PETALOPROCTUS TENUIS (THEEL, 1879)
   PHOLOE MINUTA (FABRICIUS, 1780)
C * PHYLLOCHAETOPTERUS CLAPAREDII MCINTOSH, 1885
   PIONOSYLLIS COMPACTA MALMGREN, 1867
   PISTA MACULATA (DALYELL, 1853)
   POLYCHIRPS MEDUSA GRUBE, 1855
C * POLYDORA CAECA (OERSTED, 1843)
   POLYDORA CAULLERYI MESNIL, 1897
C * POLYDORA CUADRICUBATA JACOBI, 1883
   POLYPHYSTIS CRASSA (OERSTED, 1933)
C * PROTAMILLA NEGLICIA (SARS, 1851)
   PRAXILELLELA AFFINIS (SARS, 1872)
C * PRAXILELLELA PRAETERMISSA (MALMGREN, 1866)
C * PRIONOSPIC CIRRIFERA WIREN, 1883
C * PRIONOSPIC MALMGRENII CLAPAREDE, 1870
C * PROCLEA GRAFFII (LANGERHANS, 1934)
   PSHEUDOPROTAMILLA RENIFORMIS (MULLER, 1783)
C * PYGOSPIIO ELEGANS CLAPAREDE, 1863
   RHODINE LOVEni MALMGREN, 1865
   SABELLA CRASSICORNIS M. SARS, 1851
C * SABELLIDES BOREALIS M. SARS, 1856
   SABELLIDES OCTOCIRRATA (SARS, 1835)
   SANYTHA SEXCIRRATA (SARS, 1856)
   SCALIBREGIA INFLATUM RATHKE, 1843
C * SCHISTOMERINGOS CAECA (WEBSTER + BENEDECT, 1884)
C * SCOLOELEPIDES ARCTICUS CHAMBERLIN, 1920
C * SCOLOPLOS ACUTUS (VERRILL, 1873)
C * SCOLOPLOS ARMIGER (MULLER, 1776)
ARCTIC SPECIES LIST

C * SCOLOPLOS ELONGATA (JOHNSON, 1901)
C * SIGAMBRA TENTACULATA (TREADWELL, 1941)
   SKADARIA FRAGMENTATA WESENBERG-LUNDB, 1951
   * Sphaerodorus Biserialis (BERKELEY + BERKELEY, 1944)
C * Sphaerodorus Minuta (WEBSTER + BENEDICT, 1987)
   * Sphaerodorum Gracilis (RATHKE, 1843)
   Sphaerosyllis Erinaceus CLAPAREDE, 1863
C * SPIO FILICORNIS (MULLER, 1776)
C * SPIO MIMUS CHAMBERLIN, 1920
C * SPICHAECTOPERUS TYPICUS M. SARS, 1856
   Sphirodis Spirillum (LINNAEUS, 1758)
C * STERNASPIS FOSSOR STIMPSON, 1853
   * Sternaspis Scutata (RENIER, 1807)
C * Terebellides Strcalei M. SARS, 1935
   * Tharyx Acutus Webster + Benedict, 1887
   Tharyx Multifilis MOORE, 1909
   Thelepus CinncinatuS (FABRICIUS, 1780)
   Travisia Brevis MOORE, 1923
   Travisia Carnea VERRILL, 1873
C * Travisia Forbesi JOHNSON, 1840
   Trichobranchus Glacialis MALMGREN, 1865
C * Trochochaeta Carica (BIRULA, 1879)
   Tyfosyllis Fasciata (MALMGREN, 1867)
ARCTIC SPECIES LIST

PHYLUM ARTHROPODA

AMPHIPODA

C * ACANTHONOTOZOMA INFATUM (KROYER, 1842)
C * ACANTHONOTOZOMA SERRATUM (FABRICIUS, 1793)
* ACANTHOSTEPHEIA BEHRINSIENSIS (LOCKINGTON, 1877)
C * ACANTHOSTEPHEIA MALMGERI (GOES, 1866)
C * ACERIOIDES LATIPES (SARS, 1892)
* ACIDOOSTOMA LATICORNE G. SARS, 1879
C * AMPHILISCA BIRULAI BRUGGEN, 1909
C * AMPHILISCA ESCHRICHTI KROYER, 1842
C * AMPHILISCA MACROCEPHALA LILJEBOG, 1852
* ANISOGAMMARUS MACGINITIEI SHOEMAKER, 1955
C * ANONYX DEBRUYNNI HOEK, 1882
* ANONYX LILLJEBOGII BOECK, 1870
C * ANONYX NUGAX (PHIPPS, 1774)
* ANONYX PACIFICUS GURJANOVA, 1962
* ANONYX Sarsi STEELE + BRUNEL, 1968
* APERUSA GLACIALIS (HANSEN, 1887)
C * APERUSA MEGALOPS (BUCHHOLZ, 1874)
C * APERUSA Sarsi SHOEMAKER, 1930
C * ARGISSA HAMATIPES (NORMAN, 1890)
C * ARISTIAS TUMIDUS (KROYER, 1846)
* ARRHINOPSIS LONGICORNIS STAPPERS, 1911
C * ARRIS LUTHEI GURJANOVA, 1936
C * ARRIS PHYLLONYX (M. SARS, 1858)
C * ATYLUUS BRUGGENI (GURJANOVA, 1938)
C * ATYLUUS CARINATUS (FABRICIUS, 1793)
C * ATYLUUS SMITTI (GOES, 1866)
C * BATHYMEOON OBSOUSIRES (HANSEN, 1887)
C * BOECKOSIMUS AFFINIS (HANSEN, 1836)
BOECKOSIMUS BOTKINI (BIRULA, 1897)
BOECKOSIMUS BREVICAUDATUS (HANSEN, 1836)
BOECKOSIMUS NORMANI (G. SARS, 1895)
C * BOECKOSIMUS PLAUTUS (KROYER, 1845)
C * BYBLIS GAIMARDI (KROYER, 1846)
CAPRELLA CARINA MAYER, 1903
CAPRELLA LINEARIS (LINNAEUS, 1767)
* CENTROMECON CALCIFATUS (G. SARS, 1879)
C * CENTROMECON PUMILUS (LILJEBOG, 1865)
GERADUGUS TOPELLI (GOES, 1866)
* GEOPHIS HCBOLLI KROYER, 1842
C * COROPHIUM ACHERUSICUM COSTA, 1857
C * COROPHIUM CLARENCESENSE SHOEMAKER, 1949
CYAMUS Ceti (LINNAEUS, 1758)
CYAMUS KESSLERI BRANDT, 1972
CYAMUS SCAMMONI DALL, 1872
* DULICHIA ARCTICA MURDOCH, 1885
C * DULICHIA BISPINA GURJANOVA, 1930
C * DULICHIA FALCATA (BATE, 1857)
ARCTIC SPECIES LIST

* DULICHIA PORRECTA (BATE, 1857)
* DULICHIA SFINOSISSIMA KROYER, 1845
* DULICHIA TUBERCULATA BOECK, 1871
* EPIMERIA LORICATA G. SARS, 1879
* ERICHTHONIUS HUNTERI (BATE, 1862)
* ERICHTHONIUS MEGALOPS (G. SARS, 1879)
* ERICHTHONIUS TOLLI BRUGGEN, 1909
* EURYTHENES GRYLLUS (LICHTENSTEIN, 1822)
* EUSIRUS CUSPIDATUS KROYER, 1845
* GAMMARACANTHUS LORICATUS (SABINE, 1821)
* GAMMAROPSIS DENTATUS (HOLMES, 1909)
* GAMMAROPSIS MACULATUS (JOHNSTON, 1827)
* GAMMAROPSIS MELANOPS (G. SARS, 1882)
* GAMMARUS LOCUSTA (LINNAEUS, 1758)
* GAMMARUS OCEANICUS SEGERSTRALE, 1947
* GAMMARUS SETOSUS DEMENTIEVA, 1931
* GITANA ROSTRATA BOECK, 1871
* GIANOPSIS ARCTICA G. SARS, 1892
* GOESIA DEPRESSA (GOES, 1866)
* GUERNEA NORSENSKJOLDI (HANSEN, 1887)
* HALIRAGES QUADRICENTATUS G. SARS, 1875
* HAPLOOPS LAEVIS BOECK, 1871
* HAPLOOPS SIBIRICA GURJANOVA, 1929
* HAPLOOPS TUBICOLA LILJEBORG, 1855
* HARPINIA KOBJAKOVAE BULYCHEVA, 1936
* HARPINIA MUCRONATA G. SARS, 1879
* HARPINIA PECTINATA G. SARS, 1891
* HARPINIA SERRATA G. SARS, 1879
* HIPPOMEDON ABYSSI (GOES, 1866)
* HIPPOMEDON DENTICULATUS (BATE, 1857)
* HIPPOMEDON GORJUNOVI GURJANOVA, 1930
* HIPPOMEDON HOLBOLLI (KROYER, 1846)
* HIPPOMEDON PROPINQUUS G. SARS, 1890
* ISCHYROCERUS COMPENSALIS CHEVREUX, 1900
* ISCHYROCERUS MEGALOPS G. SARS, 1894
* ISCHYROCERUS LATIPES KROYER, 1842
* LEMBOS ARCTICUS (HANSEN, 1887)
* LEPIDEPECREUM EOMU GURJANOVA, 1938
* LEPIDEPECREUM UMBO (GOES, 1866)
* LILJEBORGIA FISSICORNIS (G. SARS, 1858)
* MAERA OANAE (STIMPSON, 1854)
* MELITA DENTATA KROYER, 1942
* MELITA FORMOSA MUROOCH, 1936
* MELITA VALDIA SHOEMAKER, 1955
* MELITOIDES YAKAROVI GURJANOVA, 1934
* MESOMETOPA GIBBOSA SHOEMAKER, 1955
* MESOMETOPA NEGLECTA (HANSEN, 1887)
* METOPA BRZELII (GOES, 1866)
* METOPA CLYPEATA KROYER, 1842
* METOPA GLACIALIS (KROYER, 1842)
ARCTIC SPECIES LIST

METOPA LONGICORNIS BOECK, 1871
METOPA PROFINQUA G. SARS, 1892
C * METOPA ROBUSTA G. SARS, 1892
C * METOPA SFINICOXA SHOEMAKER, 1955
* METOPA TENUIMANA G. SARS, 1892
C * METOCHELLA CARINATA (HANSEN, 1897)
METOCHELLA LONGIMANA (BOECK, 1871)
C * METOCHELLA NASUTA (BOECK, 1871)
METOCHELLOIDES STEPHENSENI GURJANOVA, 1938
METOCHELLOIDES TATTERSALLI GURJANOVA, 1938
C * MONOCULODES BOREALIS BOECK, 1871
* MONOCULODES DIAMESUS GURJANOVA, 1936
C * MONOCULODES LATIMANUS (GOES, 1856)
C * MONOCULODES LONGIROSTRIS (GOES, 1866)
C * MONOCULODES PACKARDI BOECK, 1871
C * MONOCULODES SCHNEIDER G. SARS, 1995
C * MONOCULODES TUBERCULATUS BOECK, 1871
C * MONOCULOPSIS LONGICORNIS BOECK, 1871
C * NEOHELA MCNSTRATA (BOECK, 1881)
* NEOHELA OILAMESUS GURJANOVA, 1936
C * NEOHELA NASUTA (BOECK, 1871)
C * NEOHELA SCHNEIDER G. SARS, 1995
C * NEOHELA TUBERCULATUS BOECK, 1871
C * OEDICEROS SAGINATUS GOES, 1842
ONISIMUS BIRULAI (GURJANOVA, 1929)
C * ONISIMUS GLACIALIS (G. SARS, 1900)
* ONISIMUS LITORALIS (KROYER, 1845)
ONISIMUS NASEN (G. SARS, 1900)
ORCHOMENE GROENLANDICA (HANSEN, 1887)
C * ORCHOMENE MINUTA (KROYER, 1846)
C * ORCHOMENE PINGUIS (BOECK, 1861)
C * ORCHOMENE SERRATA (BOECK, 1861)
ORCHOMENE TRIANGULUS (STEPHENSEN, 1925)
C * PARADULICHIA TYPICA BOECK, 1870
C * PARADULICHIA SETOSUS STEPHENSEN, 1923
C * PARAPITHOE HYSTRIX (ROSS, 1835)
C * PARAPITHOE POLYACANTHA (MURDOCH, 1835)
C * PARAPHOXUS OCUULATUS G. SARS, 1879
C * PARAPLEXUSTES ASSIMILIS (G. SARS, 1882)
C * PARAPLEXUSTES GRACILIS (BUCHHOLZ, 1874)
C * PAROALISCA ARYSSI BOECK, 1871
C * PAROALISCA CUSPIDATA KROYER, 1842
C * PAROALISCA TENUIPES G. SARS, 1893
C * PAROALISCELLA LAVROVI GURJANOVA, 1934
C * PAROALISCELLA MALYGINI GURJANOVA, 1936
C * PAROEDICEROS LYNEUS (M. SARS, 1858)
C * PAROEDICEROS PROFINQUUS (GOES, 1866)
C * PARONESIMUS BARENTSI STEENING, 1894
* PERIOCUOLDES LONGIMANUS (BATE + WESTWOOD, 1963)
C * PHOTIS REINHARDI KROYER, 1842
* PHOTIS VINOGADOVA GURJANOVA, 1953
FLEUSTES MEDEUS (GOES, 1966)
ARCTIC SPECIES LIST

C * PLEUSTES PANOPLA (KROYER, 1838)
C * PLEUSYMTE KARIANUS (STAPPERS, 1911)
PLEUSYMTE PULCHELLUS (G. SARS, 1876)
PLEUSYMTE UNCIGERA (GURJANOVA, 1938)
C * PODOCEROPSIS LINDAHLI HANSEN, 1887
C * PONTOPOREIA AFFINIS (LINDSTROM, 1855)
C * PONTOPOREIA FEMCARTA KROYER, 1842
* FRISCILLINA ARMATA (BOECK, 1861)
PROPLOIDES NORDMANNI (STEPHENSEN, 1931)
PROTHAUMATELSON CARINATUS SHOEMAKER, 1955
C * PROTOPOREIA FASCIATA KROYER, 1842
C * PROTOPOREIA GRANDIMANA BRUGGEN, 1905
PROTOPOREIA STEPHENSENI SHOEMAKER, 1955
C * RHACHOTROFIS ACULEATA (LEPECHIN, 1780)
C * RHACHOTROFIS HELLERI (BOECK, 1871)
C * RHACHOTROFIS INFLATA (G. SARS, 1882)
C * ROZINANTE FRAGILIS (GOES, 1866)
C * SOCARNES BIIDENTICULATA (BATE, 1858)
STEGOCEPHALOPSIS AMPULLA (PHIPPS, 1774)
C * STEGOCHEPHALUS INFLATUS KROYER, 1842
C * STENOPLEUSTES ELCINGI GURJANOVA, 1930
STENOTHOE BARROWENSIS SHOEMAKER, 1955
STENOTHICES ANGUSTA SHOEMAKER, 1955
C * SYRHOE CRENULATA GOES, 1866
C * TIRON SPINIFERUM (STIMPSON, 1854)
C * TIRONYX CICADA (FABRICIUS, 1780)
TMETONYX GULOSUS (KROYER, 1845)
* TRYPHOSELLA GROENLANJICA (SCHELLENBERG, 1935)
C * TRYPHOSELLA PUSILLA (G. SARS, 1869)
C * TRYPHOSELLA RUSANOV (GURJANOVA, 1933)
C * TRYPHOSELLA SCHNEIDERI (STEPHENSEN, 1921)
C * UNCIOLA LEUCOPIS (KROYER, 1845)
* WESTWOODILLA BREVICALAR (GOES, 1866)
WESTWOODILLA CAECULA (BATE, 1855)
C * WESTWOODILLA MEGALOPS G. SARS, 1882
C * WEYPRECHTIA HEUGLINI (BUCHHOLZ, 1874)
C * WEYPRECHTIA PINGUIS (KROYER, 1938)
ARCTIC SPECIES LIST

PHYLUM ARTHROPODA

CIRRIPEDIA

BALANUS BALANUS (LINNAEUS, 1758)
* BALANUS CRENATUS BRUGUIERE, 1789
BALANUS COSTRATUS APERTUS PILSBRY, 1911
ARCTIC SPECIES LIST

PHYLUM ARTHROPODA

COPEPODA

C * AMPHIASCUS PROPINOVUS G. SARS, 1906
C * ARGESTES MOLLIS G. SARS, 1910
C * BRADYA CONFLUENS LANG, 1936
BRADYA TYPICA BOECK, 1872
CANUELLA FURCIGERA G. SARS, 1903
C * CERVINIA BRANDY NORMAN, 1378
C * CERVINIA SYNARTHRA G. SARS, 1903
CHONIOSTOMA MIRABILE HANSEN, 1886
DANIELSSSENIA FUSIFORMIS (BRADY + ROBERTSON, 1975)
DANIELSSSENIA STEPANSSONI WILLEY, 1920
ECHINOPSyllUS NORMANI G. SARS, 1909
HAEMOBAPHES CYCLOPTERINA (FABRICIUS, 1780)
HALFOTINOSOMA FINMARCHICUM (T. SCOTT, 1903)
C * HARPACTICUS SUPERFLEXUS WILLEY, 1920
HERPYLLOBIUS ARCTICUS STEENSTRUP + LUTKEN, 1978
LONGIPEDIA CORNUTA CLAUS, 1863
MICROARTHRIDION LITTORALE (POPE, 1881)
OITHONA SIMILIS CLAUS, 1866
C * PARAMPHIASCOPSIS GIESBRECHTI (G. SARS, 1910)
C * PARAMPHIASCOPSIS LONGIROSTRIS (CLAUS, 1863)
C * RARANANNOUS ECHINATUS SMIRNOV, 1946
PROAMIERA HIDDENSOENSIS (SCHAFER, 1936)
SACCOPSIS TEREBELLIDIOS LEVINSEN, 1878
SARSOCLETIES TYPICUS (G. SARS, 1920)
SCHIZOPRCCTUS INFLATUS AURIVILLIUS, 1885
STHENHELIA NUMUKENSIS WILSON, 1965
C * TYPHLAMPHIASCUS CONFUSUS (T. SCOTT, 1302)
ARCTIC SPECIES LIST

PHYLUM ARTHROPODA

CUMACEA

C * BRACHYDIASTYLIS NIMIA HANSEN, 1920
C * BRACHYDIASTYLIS RESIMA (KROYER, 1846)
    CAMPYLASPIS AFFinis G. SARS, 1870
C * CAMPYLASPIS RUBICUNDA (LILJEBORG, 1855)
C * CUMELLA CARINATA (HANSEN, 1887)
C * DIASYLIS ASPERA CALMAN, 1912
C * DIASYLIS BIDENTATA CALMAN, 1912
    DIASYLIS DALLI CALMAN, 1912
    * DIASYLIS ECHINATA BATE, 1865
C * DIASYLIS EDWAROSI (KROYER, 1841)
C * DIASYLIS GLABRA (ZIMMER, 1903)
C * DIASYLIS GOODSI R (BELL, 1855)
    DIASYLIS LAEVIS NORMAN, 1869
C * DIASYLIS NUCELLA CALMAN, 1912
C * DIASYLIS OXYRHYNCHA ZIMMER, 1926
    DIASYLIS POLARIS G. SARS, 1871
C * DIASYLIS POLITA SMITH, 1879
C * DIASYLIS RATHKEI (KROYER, 1841)
C * DIASYLIS SCORPICIDES (LEPECHIN, 1780)
C * DIASYLIS SPINULCSA HELLER, 1875
C * DIASYLIS SULCATA CALMAN, 1912
    DIASYLIS SULCATA STUXBERGI ZIMMER, 1926
C * DIASYLIS TUMIDA (LILJEBORG, 1855)
C * EUDORELLA ARCTICA HANSEN, 1920
C * EUDORELLA EMARGINATA (KROYER, 1846)
C * EUDORELLA GRACILIS G. SARS, 1871
C * EUDORELLA GROENLANDICA ZIMMER, 1926
    * EUDORELLA HISPIDA G. SARS, 1871
C * EUDORELLA PARVULA HANSEN, 1920
    * EUDORELLA PUSILLA G. SARS, 1871
C * EUDORELLA TRUNCATULA (BATE, 1856)
    * EUDORELLOPSIS DEFORMIS (KROYER, 1846)
    EUDORELLOPSIS DERZHAVINI LOMAKINA, 1952
C * EUDORELLOPSIS INTEGRA (SMITH, 1879)
    HEMILAMPROPS CRISTATA (G. SARS, 1870)
C * LAMPROPS FASCIATA G. SARS, 1863
    LEPTOSTYLIS LONGIMANA (SARS, 1869)
C * LEUCON ACUTIROSTRIS G. SARS, 1865
C * LEUCON FULVUS G. SARS, 1865
C * LEUCON LATICAUDA LOMAKINA, 1952
C * LEUCON NASICA (KROYER, 1841)
C * LEUCON NASICOIDES LILJEBORG, 1855
C * LEUCON NATHORSTI OHLIN, 1901
C * LEUCON PALLIDUS G. SARS, 1865
C * PETALOSARSIA OECULVIS (G. SARS, 1864)
ARCTIC SPECIES LIST

PHYLUM ARTHROPODA

DECAPODA—NATANTIA

ARGIS DENTATA RATHBUN, 1902
C * ARGIS LAR (OWEN, 1839)
CRANGON COMMUNIS RATHBUN, 1899
EUALUS FABRICII (KROYER, 1841)
C * EUALUS GAIMARDII (MILNE-EDWARDS, 1837)
C * EUALUS MACILENTUS (KROYER, 1879)
EUALUS SUCKLEYI (STIMPSON, 1854)
HEPTACARPUS FLEXUS (RATHBUN, 1902)
C * LEBBEUS GROENLANTIUS (FABRICIUS, 1793)
C * LEBBEUS POLARIS (SABINE, 1824)
PANDALUS BOREALIS KROYER, 1838
C * PANDALUS GONIURUS STIMPSON, 1960
* SABINEA SEPTEMCARINATA (SABINE, 1824)
* SCLEROCRANGON BOREAS (PHIPPS, 1774)
SCLEROCRANGON FEROX (G. SARS, 1877)
SPIRONTOCARIS ARCUATA RATHBUN, 1902
C * SPIRONTOCARIS DALLI RATHBUN, 1902
C * SPIRONTOCARIS PHIPPSII (KROYER, 1841)
C * SPIRONTOCARIS SPINUS (SOWERBY, 1805)
ARCTIC SPECIES LIST

PHYLUM ARTHROPODA

OECAPODA—REPTANTIA

CHIONOCETES OPILIO (FABRICIUS, 1793)
HYAS COARCTATUS LEACH, 1815
HYAS COARCTATUS AL'JTACEUS BRANDT, 1851
PAGURUS SPLENDESCENS OWEN, 1839
PAGURUS TRIGONOCHIEIRUS (STIMPSON, 1858)
PARALITHOSES CAMTSCHATICUS (TILESIUS, 1812)
**ARCTIC SPECIES LIST**

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**ISOPODA**

ARCTURUS BAFINII (SABINE, 1824)
ARGEIA PUGETENSIS DANA, 1852
BOPYROIDES HIPPOLYTES (KROYER, 1838)
DAJUS MYSIDIS KROYER, 1842
* DESMOSOMA LINEARE G. SARS, 1864
EUGERDA INTERMEDIA (HULT, 1936)
* EUGERDA TENUIMANA (G. SARS, 1863)
EURYCOPE COMPLANATA BONNIER, 1896
EURYCOPE MUTICA G. SARS, 1864
* EURYCOPE FYGMAEA G. SARS, 1870
GNATHIA ALBESCENS HANSEN, 1916
* GNATHIA ELONGATA (KROYER, 1846)
* GNATHIA STYGIA (G. SARS, 1864)
HEMIARTHUS ABDOMINALIS (KROYER, 1840)
JANIRA ALASCENS (BENEDICT, 1905)
* MACROSTYLIS SPINIFERA G. SARS, 1864
C * MESIDOTEA ENTOMON. (LINNAEUS, 1767)
C * MESIDOTEA SABINI (KROYER, 1847)
* MESIDOTEA SIBIRICA (BIRULA, 1896)
MIRABILICCA BIRSTEINI (MENZIES, 1962)
MIRABILICCA FLETCHERI PAUL & MENZIES, 1974
* MUNNOPSIS TYPICA G. SARS, 1861
OECIODIOBRANCHUS FLEBEJUM (HANSEN, 1916)
PLEUROPRIC NICOLAI (BENEDICT, 1898)
ROCINELA BELLICEPS (STIMPSON, 1864)
C * SYNIDOTEA BIGUSPIDA (OWEN, 1839)
SYNIDOTEA LAEVIS BENEDICT, 1897
SYNIDOTEA MURICATA (HARFORD, 1877)
SYNIDOTEA PICTA BENEDICT, 1897
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PHYLUM ARTHROPODA

OSTRACODA

ASTEROPÆ MARIAE (BAIRD, 1850)
CONCHOECIA MAXIMA (BRADY + NORMAN, 1896)
* CYPRIDEIS SORBÝANA (JONES, 1896)
* CYTHEREIS DUNELMENSIS NORMAN, 1865
CYTHEREA PUNCTILLATA BRADY, 1865
* PHILOMEDES GLO3OSUS (LILJEBORG, 1853)
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PYCNOGONIDA

ACHELIA BCREALIS (SCHIMKIEWITSCH, 1895)
ACHELIA SFINOSA (STIMPSON, 1853)
NYMPHON BREVITARSE KROYER, 1839
*NYMPHON GROSSIPES (FABRICIUS, 1794)
NYMPHON HIRTIPLS BELL, 1853
NYMPHON LONGLITARSE KROYER, 1844
NYMPHON MIXTUM KROYER, 1844
NYMPHON SLUITERI HOEK, 1891
OROPALLENE POLARIS HEDGEPETH, 1963
PHOXICHILIDUM QUADRIDENTATUM HILTON, 1942
PSEUPOPALLENE CIRCULARIS (GOODSIR, 1842)
TANYSTYLMUM ANTHOMASTI HEDGEPETH, 1949
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PHYLUM ARTHROPODA

TANAIDACEA

* LEPTOGNATHIA LONGIREMIS (LILJEBORG, 1865)
* PSEUDOTANAIS MACROCHELES G. SARS, 1899
* SPHYRAPUS ANOMALUS (G. SARS, 1869)
* TYPHOTANAIS FINMARCHICUS G. SARS, 1882
LEPTOGNATHIA ARMATA HANSEN, 1913
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* CRYPTOPORA GNOMON JEFFREYS, 1869
  DIELSTOTHYRIS SPITZBERGENSIS (DAVIDSON, 1852)
* HEMITHYRUS PSITTACEA (GMELIN, 1792)
ARCTIC SPECIES LIST

PHYLUM BRYOZOA

ALCYOONIIDUM DISCIFORME (SMITT, 1871)
ALCYONIIDUM ENTEROMORPHA SOULE, 1951
ALCYOONIIDUM GELATINOSUM (LINNAEUS, 1757)
ALCYOONIIDUM PENICULATUM ROBERTSON, 1902
ALCYOONIIDUM POLYCUM (HASSELL, 1841)
AMPHIDESTRUM TRIFOLIUM (HOOD, 1850)
BIDENKAPIA SPITSBERGENSIS (BIDENKAP, 1897)
BIDENKAPIA SPITSBERGENSIS ASASKENSIS OSBURN, 1950
BORGISELA FUSTULOSA OSBURN, 1950
BOVERBANKIA GRACILIS AGGREGATA O DONOHUE, 1926
CALLOPOREA AURITA (HINCKS, 1877)
CALLOPOREA CRATICULA (ALDER, 1857)
CALLOPOREA WHITEAVESI NORMAN, 1903
CARBASEA CARBASEA (SOLANDER, 1786)
CAULORAMPHUS CYMBAEFORMIS (HINCKS, 1877)
CALLEPORINA SURGULARIS (PACKARD, 1863)
CALLEPORINA VENTRICOSA (LORENZ, 1886)
COSTAZIA NORDENSKJOLOI (KLUGE, 1929)
COSTAZIA SURGULARIS (PACKARD, 1863)
COSTAZIA VENTRICOSA (LORENZ, 1886)
CRIBRILINA ANNULATA (FABRICIUS, 1780)
CRISIA CRIBRARIA STIMPSON, 1853
CRISIA EBLRNEA (LINNAEUS, 1758)
CYLINDROPORELLA TUBULOSA (NORMAN, 1868)
CYSTISELLA BICORNIS OSBURN, 1950
CYSTISELLA SACCATA (BUSK, 1856)
DENDROBEANIA MURRAYANA (JOHNSTON, 1847)
DIAPEROCORIA INTERMEDIA (O DONOGUE, 1923)
DIAPEROCORIA JOHNSTONI (HELLER, 1867)
DIPLOSOLEN OBELIUM (JOHNSTON, 1838)
DORYPORELLA SPATHULIFERA (SMITT, 1867)
ELECTRA ARCTICA BORG, 1831
EMBALLOTHECA STYLIFERA (LEVINSOEN, 1885)
ESCHARELLA CONNECTENS (RILEY, 1881)
ESCHARELLA VENTRICOSA (HASSALL, 1842)
ESCHAROIDES JACKSONI (WATERS, 1900)
EURATEA LORICATA (LINNAEUS, 1753)
EURITINA ARCTICA OSBURN, 1950
FLUSTRELLA CORNICULATA (SMITT, 1871)
FLUSTRELLA GIGANTEA SILLEN, 1947
HEMICYCLOFORA POLITA (NORMAN, 1864)
HINCKSINA GOTHICA OSBURN, 1953
HINCKSINA NIGRANS (HINCKS, 1892)
HINCKSIPORA SPINULIFERA (HINCKS, 1889)
HIPPODIPLCSIA CANCELLATA (SMITT, 1867)
HIPPODIPLCSIA RETICULATO-PUNCTATA (HINCKS, 1877)
HIPPOPORELLA HIPPUS (SMITT, 1867)
HIPPOPORINA CANCELLATA (SMITT, 1867)
HIPPOTHOA DIVARICATA LAMOURoux, 1931
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<td>Hippothoa hyalina  (Linnaeus, 1767)</td>
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<td>Lepraliella contigua  (Smitt, 1867)</td>
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<td>Lichenopora canaliculata  (Busk, 1876)</td>
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<td>Lichenopora verrucaria  (Fabricius, 1780)</td>
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<td>Microporella arctica  (Norman, 1903)</td>
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<td>Membranipora serrulata  (Busk, 1878)</td>
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<td>Membraniporea crassicosta  Hincks, 1883</td>
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<td>Microporina articulata  (Fabricius, 1824)</td>
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<td>Microporina borealis  (Busk, 1855)</td>
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<td>Mucronella labiata  Levensen, 1836</td>
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<td>Mucronella microstoma  (Norman, 1868)</td>
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<td>Myriapora subgracile  (d'Orbigny, 1853)</td>
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<td>Myriozella plana (Dawson, 1859)</td>
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<td>Oncousoecia canacensis  Osburn, 1933</td>
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<td>Oncousoecia diastoporides  (Norman, 1858)</td>
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<td>Pachyegis brunnea  (Hincks, 1889)</td>
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<td>Pachyegis producta  (Packard, 1863)</td>
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<td>Parasmittina alaskensis  Osburn, 1950</td>
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<td>Parasmittina jeffreysi  (Norman, 1876)</td>
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<td>Parasmittina trispinosa  (Johnston, 1838)</td>
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<td>Plagioccia ambiguca  Osburn, 1950</td>
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<td>Plagioecia grimaldii (Jullien, 1903)</td>
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<td>Porella acutirostris  Smitt, 1867</td>
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<td>Porella compressa  (Sowery, 1905)</td>
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<td>Porella concinna  (Busk, 1854)</td>
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<td>Porella minuta  (Norman, 1869)</td>
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<td>Posterula sarsi  (Smitt, 1867)</td>
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<td>Proboscina ingrassata  (Smitt, 1866)</td>
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<td>Ragionula rosacea  (Busk, 1856)</td>
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<td>Reginella spitsbergensis  (Norman, 1903)</td>
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<td>Rhaphostomella bilaminata  (Hincks, 1877)</td>
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<td>Rhaphostomella costata  Lorenz, 1886</td>
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<td>Rhaphostomella fortissima  Sidenkap, 1900</td>
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<td>Rhaphostomella gigantea  Osburn, 1950</td>
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<td>Rhaphostomella hicksi  Nordgaard, 1906</td>
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<td>Rhaphostomella cvata  (Smitt, 1867)</td>
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<td>Rhaphostomella spinigera  Lorenz, 1886</td>
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<td>Schizomavella porifera  (Smitt, 1867)</td>
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<td>Schizoporella stylifera  (Levensen, 1836)</td>
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<td>Scrupocellaria scabra  (van Beneden, 1844)</td>
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<td>Scrupocellaria scabra paenulata  Norman, 1913</td>
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<td>Smittina arctica  (Norman, 1894)</td>
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<td>Smittina bella  (Busk, 1950)</td>
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<td>Smittina majuscula  (Smitt, 1867)</td>
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<td>Stephanosella biaperta  (Michelin, 1845)</td>
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<td>Stomachetosella cruenta  (Norman, 1864)</td>
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<td>Stomachetosella distincta  Osburn, 1950</td>
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<td>Stomachetosella sinuosata  (Busk, 1960)</td>
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<td>Tegella arctica  (d'Orbigny, 1851)</td>
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<td>Tegella armifera  (Hincks, 1830)</td>
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<td>Tegella magnipora  Osburn, 1950</td>
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TEGELLA UNICORNIS (FLEMING, 1828)
TERMINOFLUSTRA MEMBRANACEO-TRUNCATA (SMITT, 1867)
TRICELLARIA ERECTA (ROBERTSON, 1900)
TUBULIPORA FLABELLARIS (FABRICIUS, 1780)
UMBONULA ARCTICA (M. SARS, 1851)
UMBONULA PATENS (SMITT, 1867)
VESICULARIA FASCICULATA SOULE, 1953
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PHYLUM CHORDATA

