

P l a n k t o n   C o m m i t t e e

1965

By J.H. FRASER

Belgium

(E. Leloup)

Plankton research in Belgium in 1965 was concerned with:

Phytoplankton of the port of Ostend.

Phytoplankton of the sluice-dock (bassin de chasse) of Ostend in relation to the oyster culture.

Floristical study and statistics of plankton samples collected during previous years at the lightvessel "West-Hinder".

The programme in 1966 is expected to include:

Qualitative and quantitative phytoplankton.

Systematics and statistics.

Variations of the planktonic quantities, chemical composition. Study of certain minor elements present in sea-water and their possible influence on the variations of the planktonic quantities.

Denmark

(Vagn Kr. Hansen)

1. Grønlands Fiskeriundersøgelser

West Greenland

The observations at sea were kept at a minimum, because R.V. "Dana" was not at disposal.

The usual distributional surveys for fish eggs and larvae were limited to a few E.-W. sections across three fishing banks.

The regular observations at the permanent station in the mouth of Godthåb Fjord were discontinued in August.

2. Danmarks Fiskeri- og Havundersøgelser

The sorting of the plankton samples taken during NORWESTLANT 1-3 by S.200 Net and Gulf III Sampler was completed, and the data forwarded to the conveners. The samples collected in 1964 in the same area and with the same gears are being sorted.

Measurements of the primary production and collection of zooplankton with 8 litre waterbottles were continued from the lightvessels "Anholt Nord" and "Læsø Rende". Intervals of observations every two weeks. The observations from L.V. "Læsø Rende" were discontinued in November (the lightship being exchanged with an automatical beacon), and in December transferred to L.V. "Aalborg Bugt".

The investigations on the productivity of the micro-vegetation at the tidal flats in the Danish Waddensea were discontinued. A final report is being completed.

Experiments on mean-flow velocities in three plankton gears: The Hensen Net, the Indian Ocean Standard Net and the Gulf III Sampler, were continued. The gears were hauled horizontally at various speeds of advance in the test tank at the Hydro-og Aerodynamisk Laboratorium.

#### Programme for 1966

#### Danmarks Fiskeri- og Havundersøgelser

The hydrodynamic investigations on mean-flow velocities in plankton gears made in a test tank were completed in January.

The plankton programme operated from the L.V. "Anholt Nord" and "Aalborg Bugt" will be continued and enlarged through inclusion of L.V. "Halskov Rev" from February.

A comparative investigation on the vertical distribution of zooplankton in the plankton-poor Sargasso Sea (in January-February and in April) and the rich Irminger Sea (in June) will be made from R.V. "Dana".

R.V. "Dana" will operate in the Sargasso Sea in two periods (Biological Cruise I & II). It started from the Azores on January 20 and arrived at Bermuda on February 22. In total 25 stations were operated. Plankton hauls with large plankton nets (opening diameter 300, 200 and 150 cm) were taken at 23 stations. Pelagic trawls were used at 6 stations, and at 10 stations were taken water-samples of capacity 100 litre and 8 litre in vertical series from the surface down to maximum 200 m.

A similar programme will be made from the end of March till the middle of April.

The main purpose of the Sargasso cruises is to trace the spawning area, period, and depth of Anguilla, and follow the development and spatial and temporal distribution of the Anguilla larvae.

In July the usual distributional survey for fish eggs and larvae will be carried out in West-Greenland waters. Gear: 2-metre ring net.

#### Finland

(E. Halme)

Plankton:

#### Tvärminne Zoological Station

Work has continued on the population analysis of Aurelia aurita and on the regional occurrence of Mysis relicta, M. mixta and Neomysis integer. Phytoplankton studies have been made especially on the Chlorococcales.

Bottom fauna:

#### Institute of Marine Research

The quantitative study of the bottom fauna in the seas around Finland with the Van Veen grab, started in 1961, was continued in May and June, and the area extended southwards to the section Trelleborg-Arkona.