AMAROUCIUM FRAGILE REDIKORZEV, 1927
APLIDIOPSIS PANNOSUM (RITTER, 1999)
ASCIOIA CALLOSA STIMPSON, 1852
BOLTENIA ECHINATA (LINNAEUS, 1767)
* BOLTENIA CVIFERA (LINNAEUS, 1767)
CHELYOSOMA MACLEAYANUM BRODERIP + SOWYRBY
CNEMIDOCARPA RHIZOPUS (REDIKORZEV, 1907)
DENDRODOA GROSSULARIA (VAN BURDEN, 1946)
DENDRODOA PULCHELLA (VERRILL, 1971)
DIOEMNUM ALBIDUM (VERRILL, 1971)
EUGYRA GLUTINANS (MOLLER, 1842)
* HALOCYNTHIA AURANTIUM (PALLAS, 1737)
MOLGULA COMPLANATA ALDER + HANCOCK, 1879
MOLGULA GRIFFIHSI (MACLEAY, 1825)
MOLGULA RETORTIFORMIS VERRILL, 1871
MOLGULA OREGONIA RITTER, 1913
MOLGULA SIPHONALIS M. SARS, 1859
* PELONAIA CORRUGATA GOODEX + FORBES, 1841
POLYCARPA FIBROSA (STIMPSON, 1852)
* RHIZOMOLGULA GLOBULARIS (PALLAS, 1776)
STYELA CORIACEA (ALDER + HANCOCK, 1849)
STYELA RUSTICA MACRETERON RITTER, 1913
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CERIANTHUS BOREALIS VERRILL, 1873
GERSEMA FRUTICOSA (M. SARS, 1860)
* GERSEMA RUROFORMIS (PALLAS)
HALCAMPA CUODECINCIRATA (M. SARS, 1851)
PSEUDOPHELLIA ARCTICA VERRILL, 1869
STOMPHIA COCCINEA (MULLER, 1776)
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CAMPANULARIA GROENLANDIA LEVINSEN, 1893
CORYMORPHA GROENLANDICA (ALLMAN, 1876)
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GONOTHRACEA LOYENI (ALLMAN, 1876)
GRAMMAREA IMMERSA NUTTING, 1901
HYDRACTINA ALLMANI BONNEVIE, 1898
LAFOEA GRACILLIMA (ALDER, 1856)
LAFOEINA MAXIMA LEVINSEN, 1893
OBELIA LONGISSIMA (PALLAS, 1766)
OPERCULARELLA LACERATA (JOHNSTON, 1847)
SERTULARELLA TRICUSPIDATA (ALDER, 1856)
THUIARIA ALTERNITHECA LEVINSEN, 1893
THUIARIA ELEGANS KIRCHENPAUER,
THUIARIA LONCHITIS (ELLIS + SOLANDER, 1786
TUBULARIA INDIVISA LINNAEUS, 1758
* TUBULARIA REGALIS BOECK, 1860
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ASTEROIDEA

C * BATHYASTER VEXILLIFER (THOMSON, 1873)
C * CROSSASTER PAPPOSUS (LINNAEUS, 1767)
C * CTENODISCUS CRISPATUS (RETZIUS, 1805)
    HENRICIA SANGUINCENTA (MULLER, 1776)
C * HYMENASTER PELLUCIDUS THOMSON, 1873
    ICASTERIAS PANOPLA (STUXBERG, 1878)
    LEPTASTERIAS ARCTICA (MURDOCH, 1895)
    LEPTASTERIAS GROENLANDICA (STEENSTRUP, 1857)
    LEPTASTERIAS POLARIS (MULLER + TROSCHEL, 1842)
C * LEFTYCHASTER ARCTICUS (M. SARS, 1851)
C * LOPHASTER FURCIFER (DUBEN + KOREN, 1946)
    PONTASTER TENUISPINUS (DUBEN + KOREN, 1946)
    PORANIOMORPHA BICENS MORTENSEN, 1932
G * PORANIOMORPHA TUMIDA (STUXBERG, 1878)
    PORANIOMORPHA TUMIDA TUBERCULATA DANIELSSSEN + KOREN, 1884
C * PTEPASTER OBSCURUS (PERRIER, 1891)
    SOLASTER CAWSONI VERRILL, 1880
    SOLASTER ENOECA (LINNAEUS, 1771)
C * URASTERIAS LINCKI (MULLER + TROSCHEL, 1842)
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CRINOIDEA

*Heliometra Glacialis* (Owen, 1833)

*Bathyocrinus Carpenteri* (Danielssen + Koren, 1877)
ARCTIC SPECIES LIST

PHYLUM ECHINODERMATA

ECHINOIDEA

C * STRONGYLOCENTROTUS DROEBACHIENSIS (MULLER, 1776)
STRONGYLOCENTROTUS PALLIDUS (G. SARS, 1971)
ARCTIC SPECIES LIST

PHYLUM ECHINODERMATA

HOLOTHUROIDEA

CUCUMARIA FRONDOSA (GUNNERUS, 1770)
ELPIDIA GLACIALIS THEEL, 1876
KOLGA HYALINA DANIELSSEN + KOREN, 1882
MOLPADIA BOREALE (M. SARS, 1861)
C Myriotrochus rinkii Steenstrup, 1951
PSOLUS FABRICII (DUBEN + KOREN, 1846)
C * PSOLUS PERONI BELL, 1882
C * PSOLUS PHANTAPUS (STRUSSENFELDT, 1767)
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PHYLUM ECHINODERMATA

OPHIUROIDEA

C * AMPHIODIA CRATEROMETA CLARK, 1911
C * AMPHIURA PSILOPORA CLARK, 1911
C * AMPHIURA SUNDEVALLI (MULLER + TROSCHEL, 1842)
C * GORGONOCEPHALUS ARCTICUS (LEACH, 1819)
* GORGONOCEPHALUS CARYI (LYMAN, 1860)
C * OPHIACANTHA BICENTATA (REITZIUS, 1805)
C * OPHIODECTEN SERICEUM (FORBES, 1852)
* OPHIOPHOLIS ACULEATA (LINNAEUS, 1766)
C * OPHIOSCOLEX BOREALIS DANIELSSEN + KOREN, 1877
* OPHIOSCOLEX GLACIALIS MULLER + TROSCHEL, 1842
* OPHIURA NOOSA LUTKEN, 1954
* OPHIURA ROBUSTA (AYRES, 1851)
C * OPHIURA SARSII LUTKEN, 1854
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ECHIURUS ECHIURUS (PALLAS, 1774)
ECHIURUS ECHIURUS ALASKANUS FISHER, 1946
HAMINGIA ARCTICA DANIELSSEN + KOREN, 1881
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PHYLUM ENTOPROCTA

BARENTSIA GORBUNOVI KLUGE, 1946
CORIELLA STOLONATA KLUGE, 1946
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PHYLUM MOLLUSCA

AMPHINEURA

AMICULA VESTITA BRODERIP + SOWERBY, 1829
ISCHNOCHITON ALBUS (LINNAEUS, 1767)
TONICELLA VARMOREA (FABRICIUS, 1780)
TONICELLA RUBRA (LINNAEUS, 1757)
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PHYLUM MOLLUSCA

CEPHALOPODA

BENTHOCTOPUS HOKKAIDENSIS (BERRY, 1921)
GONATUS FABRICII (LICHENSTEIN, 1818)
OCTOPUS ARCTICUS PROSCH, 1947
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PHYLUM MOLLUSCA

GASTROPODA--OPISTHOBRANCHIA

AEOLIDIA PAPILLOSA (LINNAEUS, 1761)
ALOISA ZETLANDICA (ALDER + HANCOCK, 1854)
CORYPHELLA SALMONACEA (COUTHOUY, 1839)
C * CYLICHNA ALBA (BROWN, 1827)
C * CYLICHNA CCCULTA MIGHELS + ADAMS, 1842
DENDRONOTUS DALLI BERGH, 1879
DENDRONOTUS FRONOSUS (ASCANIUS, 1774)
C * DIAPHANA MINUTA BROWN, 1827
* HAMINOEA SOLITARIA (SAY, 1822)
ODOSTOMIA CASSANDRA DALL + BARTSCH, 1913
C * PHILINE FINMARCHICA M. SARS, 1879
C * PHILINE LIMA (BROWN, 1827)
C * PHILINE PRUINOSA (CLARK, 1827)
C * RETUSA OBTUSA (MONTAGU, 1807)
RETUSA UMBILICATA (MONTAGU, 1803)
ARCTIC SPECIES LIST

PHYLUM MOLLUSCA

GASTROPODA—PROCOSBRANCHIA

ACMAEA RUBELLA (FABRICIUS, 1790)
ACMAEA TESTUDINALIS (MULLER, 1776)
C * ADMETE COUTHOUYI (JAY, 1839)
ADMETE REGINA DALL, 1911
* ALVANIA CRUENTA
C * ALVANIA JANMAYENI (FRIELE, 1878)
ALVANIA KAPLINI CLARKE, 1963
ALVANIA WYVILLETHOMSONI (FRIELE, 1877)
C * AMAUROPSIS PURPUREA DALL, 1971
AQUILONARIA TURNEPI DALL, 1887
C * BERINGIUS BEHRINGII (MIDDENDORFF, 1843)
BERINGIUS MALLEATUS (DALL, 1894)
BERINGIUS STIMPSONI (GOULD, 1860)
Boreotrophon Beringi (Dall, 1902)
C * Boreotrophon Clathratus (Linnaeus, 1758)
C * Boreotrophon Muriciformis (Dall, 1877)
* Boreotrophon Pacificus (Dall, 1902)
Boreotrophon Truncatus Strom, 1763
C * Buccinum Angulosum GRAY, 1839
Buccinum Ciliatum Fabricius, 1780
Buccinum Cyanenum (Bruguiere, 1792)
Buccinum Fringillum Dall, 1977
C * Buccinum Glaciale Linnaeus, 1761
Buccinum Hydrophanum Hancock, 1846
Buccinum Maltzani Pfeffer, 1896
Buccinum Moerchi Friele, 1877
Buccinum Normale Dall, 1885
Buccinum Cnismatocleura Dall, 1919
C * Buccinum Flectrum Stimpson, 1865
Buccinum Phyesmatum Dall, 1919
Buccinum Polare Gray, 1839
C * Buccinum Sclarifcrme Moller, 1943
* Buccinum Tenue Gray, 1839
Buccinum Undatum Linnaeus, 1758
Bulbus Shithii (Brown, 1839)
Capula Acmaea Radiata (M. Sars, 1851)
* Cingula Castanea (Moller, 1843)
Cingula Moerchi Collin, 1887
Colus Capponius (Dall, 1919)
Colus (Anomalosifho) Dautzenberghi (Dall, 1916)
Colus Eychus (Dall, 1907)
Colus Hunkinsi Clarke, 1962
Colus (Anomalosifho) Martensi (Krause, 1885)
C * Colus Purpureus (Verrill, 1882)
C * Colus Roseus (Dall, 1877)
C * Colus Spitzbergensis (Reeve, 1855)
C * Colus Togatus (Morch, 1869)
ARCTIC SPECIES LIST

CREPIDULA GRANOIS MIDDENDORFF, 1849
C * EPITONIUM GREENLANDICUM (PERRY, 1811)
* HYPOPODA TOTTENI MORRISON, 1954
C * LEPETA CAECA (MULLER, 1776)
MARGARITES AVENOSOKI MACTIGINITIC, 1959
C * MARGARITES COSTALIS (GOUL, 1841)
MARGARITES FRIGICUS DALL, 1919
C * MARGARITES GIGANTEUS (LECHE, 1878)
* MARGARITES HELICINUS (PHIPPS, 1774)
* MARGARITES OLIVACEUS (BROWN, 1827)
MARGARITES PRISILLOFFENSI DALL, 1919
MARGARITES UMBILICALIS (BRODERIP + SOWERBY, 1829)
MARGARITES VAHLI (MOLLER, 1842)
C * MARGARITES VORTICIFERA (DALL, 1873)
C * MARSENINA GLABRA (COUTHOUY, 1838)
MELLELLIA COSTULATA (MOLLER, 1842)
C * NEPTUNEA CLAUSA BROERIP + SOWERBY, 1829
NEPTUNEA BERINGIANA (MIDDENDORFF, 1849)
C * NEPTUNEA HEROS (GRAY, 1830)
NEPTUNEA LYRATA (G. BELLIN, 1791)
C * NEPTUNEA VENTRICOSA (G. BELLIN, 1791)
C * OENOPOTA ARCTICA (ADAMS, 1855)
C * OENOPOTA BICARINATA (COUTHOUY, 1838)
OENOPOTA CINEREA (MOLLER, 1842)
C * OENOPOTA EECUSSATA (COUTHOUY, 1839)
C * OENOPOTA ELEGANS (MOLLER, 1842)
C * OENOPOTA HARPA (DALL, 1885)
OENOPOTA PAPULARIA (COUTHOUY, 1838)
C * OENOPOTA IMPRESSA (MORCH, 1869)
* OENOPOTA INCISA (VERRILL, 1882)
C * OENOPOTA INEQUITA (DALL, 1919)
OENOPOTA NIZANENSIS (DALL, 1919)
C * OENOPOTA NOVA JASEMILIENSIS (LECHE, 1873)
OENOPOTA OBLIQUA (G. SARS, 1878)
OENOPOTA PYRAMIDALIS (STROM, 1788)
C * OENOPOTA RETICULATA (BROWN, 1827)
OENOPOTA TENUICOSTATA (G. SARS, 1878)
* OENOPOTA TURRICALA (MONTAGU, 1803)
ONCHIOIOPSIS GLACIALIS (G. SARS, 1851)
PHELICUS JOHANSEN (DALL, 1919)
C * PHELICUS KROYERI (MOLLER, 1842)
PHELICUS VERKRUZENI (KOBELT, 1876)
C * POLINICES PALLIDUS (BROERIP + SOWERBY, 1829)
C * PROPEBELA GOULDI (VERRILL, 1882)
PROPEBELA MTRULA (DALL, 1919)
PROPEBELA MUROCHIANA (DALL, 1935)
PROPEBELA TENUILIPATA (DALL, 1871)
C * PYCHATRACTUS OCCIDENTALIS STEARS, 1873
FUNCTURELLA NOACHINA (LINNAEUS, 1771)
C * SOLARIELLA OBSURA (COUTHOUY, 1839)
C * SOLARIELLA VARICSSA (MIGHELS + ADAMS, 1842)
C * TACHYRHYNCHUS ERCSIS (COUTHOUY, 1838)
ARCTIC SPECIES LIST

C * TACHYRHYNCHUS RETICULATUS (MIGUELS + ADAMS, 1842)
TARANIS AMOENA (SARS, 1873)
TRICHOTROPIS BIGARINATA (SOWERBY, 1825)
C * TRICHOTROPIS BOREALIS BRODERIP + SOWERBY, 1829
TRICHOTROPIS KROYERI PHILIPPI, 1848
TRIPHORA PERVERSA (LINNAEUS, 1758)
TURRITELLOPSIS ACICULA (STIMPSON, 1851)
VELUTINA LANIGERA MOLLER, 1842
C * VELUTINA Plicatilis (MULLER, 1776)
C * VELUTINA UNDATA (BROWN, 1839)
C * VELUTINA VELUTINA (MULLER, 1776)
VOLUTOPSIS BEHRINGI (MIDDENDORFF, 1849)
C * VOLUTOPSIS CASTANEA (MÖRCH, 1858)
C * VOLUTOPSIS (PYRULOFUSUS) DEFORMIS (REEVE, 1847)
VOLUTOPSIS STEFANSSONI DALL, 1919
PHYLUM MOLLUSCA

PELECYPoda

ASTARTE (ASTARTE) ALASKENSIS DALL, 1903
C * ASTARTE (TRIDONTA) BOREALIS (SCHUMACHER, 1817)
C * ASTARTE (ASTARTE) CRENATA (GRAY, 1824)
C * ASTARTE (GICTOCYMA) ESQUIMALTI (BAIRD, 1863)
C * ASTARTE (TRIDONTA) MONTAGUI (DILLWYN, 1817)
ASTARTE (ASTARTE) POLARIS DALL, 1903
* ASTARTE VERNICOSA DALL, 1903
* AXINOPSIDA ORBICULATA (G. SARS, 1878)
AXINOPSIDA SERRICATA (CARPENTER, 1864)
* BATHYARCA FRIELEI (FRIELE, 1877)
C * BATHYARCA GLACIALIS (GRAY, 1824)
C * BATHYARCA RARIDENTATA (WOOD, 1840)
CHLAMYS ISLANICA (MULLER, 1776)
CHLAMYS PUSIIDA (HINOS, 1845)
C * CLINOCARDIUM CILIATUM (FABRICIUS, 1780)
C * CRENELLA ECUSATA (MONTAGU, 1809)
C * CUSPIDARIA GLACIALIS (G. SARS, 1878)
C * CUSPIDARIA SUBTORTA (G. SARS, 1878)
CYCLOCARDIA BOREALIS (CONRAD, 1831)
CYCLOCARDIA CRASSIJENS (BRODERIP * SOWERBY, 1829)
C * CYCLOCARDIA (CYCLOCARDIA) CREBRICOSTATA (KRAUSE, 1885)
C * CYCLOPECTEN GREENLANDICUS (SOWERBY, 1842)
C * CYRTODARIA KURRIANA DUNKER, 1862
C * DACTYDIUM (DACTYDIUM) VITREUM (MOLLER, 1842)
DIFLODON ALEUTICA DALL, 1901
C * HIATELLA ARCTICA (LINNAEUS, 1767)
HYALOPECTEN FRIGIOUS (JESEN, 1912)
LIQYMA BECKII DALL, 1870
C * LIQYMA FLUCTUOSA (GOULD, 1841)
C * LİMATULA HYPER5OREA JENSEN, 1905
C * LİMOCYMA VIRIOIS DALL, 1871
C * LYONSIA (LYONSIA) ARENOSA (MOLLER, 1842)
LYONSIA NORWEGICA (GMELIN, 1790)
C * LYONSIELLA (POLICORYDA) USCHAKOVI GORJUNOV, 1946
C * MACOMA BALTICA (LINNAEUS, 1758)
C * MACOMA (MACOMA) CALCAREA (GMELIN, 1791)
MACOMA LAMA BARTSCH, 1929
C * MACOMA (MACOMA) LOVENI (JENSEN, 1905)
MACOMA MICCENDORFFI DALL, 1884
C * MACOMA (MACOMA) MOESTA (DESHAYES, 1855)
MACOMA MOESTA ALASKANA DALL, 1900
MACOMA OBILIQUA (SOWERBY, 1817)
* MACOMA TORELLI (STEENSTRUP, 1832)
C * MALLETIA AYSSOPOLARIS CLARKE, 1960
C * MONTACUTA DAWSONI JEFFREYS, 1863
C * MUSCULUS (MUSCULUS) DISCOSS (LINNAEUS, 1767)
C * MUSCULUS (MUSCULUS) CORRUGATUS (STIMPSCH, 1851)
ARCTIC SPECIES LIST

C * MUSCULUS (MUSCULUS) NIGER (GRAY, 1824)
   MUSCULUS ELEGANS (EICHWALD, 1871)
   MUSCULUS JAPONICA (JAY, 1856)
C * MYA (MYA) PSEUDOARENARIA SCHLESCH, 1931
C * MYA (MYA) TRUNCATA LINNAEUS, 1758
C * MYSELLA MALTZANI JERKRUZEN, 1876
C * MYSELLA (MYSELLA) PLANATA (DALL, 1885)
C * MYSELLA (FOCHEFORTIA) TUMIJA (CARPENTER, 1864)
C * MYTILUS ECULIS LINNAEUS, 1758
   NEFEROMYA COMPRESSA (DALL, 1899)
C * NUCULA (LEIONUCULA) BELLOTII ADAMS, 1856
   NUCULA TENUIS (MONTAGU, 1906)
C * NUCULA (NUCULA) ZOPHOS CLARKE, 1860
C * NUCULANA (NUCULANA) MINUTA (FAVRICTIUS, 1775)
C * NUCULANA (NUCULANA) PEPNULA (MULLER, 1779)
C * NUCULANA (NUCULANA) RADIATA (KRAUSE, 1885)
C * PANOMYA (PANDORELLA) GLACIALIS LEACH, 1819
   PANOMYA AMPOLA DALL, 1898
   PANOMYA ARCTICA (LAMARCK, 1819)
   PENITELLA GABBI (TRYON, 1863)
   PERILOMA ABYSSORUM BUSH, 1893
C * PORTLANDIA (PORTLANDIA) ARCTICA (GRAY, 1824)
C * PORTLANDIA (YOLDIA) FRIGIDA (TORELL, 1859)
C * PORTLANDIA (YOLDIELLA) FRATENA (VERRILL + BUSH, 1898)
   PORTLANDIA GLACIALIS (GRAY, 1828)
C * PORTLANDIA (YOLDIELLA) INTERMEDIA (M. SARS, 1865)
C * PORTLANDIA (YOLDIELLA) LENTICULA (MOLLER, 1842)
C * PORTLANDIA (LEDELLA) TAMARA GORBUNOV, 1946
C * SERPipes GROENLANDICUS (BRUGUIERE, 1739)
   THRACIA (LAMPEIA) ADAMSI MACGINITIE, 1959
C * THRACIA (THRACIA) DEVEXA G. SARS, 1873
C * THRACIA (THRACIA) MYOPSIS MOLLER, 1842
   THYASIRA (THYASIRA) EQUALIS (VERRILL + BUSH, 1898)
C * THYASIRA (THYASIRA) GOULDI (PHILIPPI, 1845)
C * YOLDIA (YOLDIA) HYPERBOREA TORELL, 1859
   YOLDIA LIMATULA (SAY, 1831)
   YOLDIA (YOLDIA) MYALIS (COUTHOUY, 1838)
C * YOLDIA (CHESTERIUM) SCISSLRATA DALL, 1897
ARCTIC SPECIES LIST

PHYLUM MOLLUSCA

SCAPHOPODA

* Siphonodentalium lobatum (Sowerby, 1860)
PHYLUM NEMERTINEA

AMPHIPORUS ANGULATU$ (FABRICIUS, 1774)
AMPHIPORUS FORMIDABILIS GRIFFIN, 1898
AMPHIPORUS GROENLANDICUS (OERSTED, 1844)
AMPHIPORUS IMPARISPINOSUS GRIFFIN, 1838
AMPHIPORUS LACTIFLOREUS (JOHNSTON, 1828)
AMPHIPORUS MACRANTHUS COE, 1905
AMPHIPORUS PACIFICUS COE, 1905
CEREBRATULUS FUSCUS (MCINTOSH, 1873)
CEREBRATULUS MARGINATUS RENIER, 1804
EMPLECTONEMA GRACILE (JOHNSTON, 1837)
LINEUS RUBER (MULLER, 1771)
MICRURA ALASKENSIS COE, 1901
MICRURA IMPRESSA (STIMPSON, 1857)
MICRURA PURPUREA (DALYELL, 1853)
NEMERTOPSIS GRACILIS COE, 1904
PARANEMERTES PEREGRINA COE, 1901
TETRASTEMMA ABERRANS COE, 1901
TETRASTEMMA BIGOLOR COE, 1901
TETRASTEMMA CANDIDUM (MULLER, 1774)
TETRASTEMMA CORONATUM (QUATREFAGES, 1846)
TUBULANUS ALBICINCTUS (COE, 1904)
TUBULANUS ANNULATUS (MONTAGU, 1804)
TUBULANUS CAPISTRATUS (COE, 1901)
TUBULANUS FRENATUS (COE, 1904)
ARCTIC SPECIES LIST

PHYLUM PLATYHELMINTHES

ACEROTISA ARCTICA HYMAN, 1953
NOTOPLANA ATOMATA (MULLER, 1776)
ARCTIC SPECIES LIST

PHYLUM PORIFERA

APLYSILLA GLACIALIS (MERCJKOWSKY, 1873)
CAULOPHACUS ARCTICUS HANSEN, 1885
CHOANITIES LUTKENII (SCHMIDT, 1870)
CLANORHIZA ARCTICA BURTON, 1946
CLANORHIZA GELIDA LUNDBECK, 1905
CRANIella CRANIANA DE LAUBENFELS, 1953
ECHINOCERATIA BERINGENSIS (HENTSCHEL, 1929)
FORCEPIA TOPSEN'TI LUNDBECK, 1905
GEODIA PHLEGRAEI (SOLLAS, 1880)
HALICHRONDIA LAMBEI BRONNOST, 1933
* HALICLONA GRACILIS (MIKLUCHO-MACLAY, 1870)
* HALICLONA RUFESCENS (LAMBE, 1933)
LEUCONIA ALASKENSIS DE LAUBENFELS, 1953
LEUCONIA ANALAS (MONTAGU, 1819)
MYXILLA INCURVATA (JOHNSTON, 1842)
PELLINA SITIENS (SCHMIDT, 1870)
PHAKELLIA VARIABILIS (VOSMAER, 1882)
POLYMASTIA ANDRICA DE LAUBENFELS, 1949
POLYMASTIA SOL (SCHMIDT)
TENTORIUM SEMISUBERITES (SCHMIDT, 1879)
THENEA ABYSSORUM KOLTUN, 1964
TOPSENTIA DISPARILIS (LAMBE, 1894)
WIGGINSIA WIGGINSI DE LAUBENFELS, 1953
ARCTIC SPECIES LIST

PHYLUM PRIAPULIDA

* HALICRYPTUS SPINULOSUS VON SIEBOLD, 1849
* PRIAPULUS BICAUDATUS DANIELSSEN, 1868
* PRIAPULUS CAUDATUS LAMARCK, 1816
  PRIAPULUS HUMANUS (LINNAEUS, 1758)
ARCTIC SPECIES LIST

PHYLUM PROTOZOA

FORAMINIFERIDA

ADERCOTRYMA GLOMERATUM (BRADY, 1878)
ALVEOLOPHAGMUM CRASSIMARGO (NORMAN, 1892)
ALVEOLOPHAGMUM JEFFREYSI (WILLIAMSON, 1898)
AMMOTIUM CASSIS (PARKER, 1870)
ANGULOSERINA FLUENS TODD, 1947
ASTACOLUS HYALACRULUS LOEBLICH + TAPPAN, 1953
ASTPONION GALLCWAYI LOEBLICH + TAPPAN, 1953
BUFFELLA FRIGIDA (CUSHMAN, 1922)
BUFFELLA INUSITATA ANDERSEN, 1952
BULIMINA EXILIS BRADY, 1894
BULIMINA PYRULA O ORBIGNY, 1846
CASSIDULINA ISLANDICA NORVANG, 1945
CASSIDULINA GRASSA O ORBIGNY, 1839
CASSIDULINA LAEVIGATA O ORBIGNY, 1826
CASSIDULINA NORCROSSI CUSHMAN, 1933
CASSIDULINA TERTIS TAPPAN, 1951
CORNUSPIRA FOLIACEA (PHILIPPI, 1844)
CORNUSPIRA INVOLVENS (REUSS, 1850)
DENTALINA BAGGI GALLOWAY + WISSLER, 1927
DENTALINA FROBISHERENSIS LOEBLICH + TAPPAN, 1953
DENTALINA ITTAI LOEBLICH + TAPPAN, 1953
EGGERELLA ADGENA (CUSHMAN, 1922)
ELPHIDIELLA ARCTICA (PARKER + JONES, 1854)
ELPHIDIELLA GROENLANDICA (CUSHMAN, 1933)
ELPHIIDUM BARTLETTI CUSHMAN, 1933
ELPHIIDUM CLAVATUM CUSHMAN, 1930
ELPHIIDUM FRIGIDUM CUSHMAN, 1933
ELPHIIDUM ORBICULARE (BRADY, 1831)
ELPHIIDUM SUBARCTICUM CUSHMAN, 1944
FISSURINA CUCURBITASEMA LOEBLICH + TAPPAN, 1953
FISSURINA LUCIDA (WILLIAMSON, 1849)
FISSURINA MARGINATA (MONTAGU, 1803)
FISSURINA SEMIMARGINATA (REUSS, 1870)
FISSURINA SERRATA (SCHLUYBERGER, 1894)
FISSURINA VENTRICOSA (WIESNER, 1931)
GLOANULINA LAEVIGATA O ORBIGNY, 1826
GLOBOBULIMINA AURICULATA ARCTICA HOGlund, 1947
GORDIOSPIRA ARCTICA CUSHMAN, 1933
HIPPOCRESSPINA INDIVISA PARKER, 1970
LAGENA APICPLEURA LOEBLICH + TAPPAN, 1953
LAGENA FLATULENTA LOEBLICH + TAPPAN, 1953
LAGENA GRACILLIMA (SEQUENZA, 1862)
LAGENA LAEVIGATA (REUSS, 1849)
LAGENA LAEVIS (MONTAGU, 1803)
LAGENA MOLLIS CUSHMAN, 1944
LAGENA SEQUINATA WRIGHT, 1836
LAGENA SETIGERA MILLET, 1901
ARCTIC SPECIES LIST

LARYNGOSIGMA HYALASCIDIA LOEBLICH + TAPPAN, 1953
LARYNGOSIGMA WILLIAMSONI (TERQUEM, 1878)
MILIOLINELLA CHUKCHIENSIS LOEBLICH + TAPPAN, 1953
NODOSARIA AEQUALIS (REUSS, 1863)
NODOSARIA EMPHYSACOCTA LOEBLICH + TAPPAN, 1953
NONION LABRADORICUM (JAWSON, 1860)
NONIONELLA AURICULA HERON-ALLEN + EARLAND, 1930
OOLINA CALIGERA (WIESNER, 1931)
OOLINA COSTATA (WILLIAMSON, 1858)
OOLINA HEXAGONA (WILLIAMSON, 1858)
OOLINA LINEATO-PUNCTATA (HERON-ALLEN + EARLAND, 1922)
OOLINA MELO O ORBIGNY, 1839
OOLINA SQUAMOSA (MONTAGU, 1803)
OOLINA STRIATOPUNCTATA (PARKER + JONES, 1965)
PARAFISSURINA HIMATIOSTOMA LOEBLICH + TAPPAN, 1953
PATELLINA CORRUGATA WILLIAMSON, 1858
PATEORIS HAVERINCIDES (RHUMLER, 1936)
POLYMORPHINA LANCEOLATA REUSS, 1851
PROTOSCHISTA FINCENS (PARKER, 1870)
PYRGO WILLIAMSONI (SILVESTRI, 1923)
QUINQUELOCULINA AGGLUTINATA CUSHMAN, 1917
QUINQUELOCULINA ARCTICA CUSHMAN, 1933
QUINQUELOCULINA STALKERI LOEBLICH + TAPPAN, 1953
RECOVOLICES TURBINATUS (BRADY, 1881)
RECOVOLICES ARCTICA BRADY, 1891
RECOVOLICES CURTUS CUSHMAN, 1920
RECOVOLICES SCORPIUS MONTFORT, 1808
ROBERTINCIDES CHAPLOTTENSIS (CUSHMAN, 1925)
SCUTULORIS TEGMINIS LOEBLICH + TAPPAN, 1953
SPIROPLECTAMMINA BIFORMIS (PARKER + JONES, 1865)
TEXTULARIA TORQUATA PARKER, 1952
TRILOCULINA TRIHEDRA LOEBLICH + TAPPAN, 1953
TROCHAMMINA NANA (BRADY, 1881)
TROCHAMMINA ROTALIFORMIS WRIGHT, 1911
TRUNCATULINA LOBATULA WALKER + JACOB, 1798
TRUNCATULINA PYGMOEA HANTKEN, 1875
ARCTIC SPECIES LIST

PHYLUM SIPUNCULIDA

* GOLFINIA MARGARITACEA (SARS, 1851)
* PHASCOLION STROEBEI (MONTAGU, 1804)
FINAL REPORT

Contract No. 03-5-022-68
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Summarization of existing literature and
unpublished data on the distribution, abundance,
and life histories of benthic organisms

Andrew G. Carey, Jr., Principal Investigator
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1 January 1977
<table>
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<th>Species distribution charts</th>
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<td>Annelida: Polychaeta</td>
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SPECIES DISTRIBUTION

Distributional information has been included for 370 benthic organisms representing the following invertebrate groups:

Annelida - Polychaeta

Arthropoda - Amphipoda
Copepoda (Harpacticoida)
Cumacea
Decapoda
Isopoda

Echinodermata - Asteroidea
Crinoidea
Echinoidea
Holothuroidea
Ophiuroidea

Mollusca - Gastropoda
Pelecypoda

Only the benthic invertebrates reported by investigators currently active in the Beaufort Sea were selected for plotting on distribution charts. These organisms include those collected by:

Dr. A.G. Carey, Jr. Oregon State University
-continental shelf and slope stations between Cape Halkett and Barter Island

Dr. H.M. Feder, University of Alaska
-Prudhoe Bay area

Dr. J.W. Wacasey, Dept. of Environment, Canada
-Eskimo Lakes region

Additional distributional information has been incorporated, however, for those invertebrates which have also been found by the University of Alaska around the Colville River delta, or which have been reported from collections made by Dr. G.E. MacGinitie near the Naval Arctic Research Laboratory at Point Barrow.

The organisms which have distribution charts have been indicated on the species list with a capital "C" preceding the species name.
Species Distributions:

Annelida -- Polychaeta
Aglacophamus malmgreni (Theel, 1879)
Aglaophamus malmgreni (Theel, 1879)
Amagus auricula
Malmgren, 1866
Ampharete arctica Malmgren, 1866
Ampharete vega (Wiren, 1883)
Ampharete vega (Wiren, 1883)
Amphictheis sundevalli Malmgren, 1866
Antinoella sarsi Malmgren, 1865
Artacama proboscidea Malmgren, 1866
Capitella capitata (Fabricius, 1780)
Capitella capitata (Fabricius, 1780)
Chone dunuri Malmgren, 1867
Cirratulus cirratus (Muller, 1776)
Cossura longocirrata Webster + Benedict, 1887
Eteone longa (Fabricius, 1780)
Eteone longa (Fabricius, 1780)
Euchone papillosa (Sars, 1851)
Glycanostomum pallescens (Theel, 1879)
Harmothoe imbricata (Linnaeus, 1767)
Laonice cirrata (Sars, 1851)
Leiochone polaris (Theel, 1879)
Leiochone polaris (Theel, 1879)
Lumbriclymene minor Arwidsson, 1907
Lumbrineris minuta (Theel, 1879)
Mulinia cristata (Sars, 1851)
Nephtys ciliata (Müller, 1776)
Nephtys longosetosa Oersted, 1843
Nereimyra aphroditoides (Fabricius, 1780)
Nereis zonata Malmgren, 1867
Notoproctus oculatus arctica
Arwidsson, 1907
Onuphis conchylega Sars, 1835
Ophelina abranchiata Støp-Bowitz, 1948
Ophelina cylindricaudatus (Hansen, 1879)
Pectinaria (Cistenides) hyperborea (Malmgren, 1865)
Petaloproctus tenuis (Theel, 1879)
Potyadora quadrilobata Jacobi, 1883
Praxillella praetermissa (Malmgren, 1866)
Prionospio cirrifera Wiren, 1883
Proclea graffii (Langerhans, 1884)
Sabellides borealis Sars, 1856
Scoloplos acutus (Verrill, 1873)
Scoloplos armiger (Müller, 1776)
Scoloplos elongata (Johnson, 1901)
Sigambra tentaculata (Treadwell, 1941)
Sphaerodoropsis minuta (Webster and Benedict, 1887)
Sphaerodoropsis minuta (Webster and Benedict, 1887)
Spio filicornis (Müller, 1776)
Spiro filicornis (Müller, 1776)
Spiro mimus Chamberlin, 1920
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Corvallis, Oregon 97331

1 January 1977
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**Mollusca -- Gastropoda (Opisthobranchia)**
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+ (O = shell only)
Cylichna occulta Mighels + Adams, 1842
Diaphana minuta Brown, 1827
Philine finmarchica M. Sars, 1878
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**Mollusca** -- **Gastropoda** (Prosobranchia)
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Buccinum glaciale Linnaeus, 1761
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( O = shell only)
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Bathyarca raridentata (Wood, 1840)
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[Diagram showing locations and symbols for Cyclopecten groenlandicus]
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Limatula hyperborea Jensen, 1905

(ο = valves only)
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Macoma loveni (Jenness, 1905)
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Malletia abyssopolaris Clarke, 1960

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**Musculus discors** (Linnaeus, 1767)
Mya pseudarenaria Schlesh, 1931

(O = valves only)
Mysella tumida (Carpenter, 1864)
Mytilus edulis Linnaeus, 1758

(volute only)
Mytilus edulis Linnaeus, 1758
Nucula bellotii Adams, 1856
Nucula zophos Clarke, 1960

(valves only)
Nuculana minuta (Fabricius, 1776)
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A. **Listing of Topics**

This section has been provided as a guide for the Bibliography Index included in the next part. It lists the headings included in the index, dividing them into five principal categories:

1. **Systematic Index** - listing all of the faunal groups mentioned specifically in the titles or abstracts of the papers in the bibliography. A 'general topics' section is included for those publications which do not deal with the biota in terms of specific taxa.

2. **General Subjects Index** - dealing with the general research topics covered in the bibliography.

3. **Regional Index** - is divided into terrestrial and marine designations. Although all papers included in the bibliography pertain to some aspect of marine research, many have titles which list only the adjacent land areas.

4. **Expedition Index** - includes all papers resulting from work done on expeditions and research voyages, and from floating ice islands or drift stations.

5. **Ecological Index** - indexes the marine flora and fauna by ecological group.
1. Systematic Index

a. General topics
   - Invertebrates (general)
   - Vertebrates (general)
   - Flora (general)

b. Taxa
   - Foraminifera
   - Radiolaria
   - Porifera
   - Chidaria
   - Turbellaria
   - Rhynchocoela
   - Rotifera
   - Gastrotricha
   - Kinorhyncha
   - Nematoda
   - Polychaeta
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   - Mollusca
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   - Sipunculida
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   - Echinodermata
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   - Pogonophora
   - Ascidiacea

2. General Subject Topics
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   - Ecology
   - Estuaries
   - Evolution
   - Faunal Distribution
   - Fisheries
   - Fossils
   - Histology
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   - Taxonomy
   - Zoogeography

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- Spitzbergen
- Sweden

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- Bering Sea
- Canadian Basin
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b. Marine Designations (cont.)

- Greenland Sea
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- High Latitude Arctic Expeditions (USSR)
- Howgate Polar Expedition, 1877-1878
- "Ingolf" Expedition
- International Polar Year Expedition, 1882-1883
- "Krasin" Voyage
- Lady Franklin Bay Expedition
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- Northern Scientific and Economic Expedition
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- Nekton
- Phytobenthos
- Phytoplankton
- Zooplankton
B. Bibliography Index

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Neiman, 1960
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Popova, 1952
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Propp, 1962
Rusanova, 1963b
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Sailer, 1955
Sars, 1866
Sharanov, 1948
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Soot-Ryen, 1932a
Sparks and Pereyra, 1966
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Tcherniakovsky, 1941
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Grainger, 1964
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Filatova and Zenkevich, 1957
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   Dearborn and Dean, 1969
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   Gur'ianova, 1933a
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Annenkova, 1924
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Annenkova, 1934
Annenkova, 1952
Ashworth, 1910
Augener, 1928
Aurivillius, 1887
Baker and Wong, 1968
Bergstrom, 1914
Berkeley and Berkeley, 1942
Berkeley and Berkeley, 1956
Berkeley and Berkeley, 1958
Berkeley and Berkeley, 1962
Boeck, 1871
Boeck, 1872-1876
Boone, 1920
Bowman and Manning, 1972
Brahm and Mohr, 1962b
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Bray, 1962
Broderip and Sowerby, 1828
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Carlgren, 1902
Carlgren, 1912
Carlgren, 1913
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Carlgren, 1933
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Castillo, 1975
Chamberlin and Stearns, 1963
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Clark, 1963
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Coe, 1905
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Dall, 1902
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Macpherson, 1968
Macpherson, 1971
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Menzies and Mohr, 1962
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Moore, 1906
Moskaler, 1961
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Green, 1960
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Holmquist, 1974
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Linstow, 1900
Loeblich and Tappan, 1953
Mathews, 1964
Neale and Howe, 1973
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Shchedrina, 1938
Shchedrina, 1939
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Shchedrina, 1950
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Tanasiichuk, 1928
Theisen, 1973
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Filatova, 1957a
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Koltun, 1959b
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MacGinitie, 1955
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Odhner, 1921
Ushakov, 1926
Verrill, 1914

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Miloslavskaja, 1958a
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Mohr, 1969a
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Nikolsky, 1965
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Schmitt, 1919
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Tanasiichuk, 1927
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Ushakov, 1928a
Ushakov, 1931
Zenkevich, 1947
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Nematoda

Linstow, 1900

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Shoemaker, 1920

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Gur'ianova, 1928
Ushakov, 1928b

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Iniutkina, 1965
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Clausen, 1963
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Mathews, 1964
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Soot-Ryen, 1932

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    Lomakina, 1964

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    Carlgren, 1902

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    Erseus, 1974
    Holmquist, 1974
    Nurminen, 1973
    Smith and Welch, 1924
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    Annenkova, 1923
    Annenkova, 1924
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D'iakonov, 1938
D'iakonov, 1950a
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D'iakonov, 1954
Filatova, 1957a
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Gur'ianova, 1933d
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Gur'ianova, 1936b
Gur'ianova, 1936f
Gur'ianova, 1946a
Gur'ianova, 1951
Kliuge, 1961
LaRoque, 1953
Lomakina, 1956
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Makarov, 1937a
Pavlovskii, 1955
Shchedrina, 1952a
Shchedrina, 1952b
Shchedrina, 1953
Shchedrina, 1956a
Shimkevich, 1913
Silvertsen, 1932
Skarlato, 1956
Starokadomskii, 1917
Steele and Brunel, 1968b
Ushakov, 1940
Ushakov, 1949
Ushakov, 1950
Ushakov, 1958a
Ushakov, 1958b
Vinogradov, 1956
Zarenkov, 1960
Zarenkov, 1948b
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Zarenkov, 1963
Znamenskii, no date given
Pacific Expedition of the State Hydrological Institute of 1932

Gur'ianova, 1935b

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Sabine, 1824

Pearcy Land Expedition, Fourth (1966)

Tendal, 1970

Peary Relief Expedition

Kliuge, 1908b

"Percei" Voyage

Mesiatsev, 1927

Physiology

Beliaev, 1950

George and Paul, 1970

Mohr, 1969a

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Ellis and Wilce, 1961

Gur'ianova, 1924

Gur'ianova, 1935d

Gur'ianova, 1968

Kuznetsov, 1948b

Kuznetsov, 1960

Meguro et al., 1966

Propp, 1962

Tcherniakovsky, 1941

Ushakov, 1931

Zenkevich, 1947
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Zenkevich, 1948a
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Phytoplankton

Deriugin, 1928
Deriugin, 1930
Dunbar, 1953
Dunbar, 1960
King, 1967
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Mohr, 1969a
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Nikolsky, 1965
Ponomareva, 1949
Soot-Ryen, 1932a
Tcherniakovsky, 1941
Zenkevich, 1947
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"Pinro" Expeditions

Nesis, 1962

Pogonophora

Ivanov, 1956
Moskalev, 1961
Southward, 1962
Ushakov, 1940
Point Barrow Expedition

Dall, 1885a
Dall, 1885b

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Chia, 1970

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Annenkova, 1923
Annenkova, 1924
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Annenkova, 1926
Annenkova, 1929
Annenkova, 1934
Annenkova, 1952
Ashworth, 1910
Augener, 1928
Bergstrom, 1914
Berkeley and Berkeley, 1942
Berkeley and Berkeley, 1956
Berkeley and Berkeley, 1958
Berkeley and Berkeley, 1962
Chamberlin, 1920
Curtis, 1969
Curtis, 1970
Curtis, 1972
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Fauchald, 1963
Gustafson, 1936
Johansson, 1927
Knox, 1959
Mileikovsky, 1968b
Moore, 1906
Murdoch, 1885b
Pettibone, 1949
Pettibone, 1951
Pettibone, 1954
Reish, 1965
Streltzov, 1966a
Streltzov, 1966b
Streltzov, 1966c
Streltzov, 1968
Ushakov, 1948c
Ushakov, 1957
Verrill, 1879a
Wessenberg-Lund, 1950

Porifera

Breitfus, 1898
DeLaubenfels, 1953
Dendy and Frederick, 1924
Koltun, 1959b
Koltun, 1964a
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Lambe, 1900
Tendal, 1970
Verrill, 1879c
Vinogradov, 1956

Priapulida

Fischer, 1929
Murina, 1964
Shapeero, 1962

Pycnogonida

Hedgpeth, 1963
Hilton, 1942
Shimkevich, 1913
Shimkevich, 1929-1930
Vinogradov, 1956

Radiolaria

Brady, 1878

Reproduction and Growth

Barr, 1970
Brattegard, 1966
Chamberlin and Stearns, 1963
Chia, 1970
Chislenko, 1963
Cleaver, 1963
Coe, 1905
Gonor, 1964
Green, 1973
Reproduction and Growth (continued)

Jones, 1960
Kuderskii, 1960
Kuznetsov, 1946
Kuznetsov, 1948a
Kuznetsov, 1948b
Kuznetsov, 1948c
Kuznetsov, 1951
Kuznetsov, 1953
Kuznetsov, 1954
Kuznetsov, 1957
Kuznetsov, 1958
Kuznetsov, 1960
Kuznetsov, 1963a
Kuznetsov, 1963b
Kuznetsov, 1964a
Kuznetsov and Matveeva, 1942
Lomakina, 1958
Lomakina, 1964
MacGinitie, 1955
Mathews, 1964
Mileikovsky, 1960
Mileikovsky, 1969
Mileikovsky, 1970b
Naumov, 1960
Powell and Nickerson, 1965
Sokolov, 1952
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Southward and Southward, 1967
Steele, 1967b
Streltzov, 1966c
Thiesen, 1973
Thorson, 1935
Thorson, 1936
Vinogradov, 1968
Zenkevich, 1935
Zenkevich, 1947

"Requisite" Voyage

U.S. Hydrographic Office, 1955

Rhynchocoela

Coe, 1905
Coe, 1944
Coe, 1952
Ushakov, 1926
Ushakov, 1928b

Robeson Channel

Brady, 1878
Duncan and Sladen, 1881

Rotifera

Remane, 1933

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Gur'ianova, 1935a
Gur'ianova, 1936c
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Russian Drift Stations "North Pole, 2-5"
  Ushakov, 1957

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  Gur'ianova, 1938
  Gur'ianova, 1946b
  Kliuge, 1962
  Shchedrina, 1938
  Shchedrina, 1946
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  Calder, 1970
  Squires, 1968a
  Squires, 1968b

Sampling Gear and Techniques
  Clarke, 1972
  Dearborn and Dean, 1969
  McCauley, 1964a
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  Rusanova, 1963a
  Rusanova, 1963b
  Tcherniakovsky, 1941
  Ushakov, 1948b
  Vilks et al., 1970
"Sarja" Voyage  
Kliuge, 1929

Scandanavia  
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Boeck, 1872-1876

"Sedov" Voyage  
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"Sibiriakov" Voyage  
Gur'ianova, 1936c  
Kliuge, 1962  
Shchedrina, 1936

Sipunculida  
Fischer, 1929  
Gustafson, 1936  
Murina, 1964

Smith Sound  
Brady, 1878  
Duncan and Sladen, 1881  
Miers, 1877

Spitzbergen  
Augener, 1928  
Baranova, 1964  
Boeck, 1871  
Blacker, 1965  
Carlgren, 1902
Spitzbergen (continued)
  Gostilovskaia, 1964
  Kobiakova, 1964
  Koltun, 1964a
  Neale and Howe, 1973
  Nesis, 1959
  Soot-Ryen, 1925
  Steele and Brunei, 1968b

Strait of Belle Isle
  Calder, 1970
  Calder, 1972

"Stranger" Voyage
  Carlgren, 1940

Sweden
  Christiansen, 1968
  Erseus, 1974
  Wahrberg, 1930

Swedish Alaskan Expedition
  Carlgren, 1934

"Taimyr" Voyage
  Gur'ianova, 1936c
  Kliuge, 1929
  Starokadomskii, 1917

Taxonomy
  Abbott, 1961
  Adams, 1855
  Agatep, 1967
Taxonomy (continued)

Annenkova, 1922
Annenkova, 1923
Annenkova, 1924
Annenkova, 1925a
Annenkova, 1925b
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Annenkova, 1929
Annenkova, 1934
Annenkova, 1952
Ashworth, 1910
Augener, 1928
Aurivillius, 1887
Banner, 1947
Banner, 1948
Bergstrom, 1914
Berkeley and Berkeley, 1942
Berkeley and Berkeley, 1956
Berkeley and Berkeley, 1958
Berkeley and Berkeley, 1962
Boeck, 1871
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Bowman and Manning, 1972
Brady, 1878
Bray, 1962
Broch, 1933
Taxonomy (continued)

Bulycheva, 1957
Burukovsky, 1966
Calman, 1920
Carlgren, 1902
Carlgren, 1912
Carlgren, 1913
Carlgren, 1917
Carlgren, 1932
Carlgren, 1933
Carlgren, 1934
Carlgren, 1940
Carlgren, 1942
Carlgren, 1949
Chamberlin, 1920
Clark, 1915
Clark, 1920
Clark, 1921
Clark, 1931
Clark, 1936
Clark, 1941
Clark, 1947
Clark, 1950
Clark, 1963
Clark and Clark, 1967
Clarke, 1960
Clarke, 1962a
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Clausen, 1963
Coan, 1971
Coe, 1905
Coe, 1944
Cowan, 1968
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Curtis, 1969
Cushman, 1920
Cushman, 1948
Dall, 1875
Dall, 1879
Dall, 1885a
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Dall, 1896
Dall, 1902
Dall, 1903
Dall, 1919a
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Summarization of existing literature and unpublished data on the distribution, abundance, and life histories of benthic organisms

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1 January 1977
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C. Annotated Bibliography

The annotated bibliography includes the references in the published and unpublished literature pertaining to benthic research in the Beaufort Sea and other polar regions. This list of works has been assembled from correspondence and library searches, as well as a number of other sources, including Oceanic Abstracts, Biological Abstracts, Arctic Bibliography, and the National Technical Information Service. The specific source is listed at the end of each entry when applicable. Entries which pertain wholly or in part to aspects of the Beaufort Sea benthos are indicated with preceding asterisks.

Presents data on collections of ascidians made in this north coast area. Eight species of the order Enterogona are described and details of anatomy and habitat are tabulated. (Arctic Biblio.)


Lists 23 species of ascidians and tabulates these by station collected, with a brief introduction. (Arctic Biblio.)


Contains descriptions of 21 molluscs (19 described as new) from various seas. Bela arctica, native to arctic seas, is included. (Arctic Biblio.)


Describes two species of elasipodid holothurians, Elpidia glacialis glacialis and Kolga hyalina, specimens of which were collected by Menzie's trawl from drifting station ARLIS II. Drawing and taxonomic notes are included. (Arctic Biblio.)


Summary of a report delivered by the Arctic Institute to the Presidium of the Academy on recent accomplishments: the discovery in 1948-49 of a great submarine mountain range 2.5-30 km in height, extending across the Arctic Basin from the New Siberian Islands to Greenland; discovery of a singular, excessive arctic magnetic anomaly; investigation of marine fauna found in abundance in highest latitudes. (Arctic Biblio.)


Contains a general part (p. 5-21) dealing with the history of faunistic research of these seas; their physico-geographical characteristics; nature
and type composition of fauna; fauna of the various marine zones (littoral, continental shelf, etc). This is followed by an account and description of types, classes, etc., down to and including species (p. 22-229) with notes on biology and ecology, distribution, economic value, etc. The "Atlas" proper consists of 66 plates at the end of the book with illustrations of some 600 species described in the text. An alphabetic index (p. 230-40) of both Russian and Latin names is included. Some 30 specialists (listed) participated in the study under the general editorship of P.V. Ushakov. (Arctic Biblio.)


Contains 27 of the 40 papers presented (some in brief, to be pub. in full elsewhere); several dealing with northern forms or areas. (Arctic Biblio.)


Contains a general description of the geography and natural history of Kovda Sound (about 66°40' N 33°E) Kandalakshskiy Gulf, White Sea; and a list of 84 stations established there in 1912, with their locations, depth, bottom samples and names of marine plants and animals collected on each station. (Arctic Biblio.)


Data on the distribution of Pandalus borealis have been brought up to date, and the factors controlling its distributions (temperature, salinity, substratum and depth) are discussed. An account of the biology of the population off the Northumberland coast is given and compared with accounts of work on other populations. Knowledge of the biology of this species now extends over the entire north-south range in the eastern Atlantic. (Author.)

Eleven species of echinoderms are included with station data and remarks.


Foraminiferal distribution within the Bering Sea is related to the physiography of the adjacent land mass, to sea floor topography, sediment type and oceanography. (Biological Abstracts.)


The intrinsic and extrinsic muscles in Cytheridea papillosa are described and their function discussed. Special attention has been paid to the extrinsic muscles and the scars these muscles form on the valves. (Author.)


Contains a study of faunistic relations of northern sections of the Pacific and Atlantic Oceans as typified by disjoint distribution of the common herring (Culpea harenthus), some other fishes (Gadus morrhua, Salmo, Hippoglossus hippoglossus, etc), some Decapoda (Lithodes maja) and many other marine organisms. A scheme of the development of amphiboreal areas of marine fauna in the Northern Hemisphere is represented (sketch maps 8-11). It is concluded that the contemporary disjoint amphiboreal areas were formed in the Pleiocene epoch through Bering Strait. The migration of the fauna was from the Pacific into Atlantic Ocean along the northern coast of North America. (Arctic Biblio.)


Study on material from the upper 20 cm of sediments, collected in 1937-1938 by the North Pole-1 drifting station, with a general introduction by T. Gorshkova. Location and horizon, as well as nature of bottom, are included in the records of species found. A poverty of species is noted in all samples and horizons with fam. Globigerinidae predominating. Most of the species were carried in the Atlantic current. (Arctic Biblio.)

Contains a list of 11 species of marine polychaetous worms inhabiting all seas along the northern coast of the USSR, Bering Sea and Okhotsk Sea; diagnosis of Brada ochotensis, B. sachalina, B. nuda and B. arctica n. spp. are included. (Arctic Biblio.)


Contains a critical revision of polychaetous genus Brada, with Russian diagnoses of four new species: B. arctica from Novo-Sibirskeye Islands waters, B. nuda native to Beaufort Sea and B. ochotensis and B. sachalinica found in southern part of Sea of Okhotsk. (Arctic Biblio.)


Contains descriptions of five new species of marine polychaetous worms including Terebella hesslei (White Sea), Polycirrus eous (Okhotsk Sea) and Flabelligera similis (Beaufort Sea); together with additional data on distribution of other polychaetes occurring in all seas along the northern coast of the USSR, and in Bering and Okhotsk Seas. (Arctic Biblio.)


Descriptive notes and data on distribution of marine polychaetous worms, Pallasina pennata from Okhotsk Sea and Sternapsis fossor, native to Laptev Sea (77°20' N) and Bering Sea. (Arctic Biblio.)


Pista sachsi n. sp. and Neoamphitrite figulus pacifica n. subsp. are described from the specimens obtained in the Okhotsk Sea, and additional distributional data are given on four other species, occurring in the seas along the northern coast of the USSR. (Arctic Biblio.)


Contains a study of the external anatomy and morphology of a marine polychaetous worm, native to the White Sea, previously described by the author as Terebella hesslei n. sp., in her paper Neues uber die Verbreitung einiger Arten der Polychaeten, 1924, q.v. (Arctic Biblio.)

Contains a study of the families Pectinariidae and Ampharetidae of polychaetous marine worms of Russia with a systematic list of 25 species, including descriptions of six new species, critical notes and data on distribution in the waters along the northern coast of European and Asiatic Russia in Bering and Okhotsk Sea, with lists of localities. (Arctic Biblio.)


Contains Russian and German descriptions of three new species of annelid worms of the fam. Paraonidae, including Paraonis ivanovi n. sp. obtained in northern Bering Sea and Aricidea antennata n. sp. native to Chukchi (71°19'N, 178°12'W) and Okhotsk Seas. Summary in German. (Arctic Biblio.)


Descriptions of eight new species of polychaetes native to Greenland Sea, all arctic seas along the northern coast of USSR and to Okhotsk Sea. (Arctic Biblio.)


Discusses, on pages 272-275, the abundance of invertebrates and changes in density and distribution with depth and sediment type. A table compares the number of species for each phylum in the Chukchi and Beaufort Seas.


Lists arctic brachiopods with locations.

Contains a key, followed by descriptions of the genus Arenicola and five species. *A. marina* (Labrador), *A. claparedii* (Aleutian Islands), and *A. glacialis* (Point Barrow) are included. (Arctic Biblio.)


Includes data on distribution, keys, and descriptions of the species found. In German.


Contains list with synonymy, localities and remarks upon the specimens of one hundred twenty-one (including nine new) species from Kara, Laptev, East Siberian and Chukchi Seas, Bering Strait and Bering Sea; descriptions of new species and new varieties and a list of stations. (Arctic Biblio.)

Twenty-six genera of podocopid ostracods are now known to be commensal. Of these 26 genera, three are members of the Paradoxostomatidae (McKenzie, 1967). These three genera are Aspidoconcha De Vos, 1953; Laoconella De Vos and Stock, 1956; and Redekea De Vos, 1953. All of the commensal Ostracoda cling to the appendages of other crustaceans to obtain food from currents of water. Since species of *Paradoxostoma* suck the juices of plants (Morkhoven, 1962), this is believed to be the first report on commensalism within the genus. (Author.)


This expedition, sponsored by the Arctic Institute and headed by the author, left Murmansk on Aug. 24, sailed to Dikson Island, then north across the Kara Sea and explored the Arctic Basin north of Franz Joseph Land. The vessel reached 83°21' N, 53°11' E on Sept. 11, the farthest north for a freesailing ship, refuelled twice at Barentsburg, made two trips in area north from Spitsbergen, and on Oct. 28th returned home. Taking advantage of favorable ice conditions, the expedition studied the hydrology, chemistry, biology and geology of the little known area of the Arctic Basin, 80-83° N, 15-65° E'. 57 deep water stations were made, 84 bottom samples, including a 412 cm. core, were taken, 27 trawls were made, including 12 in deep water. A depth of 5449 m. was found at 82°23' N, 19°31' E, the deepest spot so far known. The great number of polar bears (50-60) on edge of the ice pack is noted. Route of expedition is shown on map (p. 124). (Arctic Biblio.)


Includes that part of the North Pacific Ocean north of 45° N and east of 180°, and the adjacent sections of the Bering Sea and Arctic Ocean. Contains Mysidacea from family Lophogastridae through tribe Erythropini. In parts I and II, to the sixteen species of mysids previously reported, sixteen more are added here, seven species and one genus of which are described as new. (Arctic Biblio.)


Includes that part of the North Pacific Ocean north of 45° N and east of 180°, and the adjacent sections of the Bering Sea and the Arctic Ocean. Contains Mysidacea from tribe Mysini through subfamily Mysidellinae. In
parts I and II, to the sixteen species of mysids previously reported, sixteen more are added here, seven species and one genus of which are described as new. (Arctic Biblio.)


Reports of material collected north of Franz Joseph Land and Spitzbergen, half of it from depths of more than 1000 m. Thirty-three species are listed with notes on location and depth of find, morphology, vertical and geographic distribution. Some forms are described in detail. A general and zoogeographic characteristic of the material is included. (Arctic Biblio.)


Contains a key and photographs for the commercially important species of Pandalidae. Discusses life history and research being conducted to improve the fishery.


An investigation of the osmotic concentration of the body liquid of 48 species of invertebrates was carried out on the Murman Biological Station in 1947. It shows that the view of a so-called osmotic balance of pressure of the body liquid with that of the sea water is not valid. Only two species out of 48 were found to be isotonic with sea water; the rest have either higher or lower osmotic concentration of the body liquid; some groups of crustaceans are hypotonic, the rest of the invertebrates are hypertonic. (Arctic Biblio.)


Contains notes on the systematic position of this family of marine polychaete worms together with its diagnosis and systematic characteristics, p. 38-76; a discussion of the genera, with a key, p. 76-116, a discussion of the species with keys and diagnoses of 51 species from various waters (11 genera and 3 species described as new), list of localities and data on total distribution; a bibliography (200 items). Includes species distributed along the northern coast of Europe and Asia, in Greenland Waters and Bering Sea. (Arctic Biblio.)

List, with localities, of one hundred seventy-five species, of which about forty-six occur in the Gulf of Alaska, Aleutian waters, Bering Sea and Chukchi Sea. (Arctic Biblio.)


Contains notes on 37 species collected mostly by Dr. Ferris Neave from the Northwind in 1954 of Banks Island and off Icy Cape, Alaska; 27 are new for the area. Six species collected off Nova Scotia and New Brunswick are included. Extent of Northern American and European distribution is given. (Arctic Biblio.)


A summary of the species of Polychaeta hitherto recorded from the western Canadian Arctic is given. Each of the species enumerated is considered in the light of its known, or unknown, occurrence in each of two regions to the west (northern Alaska and the Chukchee Sea) and two to the east (Hudson Bay and Greenland) respectively. The results show an almost complete balance in the number of occurrences of like species in the regions in both directions, suggesting circumpolar distribution within the area studies. (Author.)


Nine species of Polychaeta collected off the Coast of British Columbia are recorded. Two of these (Micromaldane ornithochaeta and Notomastus lineatus var. balanoglossi) have not been reported previously outside of Europe, one (Asychis biceps) is new to the west coast of North America, and four are new to British Columbia. Six species are recorded from the neighborhood of Herschell Island in the western Canadian Arctic. All are new to the region, though known from further western seas, and, in three cases (Melaenis loveni, Antinoella sarsi, and Nephtys malmgreni) from the western Canadian Arctic further east. (Author.)

Observations of benthic invertebrates taken at depths of 800 feet or more in Raunefjord.


Discusses changes in the benthos of what are considered indicator species for Atlantic waters and Arctic waters. The data indicates an influx of Atlantic species.


Investigations on Coburg Island, Arctic Archipelago, have revealed that the blue mussel, *Mytilus edulis* Linne formerly lived 350 km north of its present limit. The age of the mussels on Coburg Island is >38,000 radiocarbon years (GSC-1425), and the deposit probably relates to the warm interval, with accompanying higher sea-level, which corresponds to the Sangamon Interglacial of continental North America. (Author.)


Contains a critical revision of marine and some fresh-water (in Scandinavia) crustaceans of arctic and boreal regions, with a systematic list of about 250 species, including diagnoses of many new species, brief descriptions of other species, synonymy, critical notes and data on distribution. At least 70 species are native to Greenland and Barents Sea, Svalbard Waters and northern provinces of Scandinavia. (Arctic Biblio.)


This comprehensive work gives a description of the morphology of the amphipods; alphabetic list of the more important works written about this order of crustaceans to 1870; chronological survey of knowledge of the amphipods, from Aristotle to the year 1855; development of a system of classification; descriptions of species, with habitats, distribution and other data. Includes alphabetic listing of species (p. 705-711), and a preface to each volume. (Arctic Biblio.)