#### Tvärminne Zoological Station

Quantitative sampling of the bottom fauna was continued, and studies of the interstitial fauna of the sandy bottoms were also continued. The ecology of Iaera spp, Idotea spp and Fucus vesiculosus was studied.



University of Turku Marine Biological Station

Investigations have been made on the biology and distribution of Crangon crangon in the Archipelago Sea and Bothnian Bay. The description of the benthos in the same area has been carried out by several workers. The studies have concerned macro-benthos, but they are now bending to the micro-benthos.

In co-operation with the Swedish biologists and research vessels the benthos in the Bornholm Deep has been studied as well as the changes in the composition of benthic communities due to pollution off harbour of Gothenburg. In addition to this a pollution research off the cities Turku and Naantali has been performed.

Biological Station at Krummit (Oulu University)

Faunistical and ecological studies of the bottom fauna, particularly the winter ecology of Saduria entomon (Isopoda).

France

(M.-L. Furnestin)

I. Travaux de l'Institut des Pêches Maritimes, Paris.

Poursuite de l'étude du plancton du Golfe de Gascogne, faite à partir de prélèvements trimestriels entre la côte et 8° ouest, portant sur les années 1964 et 1965;

-volumes du zooplancton (cartes de répartition quantitative par saison et par année);

-recherches des oeufs et larves de poissons, notamment des poissons commerciaux (cartes de répartition saisonnière).

Programme pour 1966

Etablissement des relations entre les concentrations de plancton d'une part, d'oeufs et larves de poissons d'autre part et les conditions hydrologiques dans le Golfe de Gascogne.

Etude de quelques éléments des communautés planctoniques dans le Golfe de Gascogne (Chaetognathes, Méduses, Salpes, Doliolles, etc..).

Recherches sur le thème proposé par le Conseil International: "prédation des jeunes stades de poissons par les organismes planctoniques".

II. Travaux des Laboratoires conchyliques de l'Institut des Pêches Maritimes

Poursuite des travaux concernant;

-la recherche et l'évolution des larves des mollusques comestibles (Ostrea edulis, Crassostrea angulata, Mytilus edulis);

-les variations qualitatives et quantitatives du microplancton des eaux dans les centres de production conchylicole;

-la teneur en pigments chlorophylliens en eaux libres et en claires.

Programme pour 1966

A ces mêmes travaux seront associés: des dosages de phosphates dans les eaux de la rivière d'Auray (Bretagne); de nouvelles recherches sur le verdissement des huîtres dans la région de Marennes (nature et processus de la pigmentation de Navicula ostrearia).

III. Travaux du Laboratoire de Biologie animale (Plancton), Faculté des Sciences, Marseille

Achèvement de l'étude systématique, écologique et biogéographique des Chaetognathes des récoltes danoises ("Atlantide", "Galathea") dans les eaux africaines.

Observations sur les espèces de Chaetognathes les moins communes ou de découverte récente dans les eaux ouest-africaines: Sagitta tenuis, S. bedoti, S. bierlii; S. neodecipiens, S. tasmanica, S. bipunctata (au 2e cycle de maturation?). Observations complémentaires sur les Eukrohnia (E. proboscidea sp. n. et E. bathypelagica).

Poursuite des observations sur les indicateurs planctoniques:

- modalités de pénétration en Méditerranée des formes atlantiques suivantes: Penilia avirostris et Evadne nordmanni (Cladocères), Cuvierina columnella et Spiratella lesueurii (Ptéropodes);

- synthèse des connaissances sur les indicateurs du courant atlantique en Méditerranée (Copépodes, Chaetognathes, Mollusques pélagiques, Euphausiacés, Ptéroméduses, Cladocères).

Programme pour 1966

Synthèse des travaux poursuivis depuis 1960 sur les Chaetognathes des eaux tropicales et équatoriales africaines (récoltes de l'"Ombango"); formes de surface et de la profondeur. Rédaction d'un mémoire.