List, with comprehensive synonymy and circumpolar distribution, of thirty-three species of marine isopods from the Bering Sea waters of Alaska across the Canadian arctic coast to Davis Strait at the 60° N lat. parallel; based on the collections of this expedition and on other sources. (Arctic Biblio.)
Borg, F. 1933. Die Bryozoen. III. Tiel: Die Marinen Bryozoen (Stenolaemata

Lists these arctic Bryozoens with locations.

Bowman, T.E. and R.B. Manning. 1972. Two Arctic Bathyal Crustaceans, the
Shrimp *Bythocaris cayonesus* New Species, and the Amphipod *Eurythenes gryllus*,

Considers these two crustaceans photographed and trapped in 3800 meters
of water in the Arctic Ocean. A key to the arctic species of the shrimp
*Bythocaris* and a description of *Bythocaris cryonesus* n. sp. is included.
The taxonomy, natural history and biogeography of the amphipod *Eurythenes
gryllus* is discussed.

Brady, H.B. 1878. On the Reticularian and Rodiolarian Rhizopoda (Foraminifera
and Polycystina) of the North Polar Expedition of 1875-76. Annals and Magazine

Contains tabular data on distribution of 53 species of Foraminifera
brought home by Capt. H.W. Fielden, naturalist to the Nares Expedition
of 1875-76, from Baffin Bay and Smith Sound, and of 23 additional species
from the coast of Greenland and northern Norway; descriptions of some
species abstracted from papers of various naturalists and notes on distri-
bution of ten genera of Radiolaria from Baffin Bay, Smith Sound and Robeson
Channel. (Arctic Biblio.)

*Stephanoscyphus simplex* Kirkpatrick. Southern California Academy of Sciences.

Reports wide distribution of this coelenterate species; of 32 bottom
samples from the Arctic Ocean, *Stephanoscyphus simplex* was present in
fifteen. These new records are from collections made from ARLIS I,
ARLIS II, and the icebreaker USNS Burton Island, at depths of 110-
1440 m. This data suggests that *S. simplex* is found at shallower depths
in the Arctic Ocean than elsewhere. (Arctic Biblio.)

Kirkpatrick from the Arctic Ocean. Southern California Academy of Sciences.
Bulletin. 61(1):64.

A single specimen from a depth of 1540 m at 71°45' N, 144°55'W in the
Beaufort Sea, and a colony from a depth of 471 m. at 74°54' N, 165°48' W
in the Chukchi Sea, extend the distribution of this species into the
Arctic, and the range of its temperature tolerance to -0.4°. (Arctic
Biblio.)

Danielsen and Koren from the Beaufort Sea. Southern California Academy of
A complete specimen of this worm was recovered from clayey silt at a depth of 110 m. in the Beaufort Sea in bottom samples taken by the USNS Burton Island, 1960. This is a first regional report of this species in normal substrate; it had previously been washed ashore at Pt. Barrow after a storm. (Arctic Biblio.)


Briefly discussed findings of this amphipod on the Norwegian coast.


New records of *Calocarides coronatus* (Trybom) are given together with notes on the ecology and biology. It is a deep-water thalassinid decapod occurring scattered on very fine silty or clayey bottoms. Eggs are laid in February-March and develop slowly and hatch in November-December. The newly hatched larvae is large, being at least 6.0 mm long. (Author.)


Contains historical notes on the study of sponges, a critical survey of the fauna of the arctic calcareous sponges with lists of the species occurring in the White and Barents Seas, geographic distribution of 42 calcareous sponges in Greenland, White, Kara and other arctic seas, bathymetric distribution of the arctic species. (Arctic Biblio.)


Tabular presentation of sponges collected in 1906 aboard the Andrei Pervozvannyi in Barents and Kara Seas, with location, depth and the type of bottom of each station and the temperature and salinity of the ocean water. (Arctic Biblio.)


Lists arctic members of this group with locations.

Notes on finds in new areas, one in the Okhotsk Sea, for two alcyonarians with records of temperature and salinity. Also description of a new species, Stylaster (Allopora) boreopacificus, n. sp. with discussion of related species, taxonomic position, etc. (Arctic Biblio.)


Contains a list, with descriptions and discussion, of molluscs, some new collected by Lieut. Betcher of the Beechey voyage, 1925-1928, including several from the northwest coast of Alaska near Icy Cape, and at least one from Avacha Bay, Kamchatka. (Arctic Biblio.)


The first specialized study of harpacticoids from the White Sea is presented. A list of 55 spp. is included, with brief notes on their ecology and geographic distributions (3 forms defined only on the genus level). A total of 53 spp. was found by the author. The work provides the first records of 40 spp. for the White Sea and 7 for Arctic Seas of the USSR. Arctic spp. are absent from the littoral, with boreal spp. accounting for 44.5% and arctic-boreal spp. for 33.3% of the total number. Arctic spp. represent 11.8% of the sublittoral, with boreal forms accounting for 14.7% and arctic-boreal for 38.2%. (Biological Abstracts.)


Comprised of the translated table of contents and summaries of the Russian journal Transactions of the Institute of Marine Fisheries and Oceanography. Discusses the distribution of benthos biomass and its main components; factors determining biomass indices for the whole benthos and for its separate components; and the main bottom fauna complexes of the Barents Sea as shown by the bottom-sampler data.

Translation from the Russian journal Transactions of the Institute of Marine Fisheries and Oceanography. This is the second part of this evaluation of the Barents Sea bottom fauna. It contains discussion of indices of density of forms for different complexes, comparison of bottom complexes of the Barents Sea with those of other parts of the Atlantic, zoogeographical conclusions, typological characteristics of the Barents Sea and a summary.


Results of 130 qualitative and 160 quantitative samples taken at 180 stations from 1953-1960. The author presented data on biomass and distinguishes faunal complexes.


Discusses two commercial concentrations of this deep sea prawn in terms of the physical environment and characteristics of these populations.


Monograph in two parts, the first (p. 3-74) dealing with the taxonomic position and morphology of these crustaceans; their phylogeny and evolution; geographic distribution (including arctic waters); methods of their collection. Pt. 2 presents descriptions of these forms in taxonomic order with synonyms, data on morphometry and anatomy, sexual development, geographical distribution. A list of latin names of the forms described is appended. (Arctic Biblio.)


Summaries are given of studies in the following areas: offshore chemistry, chemistry of upwelling, conductometric analyses of salinity and alkalinity, gas chromatographic determination of dissolved gases in sea water, physical chemistry of sea water, benthic fauna of the Chuckchi Sea, benthic fauna off Oregon, benthic ecology, primary production, Yaquina Bay Studies, oceanic nekton and macroplankton, marine microbiology. (NTIS.)
A new species of shrimps from the Barents Sea, *Bythocaris grumanti* sp. n., is described. Some problems of zoogeography of the genus are discussed. When taking under analysis the data on the distribution and biology of the genus, its Atlantic origin is proved by the author. (Author.)
Based largely on collections from the Calanus-Salvelinus expeditions, 54 species of thecate hydroids were identified from the shelf waters of northern Canada between northeastern Newfoundland and the Alaska-Yukon border. Common species included Halemicium muricatum, Calycella syringa, Campanularia integra, C. speciosa, C. volubilis, Gonothyraea loveni, Filellum serpens, Lafoea gracillima, Sertularella polyzonias, S. tricuspidata, Sertularia schmidtii, and S. similis. Halemicium groenlandicum, H. scutum, Cuspidella procumbens, Calycella gracilis, and Sertularia schmidtii are new records for North America; Ptychogena lactea is previously known from this continent only as the medusa. Twenty-two species are reported in northern Canada for the first time, bringing to 71 the number of thecate species recorded from the region. Nearly half of the 71 species recorded are circumpolar in distribution, and over two-thirds transgress both arctic and subarctic zones.

Most samples had a paucity of hydroids, particularly those from the high arctic. Collection records indicate that the most favorable regions for hydroids in northern Canada are the Strait of Belle Isle, eastern Ungava Bay, eastern Hudson Strait, northern and southeastern Hudson Bay, Foxe Channel, and northern Foxe Basin. (Author.)

Sixteen species of athecate hydroids were identified in collections from the shelf waters of northern Canada between the Strait of Belle Isle and the Alaska-Yukon border. This brings the number of athecate species reported from Canada's north coast to 21, and the total number of hydroid species known from the region to 92. One species, Eudendrium caricum Jaderholm 1908 is placed in synonymy with Eudendrium arbusculum Wright 1859. No high-arctic forms were represented, and only eight of the species are panarctic or low-arctic in distribution. Of the remaining species, six occur in boreal as well as subarctic waters, and two have a wide latitudinal range. Five species, Corymorpha groenlandica, Tubularia regalis, Monocoryne gigantea, Rhizogeton nudus, and Hydractinia monocarpa, are recorded in North American waters for the first time. This five, plus Myriothela phrygia, Eudendrium capillare and the hydroid of Euphysa, are new records for northern Canada. (Author.)
The relationships between benthic organisms and the polar marine environment of the continental shelf and slope of the western Beaufort Sea are being defined by statistical analyses of faunal and environmental data. Of particular interest are the ecological effects on benthic community structure of the uniformly low bottom temperatures, the low and unpredictable input of food, and the scouring of the shallower continental shelf by ice. Preliminary results based on data from 20 bottom trawl samples, 70 grab samples, and bottom photographs demonstrate that species are restricted in their distribution with depth zones.


Contains an anatomical and taxonomic treatment of the eight species of sea anemones, collected on the voyage, with a list arranged by station number, giving position, depth, and type of bottom, and a bibliography. (Arctic Biblio.)


Deals with the small collection of these coelenteraterates brought home by the cruiser Ingolf, and northern species from several museum collections. Contains discussion of the literature and geographic distribution; list with descriptions, of six (including three new) species and one larval form, only one of which occurs in European arctic waters; classification, and a section on morphology of the group; bibliography (62 items). (Arctic Biblio.)


Based on small collection made by the cruiser Ingolf and on northern and arctic specimens from several museums, this paper contains (1) literature and summary; (2) contribution to the systematic classification of Zoantharia;
and (3) a list, with synonyms, references, occurrences, and descriptions of twenty-two (including twelve new) species of corals and sea anemones; bibliography (27 items). (Arctic Biblio.)


List, with localities, of four sea anemones and one zoanth, from the waters in the Kanmark Havn region of Dove Bay, East Greenland. (Arctic Biblio.)


Contains a list, with synonymy, references, distribution, and some descriptive notes, of fifty-eight species of sea anemones from circumpolar seas; a station list for those collected by the German Expedition to the Arctic Ocean, 1898, giving positions and depths; and a bibliography (10 items). (Arctic Biblio.)


List, with synonymy, localities, and remarks, of twenty (including one new) species of corals, sea anemones, etc., collected in the waters west of Greenland; also discussion and tables of distributions and zoogeographical relations, and list of stations. Bibliography, p. 54-55. (Arctic Biblio.)


Results of an examination of a small collection in the U.S. National Museum taken by R.A. Bartlett during several years, to which were added some specimens from the Swedish expedition to Kamchatka and the Aleutian Islands, 1920-22. Author gives an annotated list, with localities and some descriptions, of thirteen (including one new) species of coelenterates from waters off western and northern Alaska, Greenland, Labrador, Canadian Arctic Islands, Franz Josef Land, and Kamchatka. (Arctic Biblio.)


Contains account of five species of actinians collected by the MS Stranger in 1937 on the coast of Alaska and north of Bering Sound [sic]. Two of the species seem to be new; one of them, Epiactis polaris, n. sp., develops its embryos in a circular brood chamber, located in the uppermost part of the body, a way hitherto unknown from the Arctic. A bathypelagic species from the Sea of Japan is also included. (Arctic Biblio.)

Similar in plan to the author's Actinaria, part 1, 1921, q.v., this paper includes also forms of sub-tribe Acontiaria, which occur in the same areas. It contains description of forty-four (including eight new) species and one new genus; discussion of distribution of the species; contributions to the anatomy, genealogy, and classification of the Actinaria, a bibliography (256 items) and an index to part 1-2. (Arctic Biblio.)


Systematic classification of known sea anemones by one of the two leading authorities on the subject, with a preface by the other, who discusses their present agreement on the systematics and clarifies their earlier differences. All major groups of sea anemones are believed to be known but the classification is still to be enlarged. In the three orders described, 67 of the species representing 41 genera have arctic locations which range from the intertidal and littoral to depths of 3500 m. Several species are circumpolar. All the main polar areas are represented. (Arctic Biblio.)


Contains abstract of paper presented at the Annual Meeting of the Society of Economic Paleontologists and Mineralogists, New York, Mar. 28-31, 1955. Foraminifera populations in 62 sediment samples are small. Planktonic foraminifera are rare; principle species is Globigerina pachyderma Ehrenberg. The benthonic assemblage in the Chukchi differs from that of the Beaufort. Three zones of benthonic fauna exist: above 65 m, 65-450 m, below 450 m, probably dependent on sea surface temperature which affects ice cover and organic production. (Arctic Biblio.)


Data on the gammarid amphipods and cumaceans from one hundred ninety-nine samples are analyzed using the Simpson index and Shannon-Wiener index. Results indicate high diversity and density on the outer continental shelf and low diversity on the inner shelf and slope.

Discusses and maps on a scale of 1:4,000,000 and 1:10,000,000 the geographic Distribution of this reef clam, also bottom temperatures and bottom sediments in the western North Atlantic postulated as suitable for its survival and/or reproduction. *Spisula polynyma* occurs in the continental shelf regions of Bering and Chukchi Seas, Aleutian waters and the Gulf of Alaska; also in the Gulf of St. Lawrence and southward to Georges Bank. Examined specimens (110 from the Pacific waters noted) and located and identified; including pertinent data. Partial analyses of the distribution of its Pacific locality records indicates temperatures 5.3° - 1.3° C and medium grade sediments suitable for survival and reproduction. This species is reportedly palatable, commonly dug for food in southern Alaska (pink neck clam), but is not of commercial importance. (Arctic Biblio.)


List, with some descriptions, locations and distribution noted, of forty-nine (including nine new) species of marine worms from the coastal waters of Alaska and Northwest Territories, and a few from Hudson Bay. Addendum and emendations on one of these species appear in Ashworth, J.H. Polychaeta (supplementary), 1924, q.v. (Arctic Biblio.)


Discusses reproductive patterns in arctic invertebrates and the implications of pollution disrupting an arctic community.


The number of eggs and density of population /l of water were determined in 110 different samples collected in the area of the White Sea Biological Station. The samples included 33 spp. of Harpacticoida. It is shown that fertility was directly related to population; thus, 14 spp. averaged less than 1 specimen /l, and the average number of eggs collected for these spp. was only 15. Thirteen species, of which there were 1-20 specimens /l, averaged 27 eggs, and 8 spp. with a frequency of more than 20 specimens /l averaged 47 eggs. (Biological Abstracts.)


Published records on the occurrence and distribution of six brachyuran species in Scandinavian waters are corrected. (Author.)

Begun as a memoir on the Crinoidea collected in 1906 in the Bering Sea this is an extensive monograph on existing comatulids consisting of 5 parts.


List, with locations and discussion of distribution, of twenty species from waters between Bering Strait and Bathurst Inlet, with additional list of fifteen species from Hudson Bay area; based on specimens from Eastern Arctic expeditions. (Arctic Biblio.)


See Clark, A.H., 1915.


See Clark, A.H., 1915.


Lists echinoderms (exclusive of holothurians) collected in the area about Baffin Island and Greenland with locations.


See Clark, A.H., 1915.


See Clark, A.H., 1915.


See Clark, A.H., 1915.

A report of molluscs collected in 1959-1960 from station Charlie in the North Canadian Basin about 800 miles north of the Bering Strait. Species found are listed with locality and depth. A systematic discussion with plates is included.


See Clark, A.H., 1915.


Record of 17 species taken during summer 1958 while drifting northeasterly some 800 miles north of Point Barrow and 300 miles from the North Pole. Three of the species: Colus hunkinsi, Nucula zophos and Malletia abyssopolaris are new, and described in detail. Some of the material was probably transported from shallow waters. (Arctic Biblio.)


Reports the 1959 and 1960 collections, 2068 specimens, dredged near the western flank of the Chukchi Rise about 800 mi. north of Bering Strait. Included are one scaphopod, 12 gastropod, and 11 pelecypod species, one gastropod, Alvania karlini n. sp., described as new; other finds represent substantial bathymetric and geographic range extensions. Some samples also eight species described by Gorbunov are illus. (Arctic Biblio.)


Presents some conclusions from analysis of information on this fauna at 1000 fm. and deeper: its differences from typical shallow-water mollusc fauna in composition and feeding, the latter most striking in bivalves. The abyssal and shallow-water bivalve faunas at Point Barrow, Alaska, have greater similarity than do those of New England or Puerto Rico. Off East Greenland, filter-feeding bivalves have declines to secondary importance in the 100-200 m interval. Data from Kuril-Kamchatka Trench at 6000-9000 m indicate that in favorable localities deep-sea plankton may constitute a more important food source for filter-feeding mollusks than previously realized. (Arctic Biblio.)

Benthic biological samplers of a new design have been used successfully on ice-rafted archibenthal and abyssal sediments of boulders and mud. The dredge is kite-shaped, of massive construction, and features a single point for cable attachment and a removable cannister for specimen retrieval. Experience in Baffin Bay, the Labrador Sea, and the Icelandic Shelf indicates that the Arctic dredge is a reliable tool for arctic and subarctic research. (Author.)


Briefly discusses distribution and taxonomy of this genus.


A preliminary analysis of data from tagging experiments with the south-eastern Bering Sea King crab. The data gives information on growth rates and mortality rates.


A taxonomic review of the Tellinacea occurring from the Arctic coast of Alaska to the central coast of Baja California. Includes discussions on nomenclature, historical taxonomy, biogeography, and ecology. Species descriptions are accompanied by black and white plates.


Contains general characters of nemerteans, anatomical and histological structures, development, geographical distribution, systematic position. Distribution of the Pacific coast species, keys to groups and species, and a systematic account of 86 species (in 20 genera) are given; 24 of the species are new; 33 recorded on the Alaskan coast, nine in Aleutian waters, nine in the Bering Sea and one in Arctic Ocean. (Arctic Biblio.)


Four species not previously found off the northwest coast of Greenland are presented with known distribution and some notes on taxonomy. A list of nemerteans reported from the arctic is given with species' distributions.
**Coe, W.R. 1952. Geographical Distribution of the Species of Nemertaeans of the
557.

Contains an account of the worldwide distribution of the 24 species belonging
to nine genera of nemertean worms which occur from shallow water to depths
of 250 meters on the north Alaskan coast near Point Barrow. (Arctic Biblio.)

Baseline Data Study of the Alaskan Arctic Aquatic Environment. 217-219 p.
No. 16100 EOM and Grant No. 36109. Institute of Marine Science. Rep. No. R72-3,
University of Alaska, Fairbanks.


Reports several new localities where species of the molluscan genus Mya
have been observed in Alaska, on both coasts of the Alaska peninsula
from Pavlov Bay to Wide Bay. Notes on the general distribution of Mya
in the Arctic are included. The genus is considered an unexploited eco-
nomic resource. (Arctic Biblio.)


Lists and gives abundance estimates of molluscs collected in the Port
Moller - Herendeen Bay area in 1965.

Cowan, I. Mct. 1968. The Interrelationships of Certain Boreal and Arctic

The author compares a series of measurements on Arctic and Boreal species
of Yoldia and discusses their taxonomic significance. A resume of the
species discussed, including their synonymy, is included in the taxonomic
discussion. Contains photographs.


p. 411-466.

Cromie, W.J. 1960. Preliminary Results of Investigations on Arctic Drift Sta-
Report No. 3. 33 p.
The station drifted east-west across a shallow peninsula of the Chukchi Shelf (approx. 77°35' N, 160°-165° W) during July-Aug. 1959. Continuous soundings were taken within an accuracy of one meter across the feature and is adjacent deep water. A bathymetric profile has been constructed and the angles of slope computed from seismic reflections. Piston cores (22) were taken, ranging in penetration to 250 cm. Over a hundred bottom photographs show rocks and abundance of life. Geological and biological specimens were sampled by trawl. An attempt at dating by radiocarbon analysis of pelagic forms is in progress. Work was done in seismology (dip and strike of bottom sediments, long-range sound transmission); one earthquake was recorded. Relative and continuous absolute values of the magnetic field were measured. Small variations in atmospheric pressure were recorded continuously on a micro-variobarograph. (Arctic Biblio.)


List, with synonyms, records of occurrence, and southern limits of range of one hundred sixteen species of mulluscs and two brachiopods, from Chukchi Sea to Okhotsk Sea, the Aleutian waters and Gulf of Alaska (Arctic Biblio.)


Some species of Scoloplos, including S. acutus, have been described as differing from Scoloplos armiger by the absence of distinctive hooks (crochetts) in the thoracic neuropodia and by the absence of subpodial papillae in the region adjacent to the junction of thoracic and abdominal setigers. Although these species have previously been synonymized with S. armiger, little objective evidence has been put forth to support the synonyms and the species persist in the literature. Data presented here demonstrate that the presence of hooks and subpodial papillae is related to growth and so their absence cannot be considered a good criterion for the discrimination of separate species. (Author.) Specimens were collected at Tanquary Fiord, Ellesmere Island (81°N, 80°W).


Presents data on 69 polychaete species collected in more than 350 bottom samples. Gradient analysis is carried out on the data and discussed.

The benthic fauna of Hare and Tanquary fiords was collected in replicate grab samples taken at standardized depths from 6 to 100 m. From this collection, 68 polychaete species were identified. Two of these, *Hartmania moorei* Pettibone and *Zeppelinia monostyla* (Zeppelin), have not previously been reported in the Arctic. Population densities of common species were similar in each fiord. Distributions at less than 10 m in Tanquary Fiord appear to be greatly modified by the presence of fiord water, a brackish surface layer formed during the summer ice melt. Among the polychaetes, depth ranges and depths of greatest abundance usually differed and so the species appeared to be scattered along the depth gradient rather than grouped in distinct assemblages. (Author.)


List, with locations and notes on synonymy and distribution, of twenty-six species from the waters between Bering Sea and Bernard Harbour, N.W.T. (Arctic Biblio.)


Taxonomic list (with data on known arctic distribution, descriptions and synonymy) of one hundred eighty-two species, based on collections made by R.A. Bartlett, 1925-33 in the Greenland and Canadian Arctic Seas, and Hudson Bay, also on earlier records of forms from the arctic regions. (Arctic Biblio.)

Catalog based on previous explorers, on the author's, and on whalers' collections, ranging from the North Alaskan coast to the Aleutians, and including the Siberian side of Bering Sea. Includes three tunicates, two brachiopods, and one hundred and sixteen molluscs. (Arctic Biblio.)


Discussion of the comparative morphology and nomenclature of the chitons, and a systematic list, with descriptions, synonymy, habitats and distribution, of twenty-nine species of chitons and nineteen (including one new) species of limpets, ranging from Pt. Barrow waters to southeastern Alaskan waters and Okhotsk Sea. Includes circumpolar distribution and species outside Alaskan waters. (Arctic Biblio.)


List of fourteen species with notes on specimens, and descriptions of three new species. (Arctic Biblio.)


Systematic annotated list, with localities, of sixty-one species of molluscs and one brachiopod, obtained from beach and dredging near Point Barrow, Franklin Point, and Norton Sound, with three snails from tundra moss near Point Barrow. (Arctic Biblio.)


With Dall, 1902, contains a critical revision of 11 American land shells and about 150 marine species from the Atlantic and Pacific coasts. Two genera, one section and 39 species are described as new. At least 40 of the species, including some new ones, are native to the Chukchi and Bering Seas, Aleutian Island Waters, Baffin Bay-Davis Strait and Labrador Sea. (Arctic Biblio.)

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Contains a discussion of this molluscan family and its subdivisions, brief descriptions of 32 species, and full descriptions of six newly-named forms. At least five of the new species and 15 described earlier are listed as native to arctic seas, Greenland waters, Canadian Arctic Islands waters, Bering Sea, Bering Strait, and Chukchi Sea (Arctic Biblio.)


List of one hundred (mainly marine) species, including seven new species fully described, arranged by collecting stations in waters between Teller, Alaska and Bathurst Inlet; appended is a list of thirty Pleistocene fossil species from the coast of Yukon and Northwest Territories. (Arctic Biblio.)


A listing by station of mollusca found in arctic waters of the United States with some general notes and species descriptions.


Contains a systematic list of 2122 species of the marine bivalve mollusks excluding the Cephalopoda and Nudibranchiata. Among them are 148 arctic species and 291 of the Aleutian subfauna (p. 4). The names of a few new species are included without descriptions but with references to the proposed vehicle of publication. (Arctic Biblio.)

An addendum to the species found and reported for the Canadian Arctic.


Contains an alphabetical list and illustrations of nearly two hundred shells from the northern waters of the Pacific Ocean; seventeen of them are described as new. More than a hundred shells are from the Sea of Okhotsk, Bering Sea, Aleutian Waters, Gulf of Alaska, and a few from the Arctic Ocean north of Bering Strait. An index of genera is supplied. (Arctic Biblio.)


Briefly discusses sampling technique and objectives of samples taken in Labrador Sea and Davis Strait.


A systematic discussion of sponges collected near Pt. Barrow with some general remarks on distribution of sponges.


List, with descriptions and locations noted, of six species of sponges from waters between Bering Strait and Hudson Bay. (Arctic Biblio.)


Contains data on the zoological, oceanographic and hydrological investigations of Novaya Zemlya, carried out by the expeditions of the Northern Scientific-Industrial Institute and Hydrological Institute in 1923-24, with notes on the most interesting finds in the zoological field. (Arctic Biblio.)

A comprehensive biological and hydrographic study based largely on exploration conducted during 1922-1926 by the State Hydrological Institute and the Institute for Exploration of the North with the Murman. Deriugin himself carried out the work with his colleagues and students. These investigations are outlined year by year (p. 10-34) with an introductory account (p. 1-9) of the topography and history of the White Sea. Results of the hydrological and biological investigations of 1922 and 1923 are presented (p. 35-89): temperature, chlorinity, salinity, etc., with depth; benthonic forms collected at stations, and depth and bottom character of them. Chap. 5. (p. 90-181) covers the hydrography of the White Sea: thermic conditions and salinity, oxygen and CO$_2$, pH, transparency, ice, currents. The bottom deposits are outlined (p. 182-97). An extensive treatment of the fauna (p. 198-352) reviews past faunistic research and continues with descriptions of the forms collected (in taxonomic order, from protozoans to mammals), including notes on occurrence, geographic distribution, taxonomic position, etc. The general characteristic of this fauna and its negative traits are outlined. Phyto- and zooplankton collected, its character, origin, etc. (p. 363-78), and the seaweeds (p. 379-82), are dealt with briefly. Zonation and ecological aspects, from the littoral down to the "pseudoabyssal" are discussed (p. 383-426). Quantitative aspects of the benthos are presented and zonation of the area is dealt with (p. 427-40) on the basis of the benthonic population. Finally the geographic origins of the studied fauna are considered, and an alphabetic list appended of the names of species and genera described, some 1,500 forms. (Arctic Biblio.)


After reference is made to the relation between hydrography, especially temperature, and life in the sea, the author points to the recent warming of the Barents Sea and the biological changes thus brought about. The latter include penetration of northern Norwegian planktonic and benthonic forms into the Kola Fjord and the central Murman. Cod moved as far east as Novaya Zemlya with a corresponding benefit to fisheries. (Arctic Biblio.)


Report on the benthos collected by P.K. Khmyzhnikov at 12 stations whilst on an upstream journey in 1925. The material contained typical estuarine forms with some local elements. Temperature and salinity are also noted. (Arctic Biblio.)

Description of 19 species of molluscs and two echinoderms, the latter so scarce because of the brackish condition of the area. A new species of mollusc Bela amundseni n. sp. is described in detail. As to the other forms, location of finds, nature of bottom, water temperature, geographic distribution, etc., are noted. The material was collected by P.K. Khmyzhnikov and A. Popov in 1926 and 1927. (Arctic Biblio.)


A report on investigations of three groups of this expedition, one of which under G.E. Ratmanov on the Krasnoarmeets, covered the Bering and Chukchi Seas (p. 17-24). Interesting results were obtained from the study of the "cold spot" in Anadyr Bay, and the effects of the hydrological conditions upon the plankton, benthos and the distribution of fishes were elucidated. Currents in the Bering Strait, ice conditions, and some hydrological as well as biological problems were also studies (Arctic Biblio.)


Contains a bio-geographical and hydrological characterization of the various seas of the USSR, including the White, Barents, Kara, Okhotsk and Bering Seas. Their origin, geological age, biological and ecological features of their faunas, and the latter's probable course of evolution are discussed in light of the recent studies of Soviet scientists, to which the author contributed by his expeditions of 1931-1935 and 1937. (Arctic Biblio.)


An account based on the work of several expeditions active since 1929. A series of areas both in the shallow and deep sea are outlined and their more common forms listed. The distribution and occurrence of the latter are viewed as determined by the nature of the bottom, temperature, depth, etc. (Arctic Biblio.)

Contains in the introductory part (p. 1-105), data on the type of echinoderms and a table for the determination of the classes; external morphology of echinoids; glossary of terms; a synopsis and a table for determination of families and subfamilies of echinoidea; historical notes; and a bibliography. In the special part (p. 106-301) are keys to the families, genera and species, and an enumeration of 12 species of sea urchins, with synonyms, Latin diagnoses, descriptions, comparative notes, also data on their ecology and geographic distribution. A few species native to Greenland, Barents, Kara and Bering Seas are included. (Arctic Biblio.)


Contains a description of a new species of starfish, Amphipholis murmanica, sp. n., together with brief notes on the occurrence of a few other species of this family. Summary in Russian. (Arctic Biblio.)


Based on a study of the starfishes in the Leningrad Academy of Sciences, Zoological Museum collected in waters from Bering Sea westward to West Spitsbergen; a comparison of the Starishes, L. mulleri, L. hyperborea, and L. groenlandica, and full description of Leptasterias sibirica, sp. nov., from Chukchi Sea; bibliography (25 items). (Arctic Biblio.)


Contains descriptions of three new starfish, including Leptasterias nanimensis beringiana subsp. n., found in 1882 in Bering Island waters. (Arctic Biblio.)

Contains general characteristics of Echinodermata and tables for the determination of classes, orders, families, genera and species of echinoderms of all arctic seas along the northern coast of European and Asiatic USSR, with descriptions of the species and data on distribution; bibliography (40 items); index of Latin names. (Arctic Biblio.)


Contains a monographic treatment of the genus Leptasterias of Northwestern Pacific, including Okhotsk Sea, Bering Sea, Bering Strait and adjoining parts of Arctic Ocean (Chukchi Sea); with a key to the species and subspecies, a monographic description of 24 species (10 new), with synonymy, list of stations, critical notes, biological and ecological data and distribution. A small part of this work (introduction and keys, p. 749-60) is in Russian, the rest in German. (Arctic Biblio.)


Contains an ecological study of some marine starfishes, including Strongylocentrotus droebachiensis, a circumpolar species of the Northern Hemisphere, Paraniomorpha tumida also having wide distribution in arctic waters (all Russian northern seas and Greenland waters), and Tropheodiscus, Leptasterias and Asterias species (Bering and Okhotsk Seas). Data are given on ecological factors influencing the extent and character of individual and age variability and its importance in the evolutionary process. Summary in English. (Arctic Biblio.)


Contains report based on a 1932 deep-sea investigation of the Okhotsk Sea carried out by the government Hydrological Institute and the Pacific Institute of Fisheries and Oceanography. Twelve species are described with details in morphology and anatomy; location, depth and date of find; comparative notes, etc. A list of additional 13 species found below 500 m is attached. (Arctic Biblio.)

Contains section II, Pedicellaster M. Sars (4 species); III, Erasterias Verrill (3 species); IV, Asterias (L.) Fisher (6 species). Data for each species (or form) include: synonyms, morphology and morphometry, comparative morphology, occurrence and geographical distribution. Genetic characteristics and data are given at the beginning of each chapter. Species of these genera inhabit arctic seas. Bibliographic footnotes. (Arctic Biblio.)


Contains (in the general part, p. 1-16) brief characteristics of Echinodermata, history of the study, phylogenetic relationship of classes, a morphological sketch of the starfishes (Asteroidea), their ecology and geographic distribution in the arctic seas, Okhotsk, Bering and Japanese Seas. In the systematic part are: keys for the determination of orders, families, genera and species and brief diagnoses of about 150 species and 50 lower forms of starfishes (in 46 genera and 15 families) native to USSR waters, with synonymy and data on Russian and total distribution; index of Latin names, p. 199-202. (Arctic Biblio.)


Contains a systematic index of the species, followed (p. 9-18) by an introductory part with general characteristics of the brittle stars, their morphology, life habit, and geographic distribution. In the systematic part (p. 19-132) are tables for the determination of the orders (Euryalae and Ophiurae), families, genera and species; a systematic list of 114 species and subspecies, with diagnosis of 15 new species and two new forms, synonyms, and data of Russian and total distribution. An index of Latin names is appended. Many species native to Arctic Seas, Bering Sea and Sea of Okhotsk are included. This paper is a continuation of the study of Echinodermata of the Russian Seas published in 1950. (Arctic Biblio.)

Contains observations on the ability of certain representatives of Echinodermata, such as Ophiocten sericeum, Solaster papposus and Stegophiura nodosa of the Chukchi Sea, and Echinarchnus parma of Kamchatka waters, to withstand fluctuation of salinity. The younger animals especially prefer the upper layers of the sea water where the salinity is less than on lower levels. (Arctic Biblio.)

Lists arctic members of this group with locations.

Lists arctic members of this echinoderm group with locations.

Lists arctic decapods with locations.

Brief discussion of the taxonomy and systematics of these genera with a description of Metahuntemennia smirnovi sp. n. In German.

The Arctic and sub-Arctic are defined in terms of marine environment. Differences in biological productivity between the areas are discussed, with consideration of the chemical and physical factors involved. Plankton production and biology, bentonic and littoral fauna, and fishes and marine animals present problems related to North America's fisheries and Eskimo needs. In each case problems are listed for future study, a discussion of systematic and zoogeographic problems closing the report. Maps show (1) zones of marine environment, (2) bathymetry, and (3) major currents of northern seas. Diagram illustrates the biological cycle in arctic and sub-arctic marine zones. (Arctic Biblio.)

Considers the evolution of stability through natural selection in high latitude ecosystems, i.e., complexes of interacting and interdependent organisms and physical factors of the environment. In contrast to the stable (ideal)
systems of tropical areas, those in polar and temperate regions are oscillating, a symptom of non-adaptation attributed to the shorter period during which they have evolved. The high latitude systems are evolving toward greater stability however, and some examples are given among marine fauna and sea birds in cold climates. Selective mechanisms tend toward survival of the system rather than the individual or species. (Arctic Biblio.)


Based on the collections of the British Arctic Expedition, 1875-1876, mostly between 79°20'N, and 82°27'N, and a few specimens from the Valorous cruise in 1875 between 66°56' and 70°30'N. A list with synonymy descriptions, and distribution of thirty species of sea cucumbers, urchins, stars, etc., from Baffin Bay and Smith Sound-Robeson Channel waters. (Arctic Biblio.)

Abstract of the paper only. Indicates faunal changes with water depth and distance from shore.


A study of shore animals made in the summer 1953, covering Frobisher Bay, Cumberland Sound and Padloping Island. Thirty species of invertebrates and four of fishes are recorded from the area; their habitat and distribution are described and compared with those in Greenland. A detailed itinerary and review of earlier work precede the account. (Arctic Biblio.)


Preliminary discussion of the results of quantitative surveys of the benthos of soft sea-bottoms in Greenland and N.W.T. The author relates the distribution of communities to environmental conditions.


Study of the fauna living in or on soft bottoms, made in northern Baffin Island during 1954-1955, in Greenland 1956 and in Foxe Basin 1957. Both quantitative and qualitative determinations were conducted, with depth-range with geographic distribution of the collected forms considered. Factors affecting the composition and the standing crops, as well as productivity are analyzed and discussed. An annotated list of species collected is appended together with tables of collecting grounds, and quantitative data for the fauna studied. Despite variable distribution of species, lamellibranchs, foraminifera, polychaetes, echinoderms, etc., the surveys showed the bottom communities present and enabled rough estimates of standing crops within the communities. (Arctic Biblio.)


Discusses zonation of the intertidal zone in the Canadian Arctic and subarctic. Different shore types are discussed with regard to fauna and flora and the physical parameters affecting them.

*Grania pusilla* is described from the west coasts of Norway and Sweden. It differs from other *Grania* species particularly in length, in the morphology of the spermathacae, and in the size of the penial bulb. The taxonomy of the genus *Grania* Southern, 1913 is discussed. (Biological Abstracts.)

A general discussion of the ice-stressed ecosystem including shoreline processes, circulation patterns, productivity, stress factors and their influence on the fauna with further discussion on two ice-stressed systems (Elson Lagoon and Esatkuat Lagoon).


Two cores of Arctic Ocean sediments were studied to determine their faunal content. Emphasis was placed on the benthonic Foraminifera and their usefulness in paleoecologic considerations. Relative abundances were determined and species were identified. (NTIS.)


The paper is a revision of the Norwegian nephtyids. The following species have been found in Norwegian waters: *Nephtys hombergi*, *N. ciliata*, *N. longosetosa*, *N. caeca*, *N. paradoxa*, *N. incisa*, *Aglaophamus malmgreni* and *A. rubella*. The ecological data existing for the present material are discussed and some comments are given on the geographical and bathymetrical distribution of the species. (Author.)


Description of forms collected by the research vessel VITIAZ' 1949-1954, from the Okhotsk and Bering Seas, including two new species, *Astarte (Astarte) multicosata* and *A. (A.) derjugini*. Morphometry, location, color of valves, etc., are noted. (Arctic Biblio.)

Account of the composition and geographic distribution of this fauna, based on materials of Zoological Institute of the Academy of Sciences and the author's collections during 1934-38 and 1945. The coastal seas, west to east, and the abyssal molluscs of the Arctic Ocean proper are treated in turn; 145 species and 45 subspecies are recorded and their quantitative and qualitative distribution analyzed. For each area, the physical and ecological conditions are outlined, the molluscan fauna and characteristics are presented, and general descriptions given in conclusion. (Arctic Biblio.)


Attempt based on qualitative and, where data available, quantitative distribution of bivalves. Author distinguished two regions (oblast'), boreal and arctic, the latter further divided into low-arctic and high-arctic sub-regions. Further zonation is based on a depth distribution of these molluscs (e.g. littoral, abyssal) and on geographic provinces, as Polar-Greenland province, etc. (Arctic Biblio.)

Filatova, Z.A. 1959. General Review of the Bivalve Mollusks of the Northern Seas of the USSR. American Institute of Biological Sciences. 44 p. (Translation from Akademiia Nauk SSSR. Institut Okeanologii, Trudy. 20.)


The data on the composition and distribution of the bottom fauna in the western Bering Sea were received in 1950-1952. During that period 256 stations were occupied. One hundred seventy-three quantitative samples of the bottom fauna were taken with large bottom-samples "Ocean-50" and Petersen grab and 64 samples were gathered with Sigsbye trawl. Forty-six of the stations were occupied at the depths exceeding 1000 m and 39 of them at depths exceeding 2000 m. Eighteen communities of the bottom fauna were established in western Bering Sea. True oceanic deep-sea species are dominant in the abyssal bottom-fauna communities of the western Bering Sea. Some species living presumably on the slope of the shelf are the leading forms of bathyal communities. A great many arctic-circumpolar, arctic-boreal, and north-boreal Pacific species of the bottom fauna are part of the composition of the shallow-water communities of the western Bering Sea. (Author.) (NTIS.)

Reports a study of quantitative distribution based on 173 bottom-grab and 64 trawl samples collected at 8-4820 m depth in the western part of the sea, and 280 samples at 20-540 m in the eastern part. Sublittoral and abyssal biocoenoseses are reported and mapped. Spatial distribution is described. (Arctic Biblio.)


Account of quantitative and also qualitative distribution of the main bottom forms of this area are given with information on its relief and sediments; distribution of the total biomass and the biomass of bivalves, polychaetes, echinoderms, etc. main biocoenoses; qualitative and quantitative composition of these biocoenoses; some characteristic traits of the bottom fauna of the Kara Sea. (Arctic Biblio.)


Lists arctic members of these groups with locations.


List with locations and distribution noted, of twenty-five species from the east coastal waters of Hudson Bay, and westward to the Alaskan coast of Bering Sea. (Arctic Biblio.)


Describes Harpacticus compressus n. sp., collected with H. uniremis from green algae in shallow water at low tide on the southwest tip of Nexman Peninsula in Chiniak Bay. The new species is placed with four other species in a group of Harpacticus characterized by one or two inner setae on the second endopodal segment of the female leg two. (Arctic Biblio.)
In 1957-59 a survey was made of the benthos in the region from Motovskii Gulf and the Kola meridian to the shores of Novaya Zemlya and the Karskie Vorota (strait) and to 72°30' N latitude in the north. In these catches 55 bivalve species were found. For the last 30 years boundaries for the ranges of a number of species have shifted to the east. The author analyzes the possible effect of changes in temperature and salinity on conditions for the breeding of species of western and eastern origin.


Gal'tzova, V.V. A Quantitative Characteristics of Meiobenthos in the Chupinsky Inlet of the White Sea. Zoologicheskii Zhurnal 50:641-647.


The report presents the preliminary results and tabulated station data on the deep-sea benthic samples and photographs taken during the period between September 1969 and February 1970 from the Fletcher's Ice Island T-3. Descriptions of the new collecting equipment used are also provided with illustrations. Observations of unusual interest and recommendations for future studies on research initiated during this period are also included. T-3 as an ideal oceanographic platform for deep-sea benthic studies is pointed out. The report also contains the preliminary results of physiological studies on thermal tolerance; endurance to super-cooling; salinity tolerance and deep-submergence experiments for observing pressure effects. This document emphasized the added effort to USC project during this period on benthic studies and physiological investigations on Arctic marine biota. (Author.)


Lists, with detailed morphologic and taxonomic information, several species of these crustaceans collected 1948-1950 by various parties. The latter, working in the area described, with pertinent station data and species recovered. Some taxonomically significant variations are noted among the species listed, also some range extensions. (Arctic Biblio.)

Outlines earlier work on this largely arcto-boreal group, and discusses its morpho-physiology, variability, phylogeny, geographic distribution, and ecology. A species part p. 97-183, deals with 25 species, incl. keys, synonymy, morphology with differential diagnoses, geographic and depth distribution, reproduction, etc. Appended are 28 plates with excellent photos. (Arctic Biblio.)


Records 59 species collected during warm seasons of 1955-57. Location and number of finds, size, geographic and depth distribution are noted. General ecological and zoogeographic aspects of these molluscs are also discussed. (Arctic Biblio.)


Describes two egg capsules of snails collected in 1963, and compares shell dimensions of three juveniles from one of the capsules with those of sub-adult and adult animals. The large capsules and few, large, nonpelagic young that develop in them are interpreted as an adaption for reproduction in cold seas. (Arctic Biblio.)


Lists species described by each of the earlier investigators and some 149 forms identified by the author from various collections of the present century. All the material is tabulated in taxonomic order with notes on earlier records and depth of finds. Over 80% of the forms are arctic. (Arctic Biblio.)


Gives distributional data for 26 species recorded in the literature, with indication of water depths and substrate. The localities extend from Cape Lisburne-Pt. Barrow in the Chukchi Sea, eastward through Canadian Arctic Islands waters, from northeasternmost Ellesmere to southern Labrador Sea and Hudson and James Bays. (Arctic Biblio.)


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Twenty-four species of sea stars are reported from northern North American waters between the Strait of Belle Isle and Point Barrow, Alaska. A key for identification and morphological descriptions of all the recorded species and several of probable occurrences in the region are included. Data are given on geographical distribution and on depth, substrate, temperature, and salinity conditions. Arctic-subarctic waters surrounding the Arctic Ocean are shown on the basis of sea star distribution to comprise two major zoogeographical regions: Atlantic-arctic and Pacific. Arctic North America east of about 120° W is included in the Atlantic-arctic region. Farther west the fauna is primarily Pacific. (Author.)


Contains a classified list, with some descriptions, of twenty-three species of marine molluscs (presumably), from Baffin Bay and Canadian Arctic Islands waters. (Arctic Biblio.)


Contains (1) introductory remarks; and (2) list, with description of fleshy parts and shells, of molluscs, (some new) collected on the Beechey voyage of 1825-28, and on other expeditions of about the same period. Includes several specimens from Icy Cape, Alaska, and from other unspecified portions of the Arctic and Pacific Oceans. (Arctic Biblio.)

Presents result of investigation of foraminifera in cores of the bottom sediments collected by Charles Horvath 1952-1955 on ice island T-3. Samples were taken from a rectangular area 82°32' - 86°45'N and 81°20' - 85°40'W at 433 to 2760 m depth and at 24 surface locations. Previous foraminiferal studies are noted. Comparison is made with sediments, bottom topography, water depth, calcium carbonate distribution, organic carbon content of sediments, water temperature and salinity, and associated organisms. Twenty species were useful in establishing depth zones. Five species and one variety are new. Faunal changes correspond generally at one station. Systematic description is given; also an annotated list of 105 species collected. (Arctic Biblio.)


In an arctic intertidal environment on Hudson Bay, Macoma balthica have a higher growth rate at the tidal level of 1.1 m above mean low water than at the mean low water level, in terms of both length and dry weight. Temperature, rather than food, appears to be the primary proximate factor involved, and summer air temperatures play a major role. The estimated growth rates are comparable to reported growth rates for intertidal Macoma populations in Scotland and the Netherlands. A partial life table calculated from the death assemblage indicates that Macoma at 1.1 m above mean low water have an annual mortality which increases from about 20% at age 2 to about 50% at age 7 years. (Author.)


The paper deals with the genera Spirontocaris, Lebbeus, Eualus and Thoralus, with eight species, their systematic position and their occurrence along the Norwegian coast. S. lilljeborgii, L. polaris, and E. pusiolus are common in the whole area. T. cranchii and E. occultus are frequently found in southern Norway. E. occultus is recorded for the first time from Norway. S. spinus, S. phippsi, and E. gaimardii are common in north Norway, having their southern limit in western Norway. A key to the Norwegian species is given, with a short note on the two parasitic isopods found. (Author.)


A population of the Iceland scallop (Chlamys islandica) from western Norway is described. Information on the topography and hydrography of the locality and description of the habitat is given. Eighty-eight scallops were measured and the results are given. This is the southern-most known population of the Iceland scallop in Europe, but isolated specimens are reported further south. (Author.)

Lists and describes arctic ophiuroids with locations.


Contains a study of the bioceonose of Laminaria overgrowth in Kola Bay, including some notes on L. stenophylla, L. saccharina and L. digitata and sixteen other algae, also data on faunal population of the stays and rhizoids of these Laminaria and a list of one hundred seventy-one species of various marine animals: the Crustacea determined by the author; Mollusca by K.M. Deriugin; Spongia by P.D. Rezvyi; Polychaeta by I.G. Zaks; Nemertini by P.V. Ushakov; Bryozoa by G.A. Kluge; Nematoda by I.N. Filip'ev; Algae by E.S. Zinova; periodical changes and ontogeny of the biocoenose are discussed. Summary in English. (Arctic Biblio.)


Contains results of the study of marine fauna of four "dvory" (small inlets) of Kola Bay, investigated in the summers of 1921-23 by a group of students (including the author) under direction of Prof. K.M. Deriugin; includes data on littoral and sublittoral distribution of marine fauna and a systematic list of one hundred seventy-six marine animals, determined by K.M. Deriugin, the author and some other specialists. Summary in German. (Arctic Biblio.)


Contains an analysis of littoral life of Kola Bay and comparisons with conditions at several points on the Barents and White Seas. Three kinds of littoral are distinguished: a high arctic (polar), an arctic and sub-arctic. Their main characteristics and components are discussed and their part in making up the life of the compared areas reviewed. (Arctic Biblio.)


Contains critical notes on certain marine fauna (mainly Mollusca and Crustacea) collected 1921-26, and determined as new to the European arctic waters in which they were found. Includes thirteen molluscs, eleven crus-
taceans and nine worms, new to the fauna of Kola Bay; five molluscs and five crustaceans, Barents Sea; two molluscs and two crustaceans, White Sea; and five mollusks and five other marine fauna from Kara Sea and Novaya Zemlya waters; bibliography (26 items). Summary in English. (Arctic Biblio.)


Contains general notes on the hydrological regime of this arm of Barents Sea, and data on its elements, origin and peculiar features of its fauna. Notes on some typical species and a table of zonal distribution of benthos organisms are included. (Arctic Biblio.)


Results of a study of these crustaceans collected in 1921-24, by the Northern Scientific and Economic Expedition, 1920-1926, listing twenty-eight species, with data on their locations, and distribution. Summary in English. (Arctic Biblio.)


Contains a list of thirty-seven species of crustaceans (Isopoda and Amphipoda) of the Barents, White and Kara Seas, and an enumeration, with critical notes and data on distribution in arctic regions. Summary in English. (Arctic Biblio.)


A study based on observations of the Cheshskaya Bay Expedition, 1925-26, describing the benthos fauna of the region, its relation to conditions peculiar to the bay and distribution in other seas. Bibliography, p. 96-98. Summary in English. (Arctic Biblio.)


Contains descriptions of one new species and one new variety of isopods and six new species of amphipods from Eurasian arctic seas. (Arctic Biblio.)

Based on collections of the Berlin Zoological Museum, the Institute for the Exploration of the North and the State Hydrological Institute in Leningrad. Descriptions of five new species of isopods from Greenland Sea and Svalbard waters, and discussion of the distribution, in all arctic seas and the brackish or fresh waters of the Asiatic Arctic of three other species; descriptions and distribution of seven (including three new) species of Amphipoda of arctic seas. (Arctic Biblio.)


A study of crustaceans inhabiting the waters of, and near Porchnikha Bay (Barents Sea coast about 69° N, 36° E), listing forty-one species of amphipods and eight species of isopods, with some notes on habitats and distribution in other seas. Summary in German. (Arctic Biblio.)


A study of material collected in 1926 and 1927 by the Hydrographic party of the Academy of Sciences' Yakut Expedition. Fifteen species of amphipods, three isopods and two schizopods are described. Two species, Pseudalibratus birulai n. sp. and Haploops sibirica n. sp. are new. Morphology and taxonomy, location of finds, temperature and nature of bottom, closely related forms, and geographic distribution are dealt with. (Arctic Biblio.)


Contains definition of the southern limits: Newfoundland to North Cape, Norway, thence across the arctic seas to Bering Strait, Beaufort Sea and Canadian Arctic Islands waters. Classified list, with key, synonyms, references, distribution, and some descriptive notes, of one hundred eighty-two species of these crustaceans. A zoogeographic discussion of Barents, White, Kara, Laptev, East Siberian and Beaufort Seas, Baffin Bay, Davis Strait, Norwegian and Greenland Seas. (Arctic Biblio.)


A description of 25 species with identification keys and comparisons with identical species in adjacent regions. Location, occurrence and geographic
distribution are also discussed. Four regions are distinguished in the area, ranging in salinity from 33‰ to 10‰ or less. Each has its specific forms, the more common of them being listed. Their distribution at present and in geological times is discussed. (Arctic Biblio.)


A contribution based on material collected by State Hydrographic and Pacific Fisheries Institutes' expeditions to the Bering Sea and the Seas of Okhotsk and Japan. Seventeen new forms are described including morphology, morphometry and anatomy, size, color, location of find, geographic distribution, etc. (Arctic Biblio.)


Descriptions of 13 new forms, including seven new species; morphology and anatomy, size, color, sexual differences, location of finds, geographic distribution, etc., are given. (Arctic Biblio.)


Based on collections of the Russian Hydrological Institute vessel Rusanov, in the summer of 1931; descriptions of seven new species and one new subspecies. (Arctic Biblio.)


Contains an analysis of the crustacean fauna of the Kara Sea, which the author divides into seven large groups according to origin and geographic distribution; the foreign elements in the Kara Sea fauna are discussed and analyzed and their routes of immigration from the Atlantic traced. (Arctic Biblio.)

A list of 11 zoogeographically interesting or rare amphipods, with data on location of find(s), occurrence in depth, geographic distribution, etc. (Arctic Biblio.)


Descriptions of six new species, collected by routine ice-breaker expeditions, 1930-23. (Arctic Biblio.)


A study of the distribution of 182 species of isopods in the Arctic Ocean, with list and discussion of their occurrence in Barents, White, Kara, Laptev, East Siberian, Chukchi, and Beaufort Seas, Baffin Bay, Davis and Denmark Strait, and Norwegian and Greenland Seas. Summary in English. (Arctic Biblio.)


A study of these crustaceans collected in the summer 1931 from the ice-breaker Rusanov. Ninety-four forms are described, with notes on location and depth of finds, bottom, etc. Zoogeographically the material is divided into six groups. Their distribution in the regions of the area is discussed. (Arctic Biblio.)


Description of three new species and four new varieties from the Bering, Okhotsk and Japanese Seas; also a list of isopods hitherto recorded from these areas. Descriptions include morphometry and anatomy, location of find; taxonomic status, etc. (Arctic Biblio.)


Contains the results of a zoogeographic analysis of isopod fauna (124 species) of the Bering, Okhotsk and Japan Seas, with data on the seven
groups into which this fauna is subdivided by the author; their geographic
distribution and relationship with the faunas of the Arctic and Pacific
Oceans are dealt with. Summary in English. (Arctic Biblio.)

Gur'ianova, E.F. 1935d. Komandorskie Ostrova i ikh Morskaia Pribrezhnaia Fauna
i Flora. (The Commander Islands and their Coastal Fauna and Flora.)

Contains a general description of these islands in the Bering Sea, with
brief notes on their discovery and exploration, and data on their geog-
raphy, geology, climate, and the hydrological regime of the coastal
waters. Their marine fauna and flora (algae) are treated in more detail,
with notes on ecology, references to many animals and plants observed,
and comparison with fauna and flora of other northern regions (the
Murman coast of the Barents Sea). (Arctic Biblio.)

Gur'ianova, E.F. 1935e. Zur Zoogeographic der Crustacea Malacostraca des
Arktischen Gebietes. (On the Zoogeography of the Malacostracan Crustacea of
the Arctic Region.) Zoogeographica 2:555-571.

Contains detailed discussion of the distribution and various groupings
of amphipods and isopods designated as truly arctic, found in the Soviet
seas east of Novaya Zemlya; based on the rich collections made during
1928-33 by the Arctic Institute USSR. List of sixty-one species new to
Kara Sea, noting location and depth is given. (Arctic Biblio.)

(Contributions to the Amphipoda of Kara Sea.) Zoologischer Anzeiger 116:
145-152.

Based on material collected by the SEDOV, 1934, descriptions of three
new species, a list, with locations, of twenty-nine additional species
new to Kara Sea, and remarks on the presence there of eight North
Atlantic forms. (Arctic Biblio.)

Gur'ianova, E.F. 1936b. Beitrage zur Kenntnis der Isopodenfauna des Pazifischen
Ozeans. IV. Neue Isopodenarten aus dem Japanischen und Beringmeer. (Contribution to Knowledge of the Isopoda of the Pacific Ocean. 4. New Isopods of the
Japan and Bering Sea.) Zoologischer Anzeiger 114:250-265.

Contains descriptions of five new species, only one of which was taken in
Bering Sea; a list of all species known to occur in the Okhotsk and Bering
Seas, and a discussion distinguishing between the arctic Kamchatka province
and the Aleutian province. (Arctic Biblio.)

(Contribution to the Fauna of Crustacea - Malacostraca of the Arctic Region.)
A study of material collected during the voyages of ice-breakers Sibiriakov and Rusanov, 1932, and of the ships Taimyr and Vaigach, 1911-13, in Kara, Laptev and Chukchi Seas; with lists of species (including description of four new species) and locations. Summary in English. (Arctic Biblio.)


Contains a study of zoogeography of the northern part of the Kara Sea based on the collections of marine amphipods and isopods brought home by the ice-breaker Sedov in 1929-30 (collector: G. Gorbunov), ship Lomonosov in 1931 (collectors: V. Vagin and L Retovskii), and ice-breaker Rusanov in 1932 (collectors: V. Vagin and N. Kondakov). The material is divided into five zoogeographic groups: circumpolar forms, North Atlantic forms of warmer waters, fauna of polar basin, forms of the eastern Arctic and subarctic forms. Lists of typical forms are given for each zone and a list of all crustaceans arranged by the stations and expeditions; the penetration of various elements into Kara Sea is discussed (see map no. 2). Bibliography (27 items). Summary in English. (Arctic Biblio.)


Contains an annotated list, with localities, of fifteen (including with descriptions, five new) species of Amphipoda from Eurasian arctic seas. (Arctic Biblio.)


Contains a morphological sketch of the Isopoda (p. 1-11) with data on ecology and biology (p. 12-14); a brief zoogeographic survey of the Bering, Okhotsk and Japanese Seas (p. 14-32). In the special part (p. 37-273) are keys to the sub-orders, families, genera and species, and a systematic list with brief diagnoses, synonyms, critical notes, and data on geographic distribution. Index of Latin names is appended (p. 274-78). This study included 55 species of isopods native to Bering Sea and 47 species recorded in the Sea of Okhotsk. (Arctic Biblio.)


An analysis of deep-sea Crustacea of the Arctic Basin indicating that the abyssal fauna of this basin is "original, autochthonus and of relative recent age." Based on collections of the SADKO high latitude expedition of 1935. (Arctic Biblio.)
Contains the results of a study of *Mesidothea entomon*, a marine species of crustaceans (sometimes called "hog-lice") from various northern (including White, Bering, Okhotsk and Chukchi) seas, Siberian river estuaries and glacial lakes. The author deals with the influence of environmental factors (chiefly salinity) on its variability (arctic material on p. 116-17, 119-20, 124, 128-29). Summary in English. (Arctic Biblio.)

Description of twenty-five new species of these crustaceans collected by the ice-breaker Sadko in 1935 and 1937. Station list shows locations and depths. Summary in English. (Arctic Biblio.)

Contains a list of 37 species of small crustacean amphipods of the family Stenothoidae, native to the northern Pacific, with data on their distribution in Chukchi, Bering, and Japan Seas and in North American waters. Descriptions are given for 18 new species, including 13 inhabiting the Bering Sea and one from Bering and Chukchi Seas. In a supplement, p. 322-25, is a systematic list of 137 species of Stenothoidea with data on their total distribution. (Arctic Biblio.)

Theses of a paper (delivered to the Second All-Union Geographical Congress, Leningrad, 1947) pointing out that the present arctic fauna represents a merger of two ancient arctic faunas originated in Kara Sea (Siberian Center) and in Chukchi and Beaufort Seas (Chukchi-American center), with some added elements from Atlantic and Pacific Oceans. (Arctic Biblio.)

Gur'ianova, E.F. 1950. K Faune Ravononogikh Rakov (Isopoda) Tikhogo Okeana, V. Izopody po Sboram Kamchatskoi Morskoi Stantsii Gosudarstvennogo Gidrologicheskogo Instituta. (To the Fauna of Isopod Shrimps [Isopoda] of the Pacific...
Ocean, V. The Isopods from the Collections of the Oceanographic Station of the State Hydrological Institute.) Akademiia Nauk SSSR Zoologicheskii Institut, Issledovaniia Dal'nevostochnykh Morei SSSR. 2:280-292.

Contains a description of 18 species of these crustacea (4 of them new), collected during 1932-35 on the shores of southeastern Kamchatka. The new species described here are: Janiropsis setifera, Gurjanova sp. n.; Nannomiscella vinogradovi, Gurjanova sp. n.; Idothea spasskii, Gurjanova sp. n. and a fourth species described earlier. In addition to the description (morphology), data are offered on occurrence, geographic distribution, ecology, etc. (Arctic Biblio.)


Contains (in the general part, p. 5-145) a systematic index of the families and genera of marine amphipodous crustaceans of the suborder Gammaridea, followed by data on the systematic position, a morphological sketch, remarks on phylogeny and evolution, details of geographic distribution, notes on the biology and economic importance, and bibliography (125 items). In the systematic part (p. 147-1010) are tables for the determination of families, genera and species and brief diagnoses of all known species with literature citations and data on habitat and geographic distribution. An index of Latin names is appended (p. 1011-1029). Distributional data for the northern waters of the USSR are given (p. 69-106), lists of arctic and Far Eastern (Bering and Okhotsk Seas) species (p. 123-33), and diagnoses of several arctic forms. (Arctic Biblio.)


Contains a systematic list of four species of marine crustaceans collected in 1946, southeast of Kamchatka Peninsula, at a depth of 4100-4200 m; and a key to the species of the genus Cyphocaris. (Arctic Biblio.)


Divisions of the White Sea, including the Gulf of Mezen, bottom invertebrates and fishes, physical conditions and their ecological effects are outlined. Zoogeographic nature and origin of the fauna, their marine
zones and principal biocenoses are considered. Mezen is compared with other bays of the White Sea; its littoral is dealt with also. (Arctic Biblio.)


Discusses some bionomic and biogeographical conclusions based on Russian research (cited in the references) during the past 30 years along the northern and eastern coasts of the Soviet Union. Principles of vertical zonation of the littoral by tidal sea-levels (Vaillant) and by distribution of species and communities (Stephenson) were applied to the various coastal regions studied, and are illustrated by a few examples from northern seas, e.g., Commander Islands. The most specific feature of the Far Eastern Seas is the existence of a horizon between the littoral and sublittoral that is exposed only during winter (Oct-April) ebb tides. (Arctic Biblio.)


Reviews earlier faunistic studies in the general area, presents records of some 50 isopods and 250 amphipods collected during 1934-1956. The material is presented in taxonomic order and each form is dealt with as to date and location of find, depth, water temperature, and geographic distribution. (Arctic Biblio.)


Comparative studies of the intertidal and sublittoral zones along the coasts of the Arctic Ocean (the Barents and White Seas) and the North Pacific from the Bering Straits to Hainan and Gulf of Tonkin (South China Sea) show certain patterns in the changes of the fauna and flora in the vertical distribution of species, all of which are related to water movements, in the form of surf and currents. (Author.)


Contains data on systematics and ecology of the marine burrowing worm of the genus Balanoglossus including B. mereschkowskii native to the White Sea, Murman coast and Novaya Zemlya waters; and another unnamed species of B. found in the central section of the White Sea. Summary in German. (Arctic Biblio.)

Investigations of State Hydrographic Institute 1925, and others on the south west coast 1923-1927, and the topography of this bay (70°41' N, 54°40'E) are outlined. The nature of the bottom and hydrology of the bay, animal distribution and faunistic nature of the neighboring sea, of the channel and central bay, also fauna of the shore pools and those further inland are described. Trawling and dredging reports from the stations investigated are presented with list of animals found. The closed part of the bay showed signs of stagnation and so did some pools. The fauna is largely arctic with some boreal and warm-water elements. (Arctic Biblio.)


A detailed description of the areas investigated: Teriberka, Porchinkha Bay, Rynda and Zolotaya and their fauna. In the first area, the littoral of Lodeynaya Bay was found to be very rich, that of the others the more depleted the more they are exposed to wave action. Salinity varied from 34-30‰ to 0 in the river mouths. The effects of sea action upon animal distribution, horizontal and vertical, and upon the forms of some animals is also discussed as well as the effects of the nature of the bottom. (Arctic Biblio.)


Account of the tidal zone of the northwest coast of Kola Peninsula, its flora and fauna. The hydrographic and ice conditions as well as the nature of the bottom in the area studies are dealt with. Detailed descriptions follow of representative sections of the area and their bionomics. Six ecological types are distinguished and described, largely on the basis of salinity and effects of wave action. Two of the types comprise "little brooks" and pools of the tidal zone, characterized by strong fluctuations in temperature and salinity and by a specific fauna and flora. (Arctic Biblio.)


List, with localities, notes on distribution and remarks, of twenty-four species of annelid worms collected in the Chukchi, East Siberian and Laptev Seas; with list of stations; bibliography (18 items). (Arctic Biblio.)

A listing of the cumacea found on the Danish Ingolf expedition with notes on the specimens and their distribution.


List cumacea and decapods collected by H.A. Larsen southwest of Victoria Island from 1936-1937. Each species is listed with locality, western range limit and miscellaneous remarks.


Lists and describes arctic ascidians with locations.