En collaboration avec l'Institut des Pêches Maritimes: étude des organismes planctoniques d'appartenance méditerranéenne en relation avec les eaux de même origine dans le Golfe de Gascogne.

Mise au point des observations sur le thème proposé par le Conseil International: "usage des appareils enregistreurs dans la recherche planctonologique".

Germany

(J. Krey)

Biologische Anstalt Helgoland

The evaluation of samples of the North Atlantic ("Anton Dohrn" 1955) was continued by Dr. Aurich. He was able to compare the hydrographical classification of the ocean with that of zooplankton. Doliolum and Globigerina, for example, were found to be connected with the warm water of the Atlantic while Calanus hyperboreus was mainly found in sub-polar waters and in the Irminger Sea. Eukrohnia hamata (Chaetognatha) on the other hand could be observed in all waters, whereby the lowest number of individuals could be observed in shallow waters. Calanus finmarchicus could, however, be found in the whole area, they were found to vary considerably in size.

Dr. Gillbricht examined the relationship between various biological, chemical and physical data near Helgoland and in the southern North Sea. Hereby important correlations for the analysis of the metabolism were discovered.

Under the authorization of the main programme for the exploration of the ecology of the Bay of Helgoland, standing stock of plankton and primary production were measured (Dr. Aurich, Dr. Hagmeier) and at the same time data of hydrography and nutrient supply were collected (Dr. Gillbricht). Determination of oxygen from exposed and unexposed samples of water of Helgoland roadstead gave an impression of production and decomposition of organic substance during the year. Up to March the balance of oxygen was negative; from March to June production and consumption were equivalent; from July and onward the reconstruction of organic substance began to surpass the decomposition; from November the balance of oxygen has been equalised again. Respective determinations on enriched plankton gave information on the assimilation and respiration of some species, forming the bulk of the standing stock.



By cultivation Dr. Drebes began to analyse the life cycles of plankton-diatoms which were important for Helgoland. Measurements of assimilation and respiration could hereby be made.

Institut für Küsten- und Binnenfischerei

218 plankton samples were taken from April to October over a net of fixed stations along the German North Sea coast in order to study the distribution of Crangon larvae in relationship to hydrographic and other factors.

Routine investigations on the plankton composition in the Elbe-estuary have also been continued. 200 plankton samples were taken at the "Alte Liebe" station at Cuxhaven and analysed.

Institut für Seefischerei

The Institut für Seefischerei (Hamburg) continued counting the plankton samples taken in the North Sea region in 1953 (Gauss-trip, August 1953 and 1964; Anton Dohrn-trip, August-September 1964).

Institut für Hydrobiologie und Fischereiwissenschaft der Universität Hamburg

During 1965 the following planktological works have been done at our institute:

- 1) Investigations on the Appendicularia of the Gulf of Naples from plankton samples taken in May 1962.
- 2) Participation in the International Indian Ocean Expedition on R.V. "Meteor" in the Arabian Sea. Investigations on plankton organisms of the deep scattering layers in waters with extreme oxygen deficiency.
- 3) Comparative experiments on determination of settled volume and displacement volume of plankton samples.
- 4) Experiments on the mortality of fish fry in relation to the qualitative and quantitative composition of plankton.

Institut für Meereskunde der Universität Kiel

- 1) Under the authorisation of the International Council for the Exploration of the Sea regular investigations on the productivity have been made in the western Baltic Sea aboard "Hermann Wattenberg" (annual cycle of nutrients, micro-biomass, zooplankton and detritus).
- 2) Investigations on the productivity in the Elbe-estuary.
- 3) Participation in the IQSY-expedition to the Tropical Atlantic, especially aboard the Brazilian research vessel "Almirante Salgania" (determinations of micro-biomass and particulate carbon).
- 4) Research work of Dr. Lenz and Dr. Zeitzschel in Edinburgh at the Oceanographic Laboratory (analysis of plankton recorder material).
- 5) Research work at the Station Marine d'Endoume et Centre d'Océanographie in Marseille concerning productivity (determination of particulate carbon).