This report concerns 22 species of pycnogonids found between Point Barrow and the Baffin Bay-Davis Strait region, based on collections by the Calanus expeditions since 1947 and by G.E. MacGinitie at Point Barrow. One new species, from Point Barrow, is described. Three basic distribution patterns are recognized: a boreal, circumarctic or panarctic distribution, a high arctic and deeper boreal distribution related to the North Atlantic - Norwegian Sea areas, and a Pacific boreal distribution. Neither of the latter two have circumpolar components. No relationship between arctic and antarctic Pycnogonida can be demonstrated and several arctic species carry their young until they are much more advanced than do antarctic species. (Author.)


The first kinorhynch reported from within the Arctic circle was Centrodere arcticus (Steiner, 1919) n. comb. This species was originally described in one of several invalid "larval genera," gen Centropsis Zelinka, 1907. Fam. Echinoderidae Butschli, 1876 has been reported from as far north as Bergen, Norway and the northern Baltic Sea, its southern limit of distribution is South Georgia Island in the Southern Atlantic. Members of the single genus within this family, Echinoderes Claparede, 1863, are widely distributed and are common representatives of the phylum Kinorhyncha. The species described in this paper is the first member of the gen Echinoderes reported from within the Arctic Circle and is from the greatest recorded depth for the phylum. (Arctic Biblio.)

Of the thirty-five species of sea spiders described, fifteen (including thirteen new) species were found in Aleutian waters, Bering Sea, the Gulf of Alaska, and North Alaskan Waters (Arctic Biblio.)


Reports studies of mysids on the Arctic Slope and adjacent continental shelf off Barrow in summer 1961. Several localities, their physical and chemical properties and faunal compositions described, were investigated as possible habitats of Mysis. M. relicta were found in abundance in a freshwater lake, a marine lagoon, and a metahaoline pond; the species apparently prefers shallow inland waters to the open sea. The absence of mysids from several freshwater lakes is attributed to isolation. Dispersal in this unglaciated area is considered, also possible interspecific competition between M. relicta and litoralis. (Arctic Biblio.)


Comparative morphological study of own and museum collections, from Alaskan (esp. Nuwuk Pond near Pt. Barrow) and West Greenland waters. Ps. littoralis, Ps. nanseni and Ps. glacialis are recognized as genuine species, apparently of circumpolar distribution. Ps. birulai could not be definitely classified for lack of Caspian material. (Arctic Biblio.)


On the basis of samples from North American Pacific coasts, from northern Alaska and from Japan, it is stressed that no doubt remains as to the validity of the three mysid species Neomysis intermedia (Czerniavsky), N. awatschensis (Brandt) and N. mercedis Holmes. N. mercedis appears as a North American Pacific Species, N. awatschensis as an Asiatic Pacific to Alaskan species. They are all rather euryhaline and eurythermic. (Author.)


Finds of the tubificid worm Alexandrovia onegensis Hrabe, 1962 in northern Alaska have led to a revision of the subfamily Telmatodrilinae and the genus Telmatodrilus Eisen, 1879 as grouped by Brinkhurst. A summary of the distribution and ecology of the worms was also given. (Author.)

The report contains a collection of scientific papers from two successive marine ecological baseline cruises to the Western Beaufort Sea (August-September 1971 and 1972). Preliminary results of the physical, chemical, biological, and geological data are presented and interpreted. The results indicate that the data were collected in a marine ecosystem that is still in a relatively unpolluted state. The data should provide a base for assessing the effects of pollution from future development, especially from petroleum. (NTIS.)


Describes 12 lamellibranchs dredged from shallow waters between Point Barrow and Baxter Island in August 1953. Geographic distribution of the species, four of them new to the area, is discussed. Earlier work on area is mentioned. (Arctic Biblio.)


Lists 11, mostly common species of bryozoans collected in August 1953 between 145°14' N and 155°48' W; manner of occurrence and general distribution are noted. Location of each of the 12 stations, depth, and sediment type from which material was collected, also presence of kelp are indicated. (Arctic Biblio.)


Contains bottom photographs and a discussion of the animals and evidence of animals seen in the photographs. The authors conclude from the photographs that bottom life is less abundant than in the Atlantic at similar depths. Also includes geological observations.


Over 2,000 usable bottom photographs have been taken in the western Arctic Ocean. The 87 stations cover the major geomorphic provinces of this part of the Arctic Basin, including the Alph Cordillera, Mendeleyev Ridge, and Canada Abyssal Plain as well as smaller features. The ridge and plain provinces differ markedly in their bottom characteristics. Scattered rocks, living animals and indications of bottom current are most prevalent on the ridges. Trails are most abundant on the abyssal plains. The differences are attributed to bottom current distributions and turbidity currents. Bedrock outcrops are observed on the tops of two knolls on the Mendeleyev Ridge. (Author.)

Lists with descriptions, locations and synonymy, of sixteen species of tunicates from fourteen dredging stations off the Alaskan coast and in Dolphin and Union Strait, off the Canadian arctic coast. (Arctic Biblio.)


Contains a critical revision of 67 species of polyclad flatworms, comprising 48 Acotylea and 19 Cotylea native to the Pacific coast of North America; with data on material, form, color, eyes, digestive system, copulatory apparatus, differential characters, distribution, holotype and remarks. Nine new genera, 36 new species and one new variety are recorded, including the following from Alaskan areas: Kaburakia excelsa (Sitka), Notoplana atomata (Pt. Barrow), N. Longastyletta new comb. (Aleutian Islands), N. sanjuaniana (Pavlov Bay), and Acerotisa arctica n. sp. (Pt. Barrow). (Arctic Biblio.)

Contains in the general part, a systematic index to marine species of the class Loricata (p. 5-6); followed by an introduction (p. 7-43) giving a brief characterization and morphological and anatomical sketch of loricata, biology, phylogeny, geographic distribution, and methodics of determination; also a bibliography (107 items). In the systematic part (p. 48-104) are given keys to the orders, families, genera and species, and descriptions of 42 species of chitons (one family, two genera and 11 species are new to science), with synonyms, literature references, critical notes and data on ecology and distribution. Index of Latin names in appendix p. 105-107. Many species native to northern waters of the USSR and adjoining seas are included in this work (see table 9 on p. 38-39). (Arctic Biblio.)


Oceanographic stations were occupied by the USCGS Glacier in the eastern Chukchi Sea during 25 September - 17 October 1970. The currents and distributions of physical and chemical variables are described. Geologic sampling was carried out in the same area, using a variety of field techniques to define the sediment distribution pattern and particle transport processes. Water turbidity, bottom sediments along with current measurements and water mass data are discussed. Pelagic bird and mammal observations were made in the areas, providing new fall distributional feeding information for the biologically little known area from Point Barrow to Cape Lisburne. Preliminary results of studies of sedimentation, macrobenthic population and trace metal chemistry of sea water of the east central Chukchi Sea are described. Sixty-two categories of zooplankton were identified from 77 vertical tows with the results of the data summarized in two tables and three charts. Fish were collected on 20 stations. Lists of species captured are presented. (NTIS.)


Describes pertinent construction characteristics of the vessel and reviews the 1960-1963 scientific work, noting personnel, Map 6 references. (Arctic Biblio.)


Scientific appendices (17) are presented in V. 2, accompanied by charts and tables of observations. Echinodermata, Vermes, Crustacea and pteropod Mollusca: notes (edited) and sketches by J.W. Fewkes of marine animals, collected near Fort Congor, May 17-June 8, 1883; identification impossible, but some never observed so far north, p. 47-53. Mollusca: Notes by W.H. Dall on about 14 specimens found near Fort Conger in 1883, p. 57-58. (Arctic Biblio.)


Discusses briefly Soviet finds of this sea class (20 species, 5 families) and their body systems, anatomy, sexual conditions, taxonomy, including relations. (Arctic Biblio.)


Account based on material collected in 1952, also repeatedly since 1946. Earlier studies were reviewed and data given on species making up the benthos. Its main faunistic complexes, their biomass and occurrence, species composition of the complexes quantitative distribution of the benthos, and distribution of the species are treated in turn. The Bay was found to be rich in benthonic forms (mostly boreal and arcto-boreal) but rather poor in quantity. (Arctic Biblio.)

Contains in chapters 1-4 (p. 1-63), a study of the biology and anatomy of marine annelid worms of the families Hermellidae, Sabellidae and Serpulidae and in Chapters 5-7 (p. 63-183), data on their systematic position, with a list of about 150 species from various waters (these species and one variety described as new) with synonyms, descriptions of new and more interesting species from arctic seas, Greenland and Bering Seas; a general bibliography (236 items). (Arctic Biblio.)


Reports eight genera (names) and 16 species, including two new forms, collected from the Basin floor, 1952-1955. Some show evidence of stratigraphic and geographic displacement. Noteworthy are the thin carapaces, extreme development of spines and other ornamentation, also absence of instars in some forms of these crustaceans. (Arctic Biblio.)


From the top 3 cm of 64 central Arctic Ocean sediment cores, 33 samples have been found to contain ostracodes. The cores were taken from depths between 1351 and 3812 m. Of the remaining 31 barren cores, 29 were taken from depths exceeding 3600 m in the Canada Basin. All 19 ostracode species constitute a bathyal fauna which extends to approximately 3000 m. The bathyal fauna is found along Alpha Cordillera and Chukchi Rise. Only Cytheropteron bronwynae n. sp. and Krithe bartonensis (Jones) occur below approximately 3000 m. These two species compose the abyssal fauna. The central Arctic ostracode faunas are more similar to the faunas of Scandinavia than to faunas of the northern Pacific. (NTIS.)


From Jørgen Brønlund Fjord, North Greenland 28 species of amphipods are listed, one of which is new to science, viz. Byblis arcticus. Four known species and one genus are new to Greenland waters. Notes on breeding biology are made where possible and maps of distribution of Monoculodes schneideri G.O. Sars and Aceroides latipes G.O. Sars are presented. Anatomical and morphological problems of Corophium clarencense Shoemaker are mentioned briefly. (Author.)

From Jørgen Brønlund Fjord, North Greenland (82°10'N, 30°30'W) 11 species of cumacea are listed as a result of investigations during the Fourth Peary Land Expedition in the summer of 1966. One species is new to science, viz. Campylaspis stephenseni. The male of Leucon spinulosus H.J. Hansen is recorded and described for the first time. A possibly new species of the genus Eudorella is described, but in view of recent papers it is referred to as Eudorella sp. only. Notes on breeding biology are made where possible. (Author.)


From Jørgen Brønlund Fjord (82°10'N, 30°30'W) 29 species of Crustacea Malacostraca are listed: 2 Decapoda, 3 Mysidacea, 15 Isopoda, and 9 Tanaidacea. Two species are considered new to science, viz. Nannoniscus hansenii and Pseudomesus sp. (nov. sp.). Two genera and 9 species are recorded for the first time from Greenland waters. (Author.)

Populations of *Globigerina pachyderma* in Arctic bottom sediments exhibit distinct morphological differences from those in Antarctic bottom sediments. Arctic populations are less heavily encrusted, more lobulate, have a higher arched aperture, and have a dominance of 4 1/2-chambered form (umbilical view), compared with a dominance of 4-chambered forms in Antarctic populations. Both are dominated by sinistrally coiling forms and they have similar size characteristics. Because of a shortage of morphological data on *G. pachyderma* in subarctic and northern hemisphere subtropical areas, it is not possible to determine whether these morphological differences result from phenotypic variation or subspeciation. Characteristic ranges of variation of *G. pachyderma* from both areas are illustrated by scanning-electron micrographs. (Author.)


From material collected in the southern part of the Barents Sea between 1957 and 1959, 48 echinoderm species were found. *Ophiopholis aculeata, Ophiocantha bidentata, Ophiura sarsi, O. robusta,* and *Strongylocentrotus droebachiensis* were found to be at more than 50% of the stations. On the basis of Echinodermata distribution, which depends upon temperature and food (detritus) distribution, the southern part of the Barents Sea can be divided into four regions: western, eastern, southeastern, and deep water. The region of the highest biomass of Echinodermata (60-90 g/m²) lay between Gusinyi Bank, Novaya Zemlya, and Kolguev Island. (Biological Abstracts.)


The report is a station list of the biological collections made from Fletcher's Ice Island T-3 in the Arctic Ocean from June 13, 1965 to May 24, 1966. The marine biology program was carried out by a total of 280 stations, the majority of collections were planktonic. Each station includes its latitude, time and data of sampling, gear used, and sample and bottom depths. (Author.)


Contains a systematic list of 81 bryozoans collected by the author in 1897 during his work at the Biological Station in the Solovetskiye
Islands, White Sea, including descriptions of Membranipora heterospinosa and Schizoporella ussowi n spp.; synonymy, critical notes and data on local distribution. (Arctic Biblio.)


Contains a systematic list of 76 bryozoans collected by Dr. A.E. Ortmann in Inglefield Gulf, northwest Greenland, during the Peary Relief Expedition in 1899 under Prof. Wm. Libbey; includes a description of Schizoporella ortmanni n. sp. (Arctic Biblio.)


Contains a preliminary report on the bryozoans (moss-like, colonial animals) collected by the Vega (Nordenskiold, 1878-79); Sarja (Toll', 1900-1902), Taimyr and Vaigach (Vilkitskii, 1914-1915) expeditions. 108 species are listed, nine of them new. The localities where each species was found, are given, together with a description of new forms or variations. The geographical distribution of the species is graphically summarized. (Arctic Biblio.)


Contains description of three new genera, 39 new and a few little known species of bryozoans, mostly from the Russian arctic seas, but covering practically all arctic waters. (Arctic Biblio.)


Lists 223 forms from 70 years collections: 1879-1949, with notes on locations and geographic range, and depth of occurrence. The Bering, Okhotsk and Chukchi Seas harbor these invertebrates. (Arctic Biblio.)

The identification key is a presentation of knowledge about the Bryozoan fauna of the northern seas (Polar Basin). This fundamental work is a product of about fifty years of research carried out by the scientist, German Avgustovich Kluge, and is based on sizable collections from several Soviet Arctic expeditions beginning from the first investigations of the expedition for Scientific Fishery Research at the coasts of Murmansk (ENPIM) which was organized at the end of the last century and the beginning of the present one, and the Russian Polar Expedition on the schooner Zarya in 1900-1902, and the subsequent high latitude expedition of recent years on expedition ships Sadko, Sibiryakov, Sedov, Litke, and others, as well as the Drifting Polar Stations (SP 1-4), which had collected sizable and extremely rich material from all regions of the northern seas. (NTIS.)


Contains a discussion of three zoogeographical zones of the White Sea established by the author, a comparison with subdivisions of other naturalists (S.M. Gertsenshtein and K.I. Khvorostanskii) and with similar zones of the Barents Sea; marine species typical for each zone are listed. (Arctic Biblio.)


Based on collections of recent material made in 1898-99, by the Expedition for Scientific and Economic Investigation of the Murman Coast, and on post-Pliocene collections in the White Sea region, Novaya Zemlya and the Murman coast. Discussion of the water temperature and recent molluscan and brachiopod faunas of the southern Barents and White Seas (p. 4-30); the localities and post-Pliocene collections of (a) Rybachiy Peninsula, Port Vladimir, Kildin Island, the Kola Bay region, the shores of Notozero (lake), and elsewhere along the north coast of Kola Peninsula (p. 31-48); (b) the White Sea coasts (p. 48-105); (c) the Mezen, Chechskaya and Pechora Bay regions (p. 105-140); and (d) Novaya Zemlya (p. 141-48). Remarks on the 105 species of post-Pliocene fauna, relating them to interglacial, late glacial, and post-glacial subsidence in northern European Russia and discussing paleoclimatic changes of the hydrologic regimes of the bordering seas. (Arctic Biblio.)

Contains a report of the find of a mollusc, *Mytilus edulis*, a common representative of the littoral and warm water faunas in the deep and cold waters of the White Sea: with observations on the temperature and environmental conditions, and a discussion of the vertical distribution of this mollusc. (Arctic Biblio.)


A small but most northerly collection obtained (north of 80°N), four species of pelagic polychaetes included. (Arctic Biblio.)


Records 16 forms of these crustaceans collected by the High Latitude Arctic Expeditions of 1955-1958. Location of finds, water temperature, vertical and geographic distribution, zoogeographic aspects, etc. are considered. (Arctic Biblio.)


Lists bottom animals collected on various recent expeditions (1948-55) from depths down to 4000 m. The animals are listed in three groups: abyssal (40 forms), bathyal (37), and continental-shelf group (65). Occurrence and geographic origin are noted. (Arctic Biblio.)


A study of 191 species, 17 families, from various Russian collections and sources. The general part (p. 13-45) deals with the history of Russian study of sponges; anatomy and morphology of siliceous-horny sponges; propagation, embryology and growth; ecology; geographic distribution (largely subarctic and arctic) and vertical distribution. The succeeding, taxonomic part contains deys and information on morphology and anatomy, geographic distribution, synonyms, etc. (Arctic Biblio.)

Account of 92 forms, with notes on synonyms, location and depth of finds, morphology and geographic distribution. Data are also tabulated within a taxonomic framework. (Arctic Biblio.)


Fauna at depths of 50-800 m include arctic-boreal, panarctic, high arctic, lower arctic, subarctic, boreal, and bathybial species. Near northern Spitzbergen and Franz Josef Land and northeastern Greenland arctic-boreal and panarctic species predominate at 50-200 m (73%) with bathybial and high arctic species constituting 11% and 8.5% of the fauna, respectively. The small number of high arctic species which are not typical of the high arctic region is accounted for by the effect of Atlantic water. Even though the bottom temperature is high enough (as high as 4.1°C), there are hardly any boreal species. Arctic-boreal and panarctic species also predominate at depths of 200-800 m, but there are quite a few subarctic, bathybial, and even true boreal species at these depths, but not many high arctic and lower arctic ones. Subarctic species occur in the south, generally along Tomson Shelf, and in the north to the northern parts of the Kara and Laptev Seas. They include "amphisubarctic" species which apparently originated in the deep ocean, migrating into the part of the Arctic near the Atlantic in postglacial times. Among the bathybial species there are both autochthonous and allochthonous (deep ocean and atlantic) species. The latter migrated in the prequaternary period and later. Deep-water North Atlantic bathybial species are not really boreal. In their ecology they resemble arctic-boreal or subarctic species and probably passed into the depths of the Atlantic from the bathyal Arctic. North Atlantic boreal species have not passed into the bathyal region of the Polar Basin east of Franz Josef Land, but deep arctic species which resemble them (pairs) have been found earlier for fish by A.P. Andriyashev. They are descended from boreal species during the epoch of the intraglacial boreal transgression and at later times. The limit for the occurrence of boreal species in the Arctic lies between Spitzbergen and Franz Josef Land, and their migration route pass along the western shores of Spitzbergen. The eurybathic species is abundant. This abundance causes some leveling out of the vertical zonation in the benthos and is related in its origin to "salt pulsations" of the quaternary period which sometimes drove pelagic fauna into the deep water and sometimes made it possible for them to settle in shallows again. The levelling effect of a warm current on the fauna in the 200-1500 m zone and the rising of deep water into the shallows facilitates the development of
eurhythmic conditions. The abyssal fauna in the Polar Basin are reviewed. This fauna consists of abyssal species, bathybial species descending into the abyssal region, and euryhythmic sublittoral species. A list of these groups is presented: 146 spp. including 41 abyssal species, 40 bathybial ones, and 65 sublittoral species. Six species are very characteristic for the abyssal region. The fauna at the upper limit of this zone are found near northern Spitzbergen and Franz Josef Land at depths of 1500-1800 m, and those at the lower limits of the bathyal zone at 110-1300 m. A transitional abyssal-bathybial zone lies between them. Apparently these same boundaries pass quite close to the Novosibirskie Islands and the North Pole. In the sector near the Pacific Ocean the upper limit of the abyssal zone is found at a depth of 1200 m or above. The benthos in the Scandanavian Trench is much more varied than in the Polar Basin although the boundaries of the abyssal zone and the basic background of the fauna are the same. In the northern part of the Greenland Sea Bryozoa and a number of subarctic and bathybial species were found which do not descend into the abyssal zone in the Polar Basin. (Biological Abstracts.)


A summary of the results of this expedition. Pages 81-96 discuss the bottom fauna. The main purpose of the collections is to compare the deep-sea bottom fauna north and south of the submarine ridge across Davis Strait. Littoral and sub-littoral results are discussed separately from deep water results.


The material presented in the paper shows that the biomass of some invertebrates with a long life cycle, as well as that of the benthos of separate benthal coenoses (in particular, coenoses of Modiolus modiolus) in the White Sea appears to be higher than the corresponding biomass in the adjacent Barents Sea. This fact proves the incorrectness of V.V. Kuznetsov's opinion on the total depression of organisms of a lasting life cycle in the White Sea. (Author.)


Study of one of the main groupings in the benthos of this area based on over a hundred bottom samples collected in 1950 and 1951. Forms composing this association and their percentage, their biomass and zoogeographic origin, leading forms, total biomass in their associations, etc., are considered. Tables, graph, 14 references. (Arctic Biblio.)

Account of field and aquarium work, with five main plant-feeders studied. The intensity of their food intake was found to depend on the season, age, and physiological condition. In general, there was little food selection among the animals, and all easily passed to detritus feeding. A relation between life span and "feeding index" was detected; and the invertebrates were estimated to consume some 35% of the annual seaweed production. (Arctic Biblio.)


The author uses this widely-occurring mollusc as a representative, typical of animals living on seaweeds. He traces its biological cycles of migration; reproduction and rate of reproduction; growth and maturation; rate of survival of offspring, and total biomass production of this species per area. Bibliography (25 items). (Arctic Biblio.)


Contains a biological and ecological study of this mollusc living on Laminaria saccarina abundant in the littoral zone of arctic seas. A general characterization is given of the Laminaria group for various months in Dal'ne-Zelenetskaya Bay on the eastern Murman coast and in Gridina Bay (Kandalaksha) of the White Sea. Then follow observations on the life cycle of Margarita helicina (tables 5-7) and its productivity. (Arctic Biblio.)


Contains a study of this marine mollusc, Lacuna pallidula, carried out at the Murman Biological Station in 1939-41, with data on geographic
distribution (horizontal and vertical), biomass and its fluctuations, life cycle and productivity. (Arctic Biblio.)


Contains a study of the relation between the fertility and the rate of growth of some marine invertebrates, Eualus gaimardi, Hyas araneus and Littorina saxatilis, on the eastern Murman coast of Barents Sea and in Kandalaksha Bay in the White Sea. It is concluded that with the increase in the size of females, their fertility is also increased, but not in the same ratio. The intensity of the growth and fertility is also influenced by environmental conditions. (Arctic Biblio.)


A study of the barnacle Balanus balanoides of the east Murman waters. Summers with small temperature amplitude produced earlier maturation, greater fertility and larger animals. Similar conditions were observed in the hermit crab Pagurus pubescens and in a number of molluscs. (Arctic Biblio.)


Contains a discussion of life span, body size and productivity of some bottom invertebrates and fishes of the White and Barents Seas; also rate of growth of a series of animals from both seas including cod and herring. A practical application of the findings is suggested. (Arctic Biblio.)


A study of invertebrates with long life cycles (mainly bivalves and cirripedians) led the author to the conclusion that within the past hundred years or so, there occurred in the White Sea a decline in their range, growth and longevity and the degeneration of disappearance of some species. These changes he attributes to the mouth of this sea becoming shallow, which caused an increase of temperature and salinity ranges, and to an increase of O\textsubscript{2}- deficiency due to accumulation of organic sediments. He suggests that these changes may have similarly affected some fish and fisheries. (Arctic Biblio.)
Kuznetsov, V.V. 1958. O Nekotorykh Osobennostiakh Biologicheskoi Produktivnosti Bespozvonochnykh s Dlitel'nym Zhiznennym Tsiklom v Severnykh Moriakh. (Some Peculiarities of Biological Productivity among Invertebrates of Northern Seas with a Long Life Cycle.)

Contains discussion of life span among various groups of invertebrates of the Barents and White Seas; length of life of the same species at various latitudes and environments. Biomass and productivity are considered; the productivity of the sea (or its parts) cannot be expressed by its biomass alone. (Arctic Biblio.)


Comprehensive study based on author's long activity in this area and on other sources. Exploitation of the White Sea resources is reviewed from earlier times (p. 7-30), particularly the herring, navaga and salmon fisheries. The geological character of the basin and adjacent areas is outlined (p. 31-68), and some hydrometeorological particulars given (p. 69-111) including ice conditions and long term climatic fluctuations and their biological effects. Biological features of the marine flora are treated in some detail (p. 112-78), viz. phytoplankton and phytobenthos, Fucus vesiculosis, F. inflatus, and J. serratus. Ascophyllum nodosum, Laminaria saccharina, and other seaweeds and flowering plants. The invertebrates and fisheries are similarly treated (p. 179-291); the latter part of this chapter (p. 276 ff.) dealing with such general features as: size, numbers and whether they are increased or reduced, also growth, life cycles, life span etc. Appended are alphabetic lists of authors, localities, and scientific names. (Arctic Biblio.)


Describes in detail the geographic distribution of this arcto-boreal, circumpolar crustacean, its habitats, population (two) in the White Sea, and geographic races (three). Reproduction, planktonic stage, size and fertility variations in the Barents and White Seas are reported, as are growth, size and sex composition during female maturity in these seas. Age at maturity, number of reproductions, life span and morphology of geographic races are also considered. (Arctic Biblio.)

Extensive study covering over eighty invertebrates of the arctic arctoboreal and boreal waters. The high amplitude of temperature tolerated by adult forms is stressed as well as the relationship between temperature, latitude and period of oviposition and hatching. The effect of low temperature in slowing down embryonal and larval development is also discussed. (Arctic Biblio.)


Study based on material collected in 1946-1953 and some other sources. The area covered by author's collections is the White Sea and a "tongue" of the Barents extending up to 72° n off southern Novaya Zemlya. Decapoda p. 7-94, Amphipoda p. 95-188, Isopoda p. 189-212, and Cirripedia p. 213-32 are treated in turn. Each species is dealt with as to frequency, horizontal and vertical distribution, seasonal fluctuation in numbers, size range, rate of growth, reproduction and development. An appendix deals with size distribution and fertility in different areas and depths studied. (Arctic Biblio.)


The paper discusses the predominance of benthos groups within trophic zones and their distribution patterns in the Bering Sea. The trophical zonation of the bottom fauna in the Bering and Okhotsk Sea and the Pacific coastal line of Kamtshathka and North Kurile Islands are compared. A correlation between the trophic zones and biocoenoses was also studied. The distribution of trophic zones along the coasts of continents is discussed and charts showing the trophical zonation of the bottom fauna in the Asov and Baltic Sea are given. (Author.)


A record of Monoculodes minutus Gurjanova, previously unknown in the Laptev Sea, as well as of Oediceros minor Gurjanova and of Senecella calanoides Judey in stomachs of Whitefishes and hydrobiological samples is reported. (Biological Abstracts.)

The authors discuss about 90 species in regard to occurrence, common substrate or medium preferred, reproduction season, depth of habitat and other biological and ecological data. (Arctic Biblio.)

Kuznetsov, V.V. and T.A. Matveeva. 1948. Sezonnye i Sutochnye Izmeneniia Aktivnosti Napadeniia na Primanku u Morskikh Besposvonochnykh. (Seasonal and Diurnal Fluctuation in the Reaction of the Marine Invertebrates to Bait.) Priroba 3:66-68.

Contains results of a study carried out in the White and Barents Sea (eastern Murman) on the activity of marine invertebrates in taking bait: the most active species in both seas are Anonyx nugax and Orchomenella minuta; the diurnal activities of all investigated species are different (tables 1-4); they are not influenced by the tides apparently, but it is quite possible that the chief factor in fluctuation of activity is solar radiation; the results of the study are inconclusive. (Arctic Biblio.)
Condensed information on Soviet research in recent years. Major results are listed of studies on bottom topography and geological history, dynamics and chemistry of water masses, ice drift and currents, ice conditions, heat exchange, biology. (Arctic Biblio.)


List, with bibliographic notes and data on distribution, of ninety-one species, from localities ranging between the Alaskan arctic waters, Bering Sea, Aleutian waters, Gulf of Alaska, Davis Strait, and Hudson Bay. (Arctic Biblio.)


Marine, fresh-water and terrestrial molluscs found in Canada and adjacent Alaskan and Greenland waters, and Sea of Okhotsk, are listed. References, type locality, and exact range are given for each form. The new species confined to the "recent" are included. Tertiary range of living species is given. A selected bibliography (p. 347-77) and alphabetical index of genera and species are appended. (Arctic Biblio.)


Part I: Discussion of the larval shells with descriptions, illustrations and localities. Part II: Discussion of thirteen Cephalaspid species with revisions of descriptions and a key to the species.


Describes fish yields in this inlet including the Taz estuary, earlier studies of their benthos, and the latter's role as find food. As basis of the present study, over 250 samples collected in 1958-1960 were investigated. Distribution of the main forms and benthic feeding grounds are outlined. Fish utilization of benthos and biomass of the latter are
discussed. The average biomass of the bottom fauna was not rich during the period studies; the richest area was in the south. Appended (p. 41-75) are tabular data (on hydrological conditions, species, distribution, quantity, biomass, vertical migration, fish food, etc.) as well as the literature applicable to this and to a companion paper infra. (Arctic Biblio.)


Lists arctic branchiopods with locations.


Lists arctic nematods with locations.


Contains a study of foraminifera dredged in the summer of 1950 from the ocean bottom off Pt. Barrow northern Alaska, supplemented by material collected by the Albatross in the Arctic and sub-Arctic, and by Capt. R.A. Bartlett in Greenland and Canadian arctic areas. Introductory part (p. 1-10) deals with previous work; collecting stations; character of the Barrow fauna; and factors limiting its distribution. This is followed by systematic descriptions and illus of 110 species belonging to 20 families and 56 genera; six genera and 21 species are new. (Arctic Biblio.)


Notes of 50 species so far recorded in this area, 26 of them new, and one genus, Pavlovskoela, new. Species distribution in the individual seas (Bering, Okhotsk), zoogeographical origin, etc. are considered (Arctic Biblio.)


Monograph in two parts, the first (p. 3-79) offers a short description of the group and account of the morphology, anatomy and biology, the latter including movement, food and respiration, multiplication and growth. Geographic distribution and ecology inclusive of the arctic regions (p. 44-58) are discussed, as well as general classification and phylogeny, methods of collection, preservation and study. Pt. 2, the taxonomic part, presents identification tables, synonymy, descriptions
of sexual dimorphism and geographic distribution. Some 150-200 forms are treated in turn. An index (scientific names) is appended, and a taxonomic guide to the species precedes the study proper. (Arctic Biblio.)


Records finds of five, six and four species respectively of these crustaceans, with notes on location, depth, numbers retrieved and geographic distribution. The ecology and biology are also discussed and the four species of euphausids dealt with in detail as to occurrence, size, and reproduction. (Arctic Biblio.)


The fauna of marine bivalve molluscs of the shallow water region of the Canadian Central and Eastern Arctic was studied on the basis of extensive collections of the Fisheries Research Board and the National Museum of Canada, identified by the author, as well as on the basis of materials in museums on this continent. In a total of 1000 samples from the region studied, sixty-two species of bivalves were found, redescribed, and their areas of distribution mapped. (Dissertation Abstracts.)


Lists the members of this echinoderm group in the arctic with locations.


Lists arctic holothuroids with locations.


Six species of ascidians are recorded from Jørgen Brønlund Fjord, North Greenland, one of which, Cnemidocarpa squamata n. sp. is new to science. The horizontal the vertical distribution of the ascidians within the area is reviewed. (Author.)

Contains notes on work done for U.S. Office of Naval Research by the writer, assisted by his wife and H. Feder. Plankton was sampled up to 20 miles offshore. (Arctic Biblio.)


Study based on observations and material collected during 1948-50. Earlier investigations, location and facilities of the Arctic Research Laboratory maintained by the U.S. Office of Naval Research at Pt. Barrow are stated. Sections follow on the chemical and physical aspects of the area: climate, geology, ice, currents, salinity and other features of the sea; general biological aspects such as distribution, and abundance of animals, their food, reproduction, adaptation to cold, etc.; methods of collecting, stations and course of dredging. This rather general part is followed by a discussion of animals and phenomena according to phyla (p. 115-87), with data on morphology, occurrence, development and reproduction, ecology, taxonomy, etc. Short notes on some common fishes and mammals are included (p. 183-87). A discussion with synoptic and comparative tables concludes the account. (Arctic Biblio.)


Account of over 110 species and 11 varieties dredged in the course of two summers from depths of less than 225 feet, only six stations being over 400 feet deep. Of the material, 18 species and four varieties are new to arctic America. Synonyms, material examined, location, morphology, geographic distribution, variations, etc., are considered. An alphabetical list of species and genera and 27 plates with photographs are appended. (Arctic Biblio.)


Describes 108 species of prosobranch gastropods, chitons and scaphopods from the region between Hudson Strait, James Bay, Herschel Island, and northern Ellesmere Island. More than half of the species are circumarctic.

A generalized description of the physical and biological zones of the shore including the littoral zone. The area discussed extends from 70°29' to 74°05'N on the east Greenland shore.


Account of 20 species from material collected since 1926 in the Chukchi, Bering, Okhotsk and Japanese Seas. Synonyms, morphology, size, occurrence and geographical distribution are discussed. (Arctic Biblio.)


Description of bottom animal associations found in these areas, and based on sampling at 84 stations. The amount of biomass (weight of living matter per m³ of water) is calculated both in average and for select animal groups. The northern Bering Sea was found to be richer in bottom life, Chukchi Sea the poorer. (Arctic Biblio.)


Contains in the introduction (p. 1-44) a morphological sketch of decapod crustaceans, the so-called Anomura, with data on their biology, ecology, and phylogeny; a zoogeographic survey, and a note on their economic importance. (Paralithodes camtschatica, P. platypus, and P. brevipes, edible crabs); bibliography (95 items). In the special part (p. 45-289) are tables for the determination of superfamilies, families, subfamilies, genera and species; descriptions of 88 marine species and one subspecies with synonyms, dimensions and data on geographic distribution in Russian and extra-Russian waters. Many species native to Bering, Chukchi and Okhotsk Seas are included. Summary in English, p. 290-320. (Arctic Biblio.)

Makarov, V.V. 1941. Fauna Decapoda Beringova i Chukotskogo Morei. (The Decapod Fauna of the Bering and Chukchi Seas.) Issledovaniia Dal'nevostochnych Morei. 1:111-163.

Study, based on several collections, comprising 70 species of 24 genera. Following an introduction on earlier work, the individual species are recorded, with notes on location(s), depth, and geographic range. A general part (p. 144-57) deals with the character of the decapods of the two seas, distribution over particular areas, routes of spread, etc. From the character of its Decapoda, the Bering Sea is considered a boreal region. (Arctic Biblio.)

The developmental stages of *Chiridius armatus* are described and compared with the copepodite stages of *Bradyidius bradyi* and briefly with the naupliar stages of *Aetideus armatus*. The annual cycle is recorded for the two first-named species. The adult male of *Comantenna (=Bryaxis) brevicornis* is described for the first time. The copepodite development of *Xanthocalanus fallax* is described and an account is given of the annual cycle. The adult male of *X. minor* is redescribed and comparisons made between these two species. Consideration is given to the differences between the development and annual cycles here described and those of planktonic calanoids as possible indications of adaption to a benthic existence. Where necessary, nomenclature has been revised. (Author.)


Discusses procedures used in collecting benthic samples in the Chukchi and East Siberian Seas, and gives preliminary results by station.


While examining a specimen of the shrimp *Argis lar* from the Chukchi Sea, author noticed attached egg cases of snail, probably *Buccinum*. The capsules contained eggs and larvae of all stages of development and then are described and illustrated. (Arctic Biblio.)


Study of a great number of this crustacean from the Beaufort Sea. It was found to be most numerous on muddy bottoms where temperature ranged between -1.3 and +10°C; no specimens were found in depths greater than 24 fathoms. Sexual dimorphism, age and maturation are also considered. (Arctic Biblio.)


Reports an investigation in summers of 1958 and 1959 made in connection with king crab surveys. A check list is given of species of pelecypods, gastropods (except nudibranchs), barnacles, decapod crustaceans, tunicates and most echinoderms found on the continental shelf; some other invertebrates are also listed. Annotations to each species include areas of occurrence. Catches on stations are also analyzed as to their species composition. Approx. 140 references. (Arctic Biblio.)

A summer study off Point Barrow, Alaska found 23 species of diatoms in sea ice, in the brine between ice crystals on the underside of the ice. This find suggests that a considerable fraction of primary production takes place in sea ice. (Arctic Biblio.)


Gives a general outline of the fauna, mainly from depths of 1000-2000 m. He deals with the concept of the abyss, the arctic abyss and its topography, extent of benthos sampling in the arctic. Zoogeographic aspects are considered, generic and species distribution of the abyssal benthos in the Arctic are reviewed, with quantitative comparisons to the Antarctic. It is suggested that the polar abyssal benthos represents distinct regions of the world oceans. (Arctic Biblio.)


Lists stations with station data where these animals were found. Includes systematic and distributional data on each species.


A report on the Persei research vessel expedition of 1926 into the White and Barents Seas. (Arctic Biblio.)


Description of thirty-one (including one new) species, collected between 78°-84°N in Smith Sound, Kane Basin, Kennedy Channel. (Arctic Biblio.)


Several year's study of the seasonal dynamics of larvae of the benthic invertebrates in the plankton off the southern shore of Kandalaksha Bay
in the White Sea established that there is a relationship between the
temperature limits of spawning and the zoogeographical affiliation of
various littoral and upper sublittoral species. (Biological Abstracts.)


The distribution of pelagic larvae, juvenile and epitoquous stages of shallow shelf bottom invertebrates, in the plankton of the Norwegian and Barents Seas is largely determined by the distribution of the respective parental forms. The various currents influence the distribution only secondarily and to a rather limited extent. Most larvae remain in the water masses above the zones inhabited by their parents. Thus their large scale distribution in the plankton is determined primarily by the ecological and zoogeographical patterns of distribution of the parental life cycle stages. Such dependence of larval distributions on the distribution of adults in the benthos is assumed to represent a general pattern in all shallow regions of the world oceans. (Author.)


Contains description and drawings of *Spiochaetopterus typicus* larvae and a discussion of the significance of the adult in the benthos.


The breeding and larval development of *Asterias rubens* have been studied in the White, Barents and Norwegian Seas. A survey of the data on the breeding of local populations of the species from 17 regions in six European seas and in the English Channel indicates that the species contains three reproductive "physiological races," differing in the temperature at which spawning begins. Two, which begin spawning at 3.5-4.5°C and 6.5-9.0°C respectively, are true "physiological races" with temperature-conditioned reproduction, like the oysters *Ostrea edulis* and *Crassostrea virginica*, while the third, represented by the Kiel population which lives in brackish waters (*S* = 15‰) and which does not spawn until the temperature reaches 13-15°C, has arisen, not as a result of the temperature conditions prevailing in the region, but in response to its low salinity. The general ecological patterns of the spawning of *A. rubens* in European waters are analyzed. (Author.)

Seasonal and daily population dynamics have been studied in pelagic larvae of littoral and upper-sublittoral bottom invertebrates in the plankton of the shallow, narrow Velikaya Salma Sound, which connects the inner and outer areas of the Kandalaksha Bay in the western part of the White Sea. Hydrologically, this Sound is characterized by a clearly defined cycle of great seasonal variations in water temperature coupled with more or less stable salinities and regular, pronounced semi-diurnal tides corresponding to daily and lunar monthly tidal cycles. The seasonal dynamics of larvae in the Sound reflect differences in occurrence of spawning periods in local waters of various species and systematic groups of bottom invertebrates. These differences are caused by the correlation of spawning periods of local species of different zoogeographical origin with the different water temperatures. They reflect, also, lunar periodicities of spawning and larval hatchings. The daily dynamics of larval abundances are related to the daily spawning rhythms of many species with pelagic development affected by the daily tidal cycles of the Velikaya Salma Sound. A daily invasion of the Sound by pelagic larvae of bottom invertebrates from the inner and the outer parts of the Kandalaksha Bay occurs at ebb tide, and also at flood tide; the rhythms of the invasions coincide with the daily spawning rhythms of the Sound's invertebrates. From literature data summarized by MILEIKOVSKY (1958a, b, 1960a, b, c, 1961, 1965, 1968, 1970), it is concluded that seasonal, lunar and daily (tidal) reproductive periodicities for the marine shallow-shelf bottom invertebrates concerned, follow world-wide ecological patterns. It is evident that the effects of these rhythms upon the population dynamics of pelagic invertebrate larvae, as demonstrated by the present data on the Velikaya Salma Sound (White Sea), must also follow world-wide regularities. (Biological Abstracts.)


On the basis of literature data summarizing the field and experimental results mainly of 1940-60ies and of own material about the bottom invertebrates with pelagic development from Barents, White and Norwegian seas is discussed the problem of interrelations between the water temperature and breeding and spawning of marine shallow shelf bottom invertebrates.

The problem of dependence of breeding and spawning temperatures of individual species from their zoogeographical belonging is analyzed. Ecological rules of Appellof, Orton and Runnstrom and modern Korringa's conception of "physiological races" are discussed.

It is accepted that the main factor controlling the season patterns and periodicity of breeding and spawning of marine shallow shelf bottom invertebrates is the seasonal cycle of water temperature in the region of their inhabitance.

Character of dependence of breeding of individual species from water temperature is determined by their zoogeographical belonging.

Main regularities of interrelations between water temperature and breeding and spawning of marine shallow shelf bottom invertebrates are well outlined by solution of adding each other "Orton's rules" and modern conception of "physiological races." (Biological Abstracts.) In Russian.

Discussed the abundance of fish and haddock on the Murman coast in historical times, effect of the nature of bottom; the role of benthos in determining the abundance of haddock along the coast; biomass of the benthos in this area; seasonal changes in feeding habits of haddock. (Arctic Biblio.)


Author describes the occurrence of Propeamussium (Palliolum) vitreum Chemnitz, and Venus (Timoclea) ovata Pennant, and the morphology of their shells. Earlier records, warming of arctic waters, etc. are also discussed. (Arctic Biblio.)


Study based largely on field work conducted during 1953-1955, on the occurrence of the various benthonic invertebrates on different types of bottom (over 150 species and 5 main types of sea bottom); ecological aspects of the benthos studied; specific traits of coastal benthos, utilization of this benthos by the various cod-like fish, largely haddock and cod; distribution of species used as food. (Arctic Biblio.)


Account based on year-round collection during 1953-1955, combined with measurement of bottom temperatures. The distribution of 38 forms was established; both warm and cold-water forms were found, as well as such of wide distribution. Micro-areas in the zone studies were also established. (Arctic Biblio.)

Investigations confirm the opinion of K. Ockelmann (1958) concerning the absence of *T. flexuosa* (Montagu) in the seas of the extreme north. By this name, *T. equalis* (Verill et Bush) and *T. gouldii* (Philippi) are concealed in the fauna-lists of many authors. These species (perhaps polymorphous) and also *T. sarsi* (Philippi) and *T. ferruginosa* (Forbes) are widely distributed in the seas of the Arctic, while *T. flexuosa* is a boreal-lusithanian species. (Biological Abstracts.)


This report reviews the activities of 27 marine biological field collectors between November 1959 and May 1969. The collections include the most extensive American collections of central arctic plankton, rather limited but significant arctic bentonic collections, important Northeast Greenland planktonic and bentonic collections, and the most complete and largest collection of cyamids. Special attention has been directed to occurrence of organisms in particular water masses and to relations with confluent seas' populations. For these studies on protozoans, jellyfishes and some crustaceans are significant. State of work on cyclical events, behavior, physiology, and biochemistry, and of affiliated studies on cetaceans and on arctic marine-influenced lakes is reported. (Arctic Biblio.)


An historical discussion of marine biological work carried out at the Naval Arctic Research Laboratory, Barrow, Alaska.


The abundance of life in the Arctic ranges from considerable in favored areas of the continental shelf to negligible at the bottoms of deep basins. Even at the surface in the central Arctic Basin life is reduced to a few kinds and not many individuals except sporadically. There are periodic reminders, such as the occurrence of the octopus in the hydrohole, animals the nets never take, and perhaps more significantly, the whole composition of the high Arctic polychaete fauna, that collection so far is incomplete and probably very incomplete for animals that can avoid catching devices. (Author.)

Contents: Some problems of estimating biological resources of the oceans in the light of the results of the Bering Sea expedition; principal results of latest investigations of bottom relief and sediments in fishing grounds in the North Pacific Ocean; bottom relief and sediments and some features of the geological structure of the continental slope in the Eastern Bering Sea; distribution of bottom areas in the Bering Sea suitable for trawling; mineral composition of the coarse silt fraction of recent sediments in the northwestern part of the Gulf of Alaska; some hydrological characteristics of whale grounds in the Northeastern Pacific and the Bering and Chukchi Seas; seasonal variations in primary production in the southeastern part of the Bering Sea; plankton of the eastern Bering Sea in spring and autumn; winter and spring plankton in the southeastern part of the Bering Sea; quantitative distribution of benthos on the continental slope of the eastern part of the Bering Sea; distribution of the deep-sea prawn (Pandanus borealis) in the Bering Sea and Gulf of Alaska; some data on the distribution of King Crab (Paralithodes camtschatica) in the southeastern Bering Sea; an estimation of the state of the King Crab (Paralithodes camtschatica) stock in the southeastern Bering Sea. (NTIS.)


Syllis quaternaria and Ammotrypane brevis are described from the morphological point of view. Specimens of the former were taken by E.A. McIlhenny off Point Barrow, and a single example of the latter by Dr. Benjamin Sharp at Icy Cape, Northern Alaska. (Arctic Biblio.)


Reports finds of tubes, a few with the animals in them, of these peculiar invertebrates in the southwestern part of this sea. The finds are identified as belonging to the genus Diplobrachia. (Arctic Biblio.)


Oceanographic conditions in Smith Sound, northern Baffin Bay, Disko Bay and southeastern Baffin Bay during the summer of 1968 are described. Vertical sections of temperature and salinity are presented and the relationship of these variables to Baffin Bay-North Water and the general circulation of Baffin Bay is discussed. Zooplankton collections in the Smith Sound region and macrobenthos collections in Disko Bay and several West Greenland Fjords are reported on. Listings of the physical and chemical station data are included. (Author.)

**Muller, G.W. 1933. Die Ostracoden des Arktischen Gebietes. Fauna Arctica 6:21-32. Lists arctic members of this group with locations.**


Summarized operations at six collecting localities (Cape Smythe Beach, Elson Lagoon, waters off Cape Smythe, off Franklin Point, off Port Clarence, and head of Norton Sound), listing the species of invertebrates collected, and comparing the abundance of individuals, at each locality. (Arctic Biblio.)


Descriptions based on specimens collected from waters off Point Barrow and Point Franklin, 1883, during the First International Polar Year Expedition to Point Barrow. (Arctic Biblio.)


Systematic annotated list with synonymy, citations, and localities of 180 species some of which are described. Obtained from tundra pools (four species of crustaceans) and beach near Point Barrow, Point Franklin, Port Clarence, in Norton Sound, Gulf of Alaska, and Plover Bay (Siberia). Includes comments on coelenterates by J. Walker Fewkes. Bibliography (about 100 items). (Arctic Biblio.)


Of eight species of the phylum Priapulida, each of three pairs is symmetrically distributed in the Arctic and Antarctic, and closely related. This bipolar distribution is assumed to have taken place via the cold abyssal waters of the tropics. The assumption is supported by the fact that a subspecies of the bipolar forms and the other two species of these marine worms have an abyssal, tropic-subtropic distribution. (Arctic Biblio.)

Describes 91 specimens belonging to 12 species of these interesting worms, collected by different expeditions during 1947-1958 from depths of about 1000-6800 m. Two species, G. tasmaniensis and G. vitjazi n. sp. are treated in some detail. Age, sexual, ecological and geographic aspects are considered. Most of the species are arctic, antarctic or bipolar. (Arctic Biblio.)


Discusses and illustrates the prevalent invertebrates in each environmental situation. Covers intertidal to deep-sea forms.

A comprehensive study of the invertebrates covering 26 families with 333 species. Its general part (p. 19-164) deals with the morphology and anatomy, development and life cycles, organismal integration within the colonies, phylogeny and origin, taxonomy, and geographic distribution. In the special part (p. 165-571) are keys and descriptions of taxa, the latter including information on synonyms, anatomy, distribution, etc. The majority of forms dealt with are arctic or subarctic. Plates (30) contain photographic reproductions, some in color. A scientific, alphabetic index is included. (Arctic Biblio.)


The new species *Cytheropteron arcticum* and *C. nodosoalatum* which are considered to be recent species characteristic of cold marine waters are diagnosed and described. The new species *C. dimlingtonensis* which is only known from the Pliostocene Bridlington Crag of England and from en- glacial material from the Aaratsmarkbreen glacier of Spitzbergen is also diagnosed and described. (Author.)


In August-September benthos sampling on the shelf on the upper portion of the slope was carried out in the eastern part of the Bering Sea. Altogether, 104 dredge stations were occupied at depths from 20 to 500 m. The mean benthos biomass in this region makes up 74.4g/sq. m, the main part consisting of bivalves and echinoderms. Qualitatively, the benthos of the investigated area can be divided into two complexes; low-arctic and boreal ones. Low-arctic complex achieves its greatest development in the northwestern part of the area investigated where it stretches from the shore to the isobath of 100 m, while in the southeastern part it is situated in the narrow band at the depth of 50 to 70 m. The remaining area of the shelf and upper horizons of the slope are occupied by boreal fauna. Low-arctic complex is characterized by *Macoma calcarea* and *Ophiura sarsi*, while the boreal one is characterized by *Echinarchnius parma* and *Yoldia traciaeformis*. (Author.)

Contains information on the currents of this area; effect of the warming up of the arctic waters; collections (1955-59) of bottom animals made by author, etc. Warm-water (boreal) forms were found in deeper waters along the west coast and were predominant in its southern part. Shallow water forms were exclusively arctic. (Arctic Biblio.)


Reports on the benthos of a small (6.2 km³), representative area as studied before the war and in 1957-58. Temperature, salinity, geographic origin of forms, benthic complexes (three), and their limits are noted in a general way. (Arctic Biblio.)


Contains a description of currents in the northern and arctic Atlantic followed by records of corals and sea pens collected in these areas by PINRO expeditions during 1954-1960. Depth and distribution of the finds are noted. An attempt is made to correlate the detailed distribution of these benthonic forms with the ambient water temperature, dependent in their turn on the water masses, their distribution and movements. (Arctic Biblio.)


Analyzes the trophic structure of a generalized marine benthic biocoenosis.


Detailed descriptions of five new species of marine mites, four from Aleutian waters, and one from north of Wainwright in Northern Alaska (with redescription of a California species); a study made possible through aid of the Arctic Institute of North America. (Arctic Biblio.)

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Describes ten new species and one new subspecies of water mites and adds two new records for Alaskan waters, bringing the total discussed for the region to 27 species. Offers a table of principal specific characters to the genus *Copidognathus*, and a formula key to known species from the Arctic Ocean, Bering Sea, and the adjacent North Pacific. (Arctic Biblio.)


Contains a comparative analysis of several collections of these molluscs from circumpolar regions, viz. that of Dr. McGinitie from Point Barrow region, and those reported by Dr. Soot-Ryan, also some from Florida. The author concludes that the main component of this arctic fauna consists of ancient, primitive forms. A second, much smaller component is represented by "the more specialized burrowers." (Arctic Biblio.)


Reviews temperature distribution in 1963 as compared with two preceeding years, plankton, quantity and quality, benthos and redfish. (Arctic Biblio.)


Twelve species of Enchytraeidae were recorded from terrestrial, littoral and benthic habitats during the summer 1970. Two new species, *Cernosvitoviella pusilla* sp. n. and descriptions of *Lumbricillus charae* (Tynen) 1970 and *Henlea ochracea* (Eisen) 1878 augm. Welch 1919 are augmented. (Author.)

Contains a critical revision of Norwegian species of the Molluscan order Solenogastres, based on the study of collections in the museums of Bergen, Copenhagen, Gothenburg, Kristiania and Trondhjem, with a synopsis of all the forms treated in this paper and a descriptive section, (p. 10-54) dealing with systematics, morphology and distribution of each of 12 Norwegian species, including five native to Greenland Sea and the Arctic Ocean. A comparative section contains general consideration of the organization and the relations of the Soleogastres, a bibliography (38 items). (Arctic Biblio.)


Contents: Natural arctic ecosystems with ice stress; emerging new systems associated with man; migrating subsystems. (NTIS.)


Contains a systematic list of about 400 amphipods, of which two genera and 14 species are described as new. The data include localities, references to expeditions (chiefly Swedish), temperature, depths, ground frequency, etc. The range of the study includes practically all arctic seas of Eurasia and America. (Arctic Biblio.)


List, with notes on locations and distribution of fifty-eight species, of which fifty-one are from waters between Bering Strait and Bernard Harbor, N.W.T., and seven from Hudson Bay area. (Arctic Biblio.)


Contains brief discussion based on the literature and on study by the author of 113 species from Pt. Barrow, northern Alaska. All but 11 of the species were already known from the Greenland to the Kara Sea region. Author concludes that there is no significant difference between bryozoa of the Pacific-Arctic and Atlantic-Arctic areas and that a preponderance
of circumpolar species exists in the Arctic Ocean. Table shows distribution of the 113 species from Alaska south along the Pacific Coast, Greenland south along the Atlantic Coast, and in northern Europe. (Arctic Biblio.)


Briefly enumerates isopods collected from Fletcher's Ice Island T-3 in the area from 84°13.5'N to 86°00'N and from 86°51'W to 121°05'W. Also describes and illustrates Mirabilicoxa fletcheri n. sp.


The investigation is an analyses of seventy-five quantitative benthic samples collected by the Mini-LUBS, twenty-eight qualitative benthic samples collected with the Small Biological Trawl, and fifty-two bottom camera stations taken from Fletcher's Ice Island, T-3, while it was drifting over the Alpha Cordillera region of the High Arctic Ocean during October 1969 through February 1970 and in March 1972. The depth range was 1000 to 2500 m. Benthic foraminiferans are responsible for about 53 percent, bivalves for 27 percent, sponges for 7 percent, and polychaetes for 5 percent of the total biomass. Other groups make up the remaining 8 percent. In numbers, excluding Foraminifera, polychaetes are 42 percent, nematodes 16 percent, sponges 11 percent, and bivalves 8 percent of the total fauna. The remaining 23 percent is composed of thirteen other taxa. (Modified author abstract.) Portions of this document are not fully legible. (NTIS.)


An analysis is made of 75 quantitative benthic samples collected by Mini-LUBS, and 28 qualitative benthic samples collected with the "small biological trawl." from Fletcher's Ice Island, T-3, while it was drifting over the Alpha Cordillera region of the High Arctic Ocean during October, 1969 through February, 1970 and in March, 1972. (Author.)


Contains a brief historical outline of the study of the fauna of far eastern seas. The atlas covers the most common and characteristic invertebrate forms of the far eastern seas of the USSR extending from the Korean Coast to the Bering Strait. Includes 66 plates. (Arctic Biblio.)
A study of the bottom fauna from a 20 mile wide zone and 147 samples: distribution according to species or larger taxa, quantitative distribution of the larger groups, distribution per haul, frequency of individual species, zoogeographic origin of forms: circumpolar (47%), North Atlantic (and North Pacific) 16%, Arctic (8%), and of dubious origin 27%. The role of currents, especially those from the Atlantic in the distribution of the local benthos, is discussed. (Arctic Biblio.)


On a reexamination of polychaete worms collected from Alaska in 1924 by R.A. Bartlett, identifications are shown to be incorrect as published in A.L. Treadwell's Polychaetous annelids collected by Captain R.A. Bartlett (etc.) 1926. Gattyana treadwelli is now described as a new species. (Arctic Biblio.)


Description of *Eunoe clarki*, n. sp. from two specimens of this annelid worm which were washed ashore at Point Barrow, Oct. 1949. (Arctic Biblio.)


Contains a study of material collected during 1948-50 by G.E. MacGinitie of the Arctic Research Laboratory. Eighty-eight species and 26 families are described with notes on synonymy, keys to families, genera and species, geographic distribution, frequency, etc. Some limited material from earlier collections was also utilized in this monograph. (Arctic Biblio.)


Contains a study of the arcto-boreal elements in the plankton, benthos and fish fauna in the northern section of the Kara Sea; some species are noted and their distribution is given. The penetration of some species from Barents Sea is explained by the warming-up of the climate of the Arctic. (Arctic Biblio.)

Popular survey of the main resources of the Soviet Seas; algae, crabs, fishes, whales, seals, birds, stressing the richness of arctic marine flora and fauna. (Arctic Biblio.)


Reports studies of SCUBA divers during 57 days in 1960 with observations from other sources. Year-old crabs (3-12 mm carapace length) live solitarily in niches of the littoral; 9-19 mm crabs are found on dock pilings; two-year olds (24-69 mm c.l.) form aggregations (pods) which persist throughout the third and part of the fourth year. These pods subsequently change into elongate piles and, at 60-97 mm c.l., into dome-shaped aggregations. (Arctic Biblio.)


Ninety-three species of Bryozoa are reported here from the area of arctic Canada extending from Belle Isle Strait westward to Herschel Island. Bathymetric and distributional data, both local and regional, are given for all species. Photomicrographs are provided for 47 species. One species, Stomatocellaria hincksi, is described as new. Electra crustulenta (Pallas) var. arctica Borg is accorded specific rank. Callopora smitti Kluge is referred to the genus Copidozoon and Hippodiplosia obesa (Waters) is transferred to the genus Schizoporella. A new family, Hincksiporidae, monotypical for H. spinulifera (Hincks), is attributed to the Ascophora Imperfecta. Porella princeps (Norman, 1903b) is considered to be a synonym of Pachyeglis producta (Packard, 1863), and Codonellina operculata Mawatari (1956) a synonym of Schizomavella porifera (Smitt, 1867). The following eight species are new for arctic Canada: Terminoflustra barleei, Scrupocellaria arctica, Reginella spitzbergensis, Hippoporina cancellata, Schismopora nodulosa, Escharella thompsoni, Smittina mucronata, Pseudoflustra sinuosa. Except for R. Spitzbergensis and H. cancellata, these are also new for arctic North America.

The zoogeographical relationships of the fauna are discussed, three main types of distribution being recognized, viz., panarctic, boreal-panarctic, and Atlantic-arctic. No relationship between faunal distribution and the surface waters of the arctic and subarctic zones is apparent, the majority of species transgressing both. Compared with the bryozoan fauna of the antarctic region, the arctic group is impoverished in indigenous taxa (Author.)

Author gives a quantitative qualitative analysis of the fauna of soft bottoms of the small inlet (Oscar Bay) on which the Murmansk Biological Station is located. (Arctic Biblio.)


The findings of underwater investigations carried out in the Murman sublittoral of the Barents Sea are outlined. The applications and advantages of various types of diving suits for summer and winter seasons are pointed out. Also the use of still and motion picture cameras and the significance of the photographs in determining the littoral fauna and flora and their migrations are discussed. The investigations disclose the presence in the littoral of many warm-water species that have been brought by the Nordkapp current. (Author.)

Fifty-two new marine species and three subspecies are described, among them about thirty native to Bering Sea, Aleutian Islands and the Gulf of Alaska. (Arctic Biblio.)


List, with locations and distribution of 21 species of shrimps and crabs from the coastal waters of Alaska and Northwest Territories, with additional records by other Canadian expeditions, and a bibliography. (Arctic Biblio.)


Records 67 species, mainly from offshore waters with two new forms Magelona alata n. sp. and Euchone trisegmentata n. sp. described in detail. Records include synonyms, location(s) of find, nature of bottom, etc. (Arctic Biblio.)


Lists arctic members of these groups with locations.


The mollusc was observed for the first time at the end of May, 1960 at a water temperature of 6-8°C. By the middle of July, when the temperature was 14-16°, it became the dominant nudibranch in this area. A description of the new sp. is given and it is differentiated from the related spp., C. postulata and C. concinna. (Biological Abstracts.)

Comprehensive study of this common barnacle made in 1957-1959 along the southern shores of Kandalaksha Bay. Age composition on different shore formations and mortality at Cape Kartesh due to influx of fresh water are described. Growth and reproduction are considered. (Arctic Biblio.)


Reports on material collected during Sept. 1957-Dec. 1959, also 1953-1955 at the entrance to Chupa Bay, in the bay proper and in adjacent areas of Kandalaksha Bay. Eleven crustaceans, 19 molluscs and two echinoderms are recorded as to depth of occurrence, biotope, size and age limits, reproduction and embryonic development, hatching, etc. (Arctic Biblio.)


Contains a list, with synonymy, some descriptions, localities and notes of twenty-four species (coelenterates, echinoderms, annelid worms, crustaceans, and tunicates) from Baffin Bay and the waters of the Canadian Arctic Islands. (Arctic Biblio.)


Account of invertebrate collections and research in the 19th century; work in present century till 1940 (mostly descriptive and taxonomic); research centers in Alaska; recent and current investigation in entomology, parasitology, terrestrial and marine invertebrates; main research problems. (Arctic Biblio.)


All individuals of the Caudofoveata (formerly Aplacophora-Chaetodermatida), hitherto authentically recorded from Norwegian waters, are listed geographically. Additional comments are given on their systematics and on the horizontal as well as vertical distribution. (Author.)


Contains a systematic list of 32 species of so-called "arctic outliers" (arthropods, molluscs, worms and echinoderms) in the fauna of Christianiafjord, with data on their distribution in their native arctic regions and the discussion of the reasons of their occurrence in the northern part of Norway. (Arctic Biblio.)


Progress report on field work at Point Barrow, noting personnel, methods used, preparation and character of profiles, conditions of tides, beach and bottom, ice, and weather. Storms and subsequent changes in near-shore bottom conditions are described, and explained. (Arctic Biblio.)

List of three mysids (including one new species fully described) and three euphausids, showing station where taken in coastal waters and lagoons of Alaska and Northwest Territories. (Arctic Biblio.)


The bibliography contains 152 citations to research and conference reports written in English and published between 1970 through mid-1973 concerning environmental problems to be encountered in the construction of the trans-Alaska pipeline. The emphasis is primarily on Alaska marine and terrestrial environment, although a number of items deal with engineering problems related to the Arctic environment. The citations are arranged under ten broad subject categories and an author index is provided. (NTIS.)


Notes on the morphology of these vermiform coelomates, taxonomy, occurrence in depth, and distribution, which includes the Chukchi Sea as far east as Point Barrow and Glacier Bay, Alaska. (Arctic Biblio.)


Following a brief characterization of this bay on the Murmansk coast (69°05'-69°09'N, 36°00'-36°05'E). Another gives some analysis of the deep-water animal groups living near the shores. (Arctic Biblio.)


List of species collected during the voyage of the ice-breaker *Sibiriakov* and *Rusanov*, 1932 in Kara and Chukchi Seas, with locations and discussion. Summary in German. (Arctic Biblio.)


In the northern troughs, Atlantic, Greenland and boreal deep-sea forms were found. The southeast region was an original fauna including brackish forms indicating a possible influence of the Ob-Yenisey waters. There are also indications that Atlantic waters penetrate by way of the polar basin. Based on material collected by ice breakers in 1929-34 and by *Sadko* 1935-36 in Kara Sea, also in parts of Greenland and Barents Seas and the Arctic Basin. (Arctic Biblio.)

Full description of a new species found in the Kara Sea, Greenland Sea, and in the Arctic Basin. (Arctic Biblio.)


A description of twelve new species and varieties taken mostly during the voyages of the ice-breaker Sadko, 1935 and 1937-38. Summary in English. (Arctic Biblio.)


Contains a morphological and biological sketch of marine forminifera of northern seas of the USSR with keys for determination of the families, genera and typical species of this order. (Arctic Biblio.)


On the basis of the study of several collections of foraminifera from the arctic seas, the author divides this fauna into the following groups: (1) deep-sea group (1000-3800 m); (2) sublittoral coldwater group (80-200 m); (3) sublittoral warm-water group; (4) upper sublittoral group (0-80 m). Oceanographic conditions and typical species for each group are discussed and compared with similar groups of the North Pacific Ocean. (Arctic Biblio.)


Descriptions of Rhabdammina parabyscorum n. sp. (southern Okhotsk and Bering Seas), R. pulverulenta n. sp. (southern part of Barents Sea) and R. heteractina n. sp. (Okhotsk Sea). (Arctic Biblio.)

Contains a study of the geographic variation of a foraminifer, *Thabdammina abyssorum*, together with descriptions of *R. a. abyssorum* (Greenland Sea and arctic seas), *R. a. arctica* n. subsp. (arctic seas and Svalbard waters), and *R. a. pacifica* n. subsp. (northern Okhotsk Sea and Bering Sea). (Arctic Biblio.)


Contains a list of 57 foraminifers (tables 1-2) with their vertical distribution. The material was obtained in 1949 by the Expedition of the Institute of Oceanology of the Academy of Sciences USSR in the southern part of the Okhotsk Sea from the bottom sediments at the depth of 3400 m. Analysis of the samples shows that the foram bottom fauna is almost identical with benthic fauna of corresponding regions of the Okhotsk Sea, and that the typical fossil forms are lacking. (Arctic Biblio.)


Account based on study of extensive collections made during 20-25 years. The fauna is divided into climatic and geographic forms and such of the deep sea. The main factor determining distribution in one and the same area was found to be depth, at equal depths: temperature, salinity, and currents. (Arctic Biblio.)


Comprehensive review, citing number of identified species for each sea, and outlining species variation in respect to depth, temperature, salinity and hydrographic conditions. Seven groups are distinguished according to ecologic conditions, and are characterized. Over-all results of foraminifera study in the Arctic Ocean are summarized. An extensive review is made of the literature for which a reference list is appended. (Arctic Biblio.)


Contains descriptions of three new species and one new variety of sea spiders, including *Nymphon hogdsoni* n. sp. native to Okhotsk Sea and *N. longitarse* var. *minus* n. var. occurring in Okhotsk and the arctic seas. (Arctic Biblio.)

Contains in v. 1, an introduction (cxiv p.) giving terminology; doubtful genera, with descriptions of 14 new species; characteristics of Pantopoda; bibliography (317 items). Then follows (p. 1-224) a monographic treatment of eight families (Pycnogonidae-Phoxichilidiidae), with keys, Latin diagnoses, Russian descriptions, synonyms, critical notes, lists of specimens, and data on geographic distribution. In v. 2 (p. 225-554) the families Pallenidae and Nymphonidae are treated similarly; a supplementary bibliography compiled by D. Redotov (84 items) and an index of Latin names are appended. Many species native to Russian arctic waters are included, also some from other northern seas because they are important for the study of Russian species. (Arctic Biblio.)


List, with notes on synonymy and distribution of fifty-three (including one new) species of marine and fresh water forms from the arctic coast, collected by the Expedition; with data from the Neptune collections, and a bibliography. (Arctic Biblio.)


Lists amphipods collected in the Barrow region with locations, references, and some descriptions and illustrations.


List with references to literature, remarks on specimens, some descriptions, occurrence and distribution, of ten (including one new) species of crustaceans, decapods and mysids; bibliography (36 items). (Arctic Biblio.)


Discussed the zoogeographic origin of the bivalves of these seas; the arctic-boreal forms and others; endemic arctic and other species; conditions in the Okhotsk Sea, and in the northernmost Kuril Islands. (Arctic Biblio.)


Reports on 1962-63 investigations in this western arm of Kandalaksha Bay, with supporting data on area and depth, temperature, salinity, pH and O₂. Seventy-three species of invertebrates are recorded. Due to the almost complete isolation of this inlet from the sea, a retreat of marine forms and appearance of freshwater elements is noted. (Arctic Biblio.)


List, with descriptions, synonymy, localities and notes, of thirty-four (including one new) species from Kane Basin and Kennedy Channel. (Arctic Biblio.)


Descriptions of the Oligochaetes collected in Arctic regions of North America with a discussion of distribution and systematic relationships.


Contains a systematic index of water mites of the superfamily Halacarae, followed by an introduction (p. 9-44) giving characteristics, brief history of the development, biological and ecological sketch, history of the study, present-day knowledge and geographic distribution, and a bibliography (147 items). In the special part (p. 45-196) are keys to the sub-families, genera, subgenera and species; descriptions of 91 species and 23 varieties (17 species and four varieties described as new), of which 46 species (38 marine and eight freshwater) are native to the USSR; synonyms, critical notes as well as data on metamorphosis, biology, ecology and geographic distribution are included. Index of Latin names is appended. Many species are native to northern waters of the USSR and adjoining countries. (Arctic Biblio.)


Ecological study based on the molluscs and better known echinoderms with detailed notes on associations, distribution, size and abundance, brief characterization of the fiord (about 69°35'N, 19°15'E) and mention of its other fauna. Charts: bathymetric and bottom sediment charts. (Arctic Biblio.)

Contains a list, with localities and depths, of thirty-six species of molluscs and one brachiopod, based on collections made by the Blaafield in 1923 from the coastal banks west of West Spitzbergen. (Arctic Biblio.)


Contains the result of hydrographical survey of Ramfiord, Tromso district, carried out by the author in 1924, with data on isotherms, isophalines and isopycnes, bottom fauna and plankton; hydrographical tables, p. 15-21. (Arctic Biblio.)


List, with references to literature, localities, remarks and distribution, of twenty-one (including two new) species of pelecypods (clams, oysters, mussels) from the Chukchi and East Siberian Seas. Discussion, with table, of distribution and occurrence in the north Siberian seas and of migrations of arctic pelecypods in Tertiary times resulting from alterations of physical conditions; bibliography (74 items). (Arctic Biblio.)


A systematic list of thirty-five bivalve species reported by expeditions prior to, and including the Norwegian Scientific Expedition, 1930; with notes on the hydrographic conditions of the waters surrounding Franz Josef Land and remarks on research needed to establish the effects of temperature on distribution of pelecypods. (Arctic Biblio.)


Contains a study of systematics and distribution of northern molluscs in the collection of the Tromso Museum, including a key to eight families of the order Anomalodesmacea, and an enumeration of twelve marine species, including some fossils, with descriptions (Thracia rectangularis n. sp.), brief synonymy, measurements, types, type localities and critical notes; a list of material including an enumeration of specimens, arranged by the species and regions; the principal area of distribution is limited on the south by Great Britain, The Faroes, Iceland, Cape Farewell, Greenland, and to the east and north by Novaya Zemlya and the Arctic Ocean; the total distribution for each species is also given. (Arctic Biblio.)

Includes a description of Alcyonidium enteromorpha n. sp., collected by G.E. MacGinitie of the Arctic Research Laboratory, off Point Barrow, Alaska. (Arctic Biblio.)


A Pacific-boreal species, Chthamalus dalli occurs in the narrow intertidal zone near Cape Thompson, Alaska. Diatoms and filamentous green algae, but no other animals, were associated with the barnacles which apparently survive the winter frozen in the ice foot. Growth is less than in southern species, but continued for five years or more; maturity is reached in two years and breeding can occur at a water temperature of 6°C. There appears to be only a very slight cold adaptation, shown by cirral activity, compared with C. dalli from southeast Alaska and southern California. (Arctic Biblio.)


Describes two incomplete specimens, male and female, of Galathealinum arcticum n sp. from Thetis Bay, Herschel Island, at a depth of 120 ft. (Arctic Biblio.)


Lists 201 species from 11 phyla obtained during a marine survey in 1959, and discussed the general distributions of the main groups of organisms in relation to their habitat. Samplings were made on a pre-plotted 20-mile interval grid from MV John N. Cobb. Echinoderms, tunicates, decapods, molluscs, and annelids were the dominant faunal elements encountered and account for approximately 95% of the sampled biomass. The fauna is Pacific boreal in character since the prevailing northtrending current prevents high arctic species from entering the Chukchi Sea and the shallowness of this area eliminates any deep-sea elements. Relatively large areas of littoral zone are sparsely populated owing to scouring of the inshore area by ice. The standing crop of the area studied is considered to be high partly because of the low fish population. (Arctic Biblio.)

Contains result of study of a large collection of hydroids from southwestern Barents Sea particularly Kola Bay. 70 species are listed, some 22 are new for the area and largely warm-water forms. Three new species are reported and described. Bibliography (29 items). Summary in German. (Arctic Biblio.)


Comparisons of the type specimens of the hermit crab Pagurus kroyeri from Greenland and P. pubescens, showed them to be identical. The American species thought to be pubescens is now given the name P. arcautus. Both species are compared with P. tigonocheirus using a new diagnostic character. (Arctic Biblio.)


Five surveys of the Queen Elizabeth and nearby islands during the summer of 1962 collected 1221 specimens of decapod Crustacea. These decapods comprised 10 species of hippolytid and crangonid shrimps. Sizes and maturity status of specimens indicated variability in adaptation of different species to the low temperature environment. Records of northern distribution of the species in Canada and Greenland are reviewed. Food was mostly detritus and phytobenthos but some species showed preference for foraminiferans or crustaceans. (Author.)


The CGS Salvelinus collections of decapod crustaceans from the South Beaufort Sea to Cambridge Bay in 1960-65 comprised 1830 specimens of 15 species. Five of the species were not previously recorded from this area. Most abundant species were Sabinea septemcarinata and Eualus gaimardi. Eualus macilentus and E. stoneyi were confined to Bathurst Inlet. Westward setting currents along the Beaufort Sea coast mediate against incursions by Pacific species but Chionoecetes opilio, Hyas coarctatus alutaceus, and a species of Pagurus seemed to have overcome this condition. The species in which the highest percentages of females presumably reproduced annually were Spirontocaris phippsi, S. spinus, and S. septemcarinata. (Author.)


Contains a list of 81 stations established (as part of the Arctic Ocean Hydrographic Expedition) by the Taimyr in 1913 in Japan, Okhotsk and
Bering Seas and in the arctic seas from Bering Strait to the Taymyr Peninsula of Siberia, with the following data for each station; date, time, location, air and sea temperature, bottom, brief list of marine and terrestrial (island and coastal) fauna. (Arctic Biblio.)


Describes *Anonyx bispinosus* n. sp. on the basis of British Museum material collected off the east coast of Kolguyev Island, Barents Sea. (Arctic Biblio.)


Studies this circumpolar crustacean from arctic areas and the Gulf of St. Lawrence. It was found to be protandrous, to reproduce throughout the year, each female having more than one brood. Graphs, tables, illustrated, references. (Arctic Biblio.)


In place of the widely ranging, abundant, and variable species *Anonyx nugax*, previously recorded from Canadian Atlantic and Arctic waters, eight less variable species of this genus are here recognized, one of which (*sarsi*) is new to science. Detailed descriptions, figures, distribution maps and a key applying to all sizes is given. The study of the species is based on examination of available type-specimens and the use of new characters. The systematics of the genus is discussed in a chronological review of all the relevant literature, and the status of several species is revised. (Author.)


Lists specimens of *Anonyx nugax*, *A. pacificus*, *A. sarsi*, *A. laticoxae*, *A. lilljeborgi*, *A. ochoticus* and *A debruyni*, examined in 15 Canadian, west European and/or American museums. Position and depth of the station, date and collector (expedition, ship or individual) are stated, as is the museum where specimen(s) may be found. In addition to collections from the entire Canadian coastline, a few are included from Alaskan waters, Sea of Okhotsk, Greenland and Svalbard waters, and the Barents and Kara Seas. (Arctic Biblio.)

A collection of 127 echinoderms was made from the ice island Arlis II as it drifted southward along the east coast of Greenland. Sixteen species are represented: 2 crinoids, 4 asteroids, 8 ophiuroids, 1 echinoid, and 1 holothurian. Distributions of the animals are discussed in relation to their occurrence in Greenland and adjacent waters. Of the species collected 14 are characteristic of the east Greenland marine fauna; two are characteristic of the northern North Atlantic and are not commonly found in east Greenland coastal waters, and two have been recorded from both regions. (Author.)


Lists arctic tanaids and amphipods with locations.


Results of growth experiments in the laboratory indicate there are two distinct reproductive periods annually and that growth patterns for the first two years differ for the two spawning groups.


Contains discussion of the effect of the North Cape current on the rise of the temperature in Kola Inlet. Author analyzes a number of animal species (corals, echinoderms, polychaetes) known to have been rare or confined to deep waters earlier, and attributes their present abundance to this rise in temperature. The change is largely toward an enrichment with boreal elements. Bibliography (about 50 items). Summary in German. (Arctic Biblio.)


List of bottom animals collected by trawl in 1926-27. About 40 species are described including five fishes. (Arctic Biblio.)


Contains notes and data on origin and habitat of some species new to this arm of the Barents Sea (Murman coast). Molluscs and hydroids are included. (Arctic Biblio.)


Contains a review of the present-day knowledge of the littoral fauna of East Greenland, with a general description, notes on some typical species and ecological subdivisions, based chiefly on works of H. Madsen, H. Brich, and some other zoologists; the littoral fauna of West Greenland (53° N-67° N) is briefly discussed. (Arctic Biblio.)


After introductory sections on the scope of biology in this expedition, on equipment and the laboratory, an outline is presented of this part of East Greenland and its bio-geographical peculiarities. Terrestrial and marine mammals encountered are described (particularly musk ox and seal), with native names, data on occurrence, hunt, economic value, etc. A relatively large section deals with birds (34 species) and is followed by
chapters on marine biology (temperature, salinity, pH, etc.: common phyto-
and zooplankton, invertebrates, fishes and seaweeds), also terrestrial
invertebrates and flora. The concluding chapter (p. 51-67) deals with
physical anthropology of the "Eskimo race;" blood groups of pure and mixed
populations; origin, racial and geographic, etc. (Arctic Biblio.)


Describes, with illustrations, each of eight species of sponges collected
during the Fourth Pearcy Land Expedition in 1966.

Theisen, B.F. 1973. The Growth of Mytilus edulis L. (Bivalvia) from Disko and

The growth in length of Mytilus edulis L. from Disko and the Thule dis-
trict is estimated by means of the very distinct winter growth checks.
The growth is highly sigmoid and can be described by a combination of the
Gompertz equation (valid for growth until about half the ultimate length is
attained) and the von Bertalanffy equation (valid for growth from about
one third of the ultimate length) as neither of the two growth equations
covers the whole size range of Mytilus. The growth of the species at Green-
land is slow compared with its growth in most temperate areas. Doubtlessly
low temperature is the cause of the slow growth. When the growth rate is
related to day-degrees, growth at Greenland almost equals that found in
similar habitats in temperate regions. An apparent size-dependent mortality
occurs among the very small Mytilus living on Fucus. However, this pheno-
menon is probably caused by differential emigration among the small indivi-
duals. A conspicuous lack of young individuals in the samples from the
Thule district indicates that practically no settling took place after 1959
in that area. (Author.)

Theroux, R.B. 1971. Major Taxonomic Groups of Macrobenthos in Disko Bay and
Several West Greenland Fjords. United States Coast Guard Oceanographic Report
No. 37. p. 34-40.

A preliminary report on the macrobenthic organisms collected by the USCGC
Eastwind in 1968. Station locations are listed with physical features of
the bottom and major groups or organisms collected are listed by station.

Fauna Arctica 5:561-632.

Lists arctic members of these groups with locations.

Lists arctic solenogastres with locations.


Descriptions of the egg capsules and development of twenty-eight species of marine snails, collected by the Danish Three-year Expedition in the Franz Joseph and Scoresby Sound Fiord areas of East Greenland. (Arctic Biblio.)


Discussion (based on material collected in East Greenland 68°10'-76°50'N by the Danish Three-year Expedition, 1931-1934) of the reproduction, spawning time and larval development of arctic echinoderms, polychaetous worms, gastropods, lamellibranchiates, crustaceans and other marine invertebrates; growth, consumption of oxygen; summary of the ecology and common biological features of arctic invertebrates, comparison with those of other seas; bibliography (about 150 items.) (Arctic Biblio.)


The impoverished fauna (56 species) resulting from subnormal marine conditions on the shallow shelf beneath the Laptev, East Siberian and Chukchi Seas is recorded with notes on its distribution which appears to be haphazard for most species. (Arctic Biblio.)


The ascidians of the Canadian Arctic collected by the Eastern Arctic Investigations and Arctic Unit of the Fisheries Research Board of Canada from the years 1947 to 1962 inclusive have been identified and the numbers collected tabulated. Information relevant to collecting stations is presented in tables and on maps. (Author.)


Contains data on the food and conditions of nourishment of various invertebrate fauna (Echinodermata, Lamellibranchiata, Crustacea, Tunicata, and Brachiopoda) found on or in the bottom of the Barents Sea; the region of the study includes the central section of this sea, Bear Island waters and the Pechora-Karin-Kolguyev shallows. (Arctic Biblio.)

Lists arctic members of this group with locations.


Contains summary of a hydrographic-oceanographic survey, conducted summer 1955 by USS Requisite in the Western Arctic. Ship’s main track, location of oceanographic, current, and bottom sampling stations between Pt. Barrow in Alaska and Shepherd Bay, Northwest Territories, and special hydrographic survey areas, are shown on maps; tables summarize observations at 99 oceanographic stations, 46 Phleger cores and 85 grab samples, and Ekman current meter observations at 19 locations. Explanation of data is provided in the appendix. Depths in survey areas were shallow; observations were mostly made at 20 meters or less. (Arctic Biblio.)


Contents: navigation; weather and ice conditions; cruise narrative and survey procedure; notes on the physical oceanography of the Chukchi sea; a preliminary report of the benthic animals collected on the USCGC Northwind cruise during 1962; notes on bottom sediments of the Chukchi Sea; bathymetry; reconnaissance magnetic survey of the Chukchi Sea shelf. (NTIS.)


Description of 24 forms of these worms from the deep sea and coastal waters. Six of the forms are new species, one of the species also a new genus. Morphology and morphometry, external and internal anatomy, size, color, ecology, etc., are considered. (Arctic Biblio.)


Contains a summary of results of the study of flora and fauna of the coastal waters of Novaya Zemlya, based on material from 64 dredging and 290 trawling stations established during 1923-27 by the Hydrological Institute. Characteristics of the faunistic groups and their geographic variations are given. (Arctic Biblio.)

Description of eleven (including one new) species of these flatworms taken 1921, 1924 and 1925 by the Northern Scientific and Economic Expedition, 1920-26, with data on their localities and distribution. Summary in English. (Arctic Biblio.)


A comprehensive study of the littoral, sublittoral and pseudoabyssal of this strait between the two islands of Novaya Zemlya. It is introduced (p. 5-40) with an outline of the scope of the investigation, earlier studies, topography of the area, nature of bottom, hydrological conditions of the strait, and meteorological observations. The biocoenoses of the three zones are described (p. 41-63), the sublittoral showing the quantitatively and qualitatively richest fauna. The seaweeds of the area, distribution of the benthonic forms and general character of the fauna are treated in turn. Tables are presented indicating, in detail, the distribution of the main animal groups over the area, by a list of dredging and trawling stations and the forms found at them. The study is based on field work conducted during 1923-1929. (Arctic Biblio.)


A biological study of bottom fauna made during the expedition of the icebreaker Krasin, 1935, with lists of species found in bottom samples from different stations in the Chukshi Sea. (Arctic Biblio.)


Lists, with descriptions, discussion and locations of sixty-two species based on collections made during the period 1921-30. Summary in English. (Arctic Biblio.)

Ushakov, P.V. 1940. O Novoi Gruppe Ologomernykh Chervei (Pogonophora) s Abissal'nykh Gribok Okhotskogo Moria i Poliarstogo Basseina. (On a New Group of Oligomere Worms, Pogonophora, from Abyssal Depths of the Okhotsk Sea and the Polar Basin.)
Deals with a group of deep-sea marine worms, one of which was described from the Okhotsk Sea by the author in 1933, under the name of *Lamellisabella zachsi*. The same species was found by G.P. Gorbunov, on a trip on the *Sadko* in 1935 in the Arctic Basin. This species was first referred to the group Polychaeta, but was transferred by K. Johansson in 1937 to a new group, Pogonophora. (Arctic Biblio.)


A find of this hydroid from the Kola Bay is reported. (Arctic Biblio.)


Contains account of the location of the station (69°07' N, 36°05'E) and description of its surroundings; its main purposes; principal buildings, research vessels, museum and library; account of its research activities during 1936-1938; short notes on the deep-water fauna in the vicinity of the new station followed by a list of over 600 species of animals found in this area. (Arctic Biblio.)


Two new species of bristle-worms, *Scolelepis derjugini* n. sp. and *Scolelepis murmanica* Zachs, n. sp. are described. (Arctic Biblio.)


Based on Russian investigations by P. IU. Shmidt, Prof. K.N. Deriugin, and others, 1905-1945. Common biogeographical features of the Japan, Okhotsk and Bering Seas are discussed, as well as the faunal character of each sea individually. The difference of their fauna from that of arctic seas is noted. (Arctic Biblio.)

Contains a systematic list of 35 species of marine organisms, inhabiting the Sea of Okhotsk at a depth of 3000 m or more, based on collections of Russian expeditions since 1932, and on data from the voyage of the U.S. Fisheries research vessel *Albatross* in 1906. Comparison is made with the deep-sea fauna of the northern Pacific Ocean. (Arctic Biblio.)


Contains brief descriptions of worms collected during 1950-55 in the central Arctic Basin by the Russian drifting stations, North Pole 2-5. Three out of 16 benthal forms are new species; *Macellicephala longipalpa*, *M. polaris*, and *Melinnexis somovi*. The forms found suggest an Atlantic rather than Pacific origin. A new genus is described from the Antarctic material. (Arctic Biblio.)


Contains information on relevant activities of the Institute from its earliest times (18th century) to present. Its work (largely taxonomic) covering the major animal groups is described in detail, and the scientists performing it are indicated. Studies in populations and their distribution, publications, etc. are also discussed. (Arctic Biblio.)


Reports studies on the Vitiaz since 1949 by the Institute of Oceanology, Academy of Sciences, USSR. Vertical and horizontal distribution of fauna in the Japan, Bering, and Okhotsk Seas is discussed, also exchanges (mostly northward) of fauna between these seas. Faunistic boundaries between the Japan and Okhotsk Seas occur at La Perouse Strait, Catherine Strait, and the Amur Estuary; and between Bering and Chukchi Seas in the Bering Strait region. Some species penetrating these barriers are noted. (Arctic Biblio.)

List of eleven species of worms with some notes, including location of specimens found on the Howgate Polar Expedition, 1877-78. (Arctic Biblio.)


Annotated list of four species of tunicates and eight species of polyzoans, collected during the Howgate Polar Expedition to Cumberland Sound, 1877-78. (Arctic Biblio.)


Annotated list of six species of echinoderms, three hydroids, two anthozoans, and mention of Porifera collected during the Howgate Polar Expedition to Cumberland Sound, 1877-78. (Arctic Biblio.)

Verrill, A.E. 1914. Monograph of the Shallow-Water Starfishes of the North Pacific Coast from the Arctic Ocean to California. Smithsonian Institute, Washington, D.C. V. I, 408 p; V. 2, 110 plates.

Contains description (in detail) of the habits, morphology and classification of forms, with a list of forty-three species from the arctic coast of Alaska, the coasts and islands of Bering Sea, south to the Aleutian Islands and Alaska Peninsula, and fifty species from southeastern Alaska. (Arctic Biblio.)


Lists, with descriptions, taxonomic revision, and distribution noted, of thirty-three (including five new) alcyonarian species (soft corals and sea pens) from the waters of Bering Strait, the arctic coast of Alaska and Canada, Hudson Bay and east coast of Canada; also twenty-seven (including five new) actiniarian species (sea anemones) from all coasts of Canada and Alaska. (Arctic Biblio.)

Preliminary account of a study of forams from bottom sediment samples collected during the 1963 field season, East Bay, being considered to provide a representative available, inshore environment. Previous work, and the methods used to obtain and treat the 76 selected samples are described. Environmental conditions are considered as they affect the distribution of the 84,513 forams counted. Of the 48 species identified, 33 are arenaceous, 15 calcareous. The high ratio of arenaceous to calcareous species appears unrelated to bathymetry; but the cold environment with extended ice cover may produce conditions inhibiting calcareous forms. (Author).


Foraminiferal species counts from 75 sediment samples from East Bay, Mackenzie King Island at 77°50'N 110°30'W, were converted to a matrix of presence-absence data. These were submitted to both normal and inverse association-analysis as a preliminary test of the application of the multivariate method to problems in marine ecology. Maps of stations and bathymetry are shown. Although the sampling pattern was not the most suitable for such analysis, the results indicate that the method might prove quite informative. (Arctic Biblio.)


Considers conservation of crab in these waters. The location of the nursery is on the western shore of Shelekhov Bay, from where young crabs descend to 10-60 m depth for the first time at the age of 3 yr, and join the adults traveling north only at 7 yr. Drawings illustrate the developmental stages of the crab. Strict observance of fishing regulations is urged to restore the depleted reserves of crab in Kamchatka. (Arctic Biblio.)


Attempt is made at geographic subdivision of the abyssal region (hitherto considered cosmopolitan and homogeneous) on the basis of distribution of Spongia, Coelenterata, Cirripedia, Isopoda, Pantopoda, and Echinodermata. The orders are mostly (85 percent) confined to a certain ocean. The going scheme presented includes the northern Pacific province (Okhotsk and Bering Seas) and the Arctic subprovince (Barents Sea, Svalbard Waters, Greenland Sea and Greenland Waters). The latter is connected with the Atlantic Ocean province: 32.5 percent of the Arctic deep-sea species are of Atlantic origin, but it is quite different from the northern Pacific province. (Arctic Biblio.)

Results of a study of the zoobenthos of the southern Beaufort Sea continental shelf. 337 species of invertebrates were identified from 82 stations. The author believes the data (physical and biological) indicate the existence of four zones across the shelf. Includes station data and species list.


Biological results of 17 samples of five grabs each taken from inshore areas of the Beaufort Sea at depths of 3 to 94 m. The number of species, their density and biomass are given. Includes tables and maps.


Deals with recent organisms from the surface of the sea bottom at 15 of the 17 off-shore stations along the line 77°51.5' N, 115°36' W to 80°04.5' N, 97°10' W, and northwest from Cape Isachsen of Ellef Ringnes Island to 80°42' N, 112°50' W. Foraminifera were the most important group, molluscs and ostracods next in abundance. Some forams have value as depth-indicator species for certain broad bathymetric zones, shelf, slope, etc. Some were also found to be zonally characteristic near ice island T-3; and others apparently serve as indicators only in this project area. The Atlantic or Pacific affinities of the Arctic fauna should be indicated as work continues for some conclusion regarding water circulation, ocean currents, etc. (Arctic Biblio.)


Lists and discusses the depth distribution and affinities of invertebrate faunas collected at traverses seaward 115 mi northwest of Ellef Ringnes and 95 mi northward of the tip of Borden Islands in 1962, by Geological Survey of Canada personnel connected with the Polar Continental Shelf Project. Of the 133 species recognized, 86 are foraminifera, 25 molluscs, 11 ostracods, and a few sponges, bryozoans, annelids, and echinoderms. (Arctic Biblio.)


Systematic description of isopods includes 25 species known in arctic regions from the Barents Sea to northern Canada. Cited depths of occurrence range to 200 meters. Several species are described as parasitic. (Arctic Biblio.)


The present paper contains a revision of the species of Rissoidae which were collected by the Norwegian North Atlantic Expedition 1876-78. One new species, Alvania pseudosyngenes, is described. Types are selected of the species described by Friele. Further information, most often based on unpublished material in Scandinavian museums, on the variation, distribution, and taxonomy of these species, is given. The determination of some specimens is corrected. (Author.)


Lists arctic cirripeds with locations.


A systematic geographical treatment of the Polychaetes from the northwestern parts of the Atlantic Ocean, north of 60°N and west of 0° longitude.


Description of Periploma alaskana, n. sp., a clam from Chukchi Sea and from Prince William Sound. (Arctic Biblio.)


Description, with illustrations, of Stenhelia nuwukensis sp. n., a marine-brackish water harpacticoid found in Nuwuk Lake, arctic Alaska.

Study of distribution by depth of 16 forms, and by temperature of 12 forms, in the Chukchi, Bering, Okhotsk and Japan Seas. The ranges of distribution by depth and by temperature are formulated for most species. The degree of range variability by depth and by temperature was found to be different in different species. (Arctic Biblio.)


Presents recent data on the distribution of these shrimps and discusses the possible conclusions regarding the evolution of the members of this family.


Contains the results of investigations carried out by the author in Kola Bay, Barents Sea, on hard substrata in fresh and sea water "fouled" with molluscan encrustations; data are given on the rate of growth of Balanus balanoides, Mytilus edulis and Hydroidea (number of specimens, weight in grams, total weight of the encrustation, etc.) for every month. (Arctic Biblio.)


Contains data on the progress of this study during 1917-37, and on many expeditions in the arctic seas and their achievements; bibliography (about 200 items). (Arctic Biblio.)

An extensive monograph, based on 25 years work on Russian seas by the author and his students. The first part is devoted to the arctic seas: General characteristics (p. 11-14); Barents Sea (p. 45-138); White Sea (p. 139-66); Kara Sea (p. 167-89); Laptev Sea (p. 190-94); and Chukchi Sea (p. 195-99). For each sea is given its general characteristics, history of its exploration; physico-geographical hydrological, hydro-chemical and geological characteristics, flora and fauna (plankton: composition, distribution, migration, food value, etc.; benthos: kinds, composition, distribution, biomass, etc.; the fish fauna: general composition; commercial fishes, their growth, food, migrations, etc.; fisheries); zoogeography. At the end (p. 519-38) is a bibliography for all parts of the volume (over 1000 items), also (p. 562-83) an index of species, as well as the usual subject-geographic and author indexes. Vol. 1 of this work has not been located, its scope is indicated (V. 2, p. 8) as: general oceanography, marine biology, ecology and zoogeography in genera. (Arctic Biblio.)


Contains the results of a general study of the organic life of oceans and horizontal and vertical fluctuations of the marine fauna, with statistical data on quantitative distribution of algae and benthos in various seas including all arctic seas of the USSR and some other extra-Russian Seas. (Arctic Biblio.)


Contains a historical review of this work, with emphasis on the achievements during the Soviet regime; includes data on expeditions for the study of the fauna of northern seas (Barents, White and Kara Seas) p. 179-83, and the seas of the Far East (Okhotsk and Bering Seas); bibliography (129 items). (Arctic Biblio.)


Description of nine species of these worms, seven of them new. Five of the latter form three new genera: Jacobia, Vitiazema and Alomasoma. Location and depth of find are noted as well as nature of substrate, etc. The material was collected during cruises of Vitiaz' in the Bering and Okhotsk Seas. (Arctic Biblio.)

Zenkevich, L.A. 1958b. Obshchaia Kratkaia Kharakteristica Kachestvennogo Sostava i Kolichestvennogo Raspredeleniia Donnoi Fauny Dal'nevostochnyh Morei SSSR i Severozapadnoi Chasti Tikhogo Okeana. (A Brief General Description of
the Bottom Fauna in the Far Eastern Seas of the USSR and the Northwestern Part of the Pacific Ocean.) Akademiia Nauk SSSR. Institut Okeanologii. Trudy. 27:154-160.

Authors draw attention to the diminution in quantity of the benthos from \(1000 \text{ g./m.}^2\) on the continental shelf to \(10 \text{ g.}\) on bottoms 1000-2000 m deep and to a fraction of gram on the abyssal. Qualitative distribution is found to depend on the distance from the coast, degree of isolation from the ocean and on vertical zonation. More common benthic forms of the area are discussed. (Arctic Biblio.)


Encyclopedic study by the Nestor of Russian marine biology. Introduction treats the area and other parameters of the 14 Russian (including the Caspian and Aral) seas, their geographic location, orography, geology, and water balance; also research, research institutions, and main serial publications. Pt. 1 (p. 17-210) deals with the arctic seas, their hydrology, fauna and flora including plankton and benthos. This general description is followed by detailed accounts for the six seas, from the Barents eastward to the Chukchi. Each is treated as to general characteristics, exploration and research, physical and geographic traits, flora and fauna, especially plankton, benthos and fishes. Pt. 4 covers the seas of the Far East, including the Okhotsk and the Bering (p. 601-646). Appendix is an extensive literature list, indexes of persons, Latin names and subjects. (Arctic Biblio.)


Contains data on the evaluations of bottom complexes of marine fauna of Barents Sea with the aid of diagrams and density curves of the benthos population; the influence of certain factors on benthos distribution and the method proposed by the author for their evaluation is discussed. This study is based on collections of the State Oceanographic Institute, 1924-33. Summary in English. (Arctic Biblio.)


Lists and has a key for arctic cumaceans with locations.

Attempt is made at a rough estimate of the marine invertebrates of the various Russian seas, and possibilities of utilizing commercial molluscs, crustaceans, and echinoderms. The importance of such crustaceans as the Kamchatka crab, Pandalus borealis, Sclerocrangon boreus and edible molluscs (Mytilus edulis, Machaera costata, Haliotis gontschatcara, etc.) is stressed. The study is arranged by the seas, and includes the northern waters of the USSR, Okhotsk, and Bering Seas. (Arctic Biblio.)