Iceland

(I. Hallgrímsson)

Zooplankton

A zooplankton survey was carried out in Icelandic waters from May 8th to May 26th and zooplankton samples were collected on Icelandic herring grounds from June 2nd to August 19th.

Most of the material was worked up at sea by a short-cut method.

From August 26th to September 11th a zooplankton survey was carried out in the Irminger Sea.

Larvae of bottom invertebrates were collected in Icelandic fjords, and zooplankton material collected in the Irminger Sea in 1961 was worked up.

#### Phytoplankton

Measurements of primary production in Icelandic waters by means of the  $C^{14}$ -technique were carried out at the standard depths of 0, 10, 20 and 30 m. As previously, samples for quantitative analyses of phytoplankton were collected wherever productivity was measured.

The productivity measurements were carried out at 75 stations during 8-23rd of May and repeated at 61 stations during 2-26th of June off the west, north and north-east coasts of Iceland.

In late July and early August the productivity was measured at 11 stations off the north-east and east coasts of Iceland.

During August 11-19th the measurements were once more repeated at 23 stations off the north and north-east coasts.

From August 26th to September 11th productivity measurements were made at 35 stations in a section between the west coast of Iceland (Látrabjarg) and the east coast of Greenland (Angmagsalik). At one of these stations (pos.: 64°39'N, 27°11'W) the measurements were repeated in 0 and 10 m 13 times during 48 hours.

The collecting of samples for quantitative analyses of phytoplankton from the transparency meter on board "Gullfoss" was continued.

#### Ireland

(F.A. Gibson)

Ireland reports no plankton work carried out there in 1965.

#### Netherlands

(P. Korringa)

In the reports to the Near Northern Seas Committee, the Herring Committee and the Shellfish Committee plankton work carried out by the Netherlands concerning abundance and distribution of eggs and larvae of fish and shellfish has been mentioned.

Periodical observations have been made in the coastal water at IJmuiden to detect plankton blooms, which could lead to adverse conditions for fish and shellfish.

#### Norway

(T. Braarud)

#### University of Oslo

##### 1) Phytoplankton surveys

(a) An all-year survey of the phytoplankton of Ulsfjord, Troms, in collaboration with Tromsø Biological Station. Report completed. (B.R. Heimdal).

(b) A hydro-biological survey of Grønnsfjord-Lenefjord, Vest-Agder. Report completed.

(c) An all-year survey of the phytoplankton of the Trondheimsfjord. (E. Sakshaug).

(d) Phytoplankton investigations as part of a special study of the effect of pollution in the Oslofjord 1962-65. Report in preparation. (T. Braarud and I. Nygaard).



(e) Investigations of dinoflagellate populations in Norwegian coastal waters in connection with toxicity studies on mussels. (T. Braarud).

## 2) Special phytoplankton studies

(a) Taxonomical studies of marine planktonic diatoms. (G.R. Hasle).

(b) Taxonomical studies of coccolithophorids. (K.R. Gaarder).

(c) Physiological studies on coccolith formation in Coccolithus huxleyi. (E. Paasche).

(d) Studies on chrysophyceans in Norwegian coastal waters. (J. Throndsen).

## 3) Zooplankton

(a) Studies of pelagic larvae of benthic invertebrates in monthly net-haul samples at five stations in inner Oslofjord. (T. Schram).

(b) Correlation of echo-registrations with observations on hydrography and plankton in the Oslofjord. (E. Rosenvold and S. Tveite).

(c) Zooplankton investigations as part of a special study of the effect of pollution in the Oslofjord, 1962-65. Report in preparation. (E. Beyer, A. Dybwad and J. Versvik).

Institute of Marine Research, Bergen (K.F. Wiborg)

### Phytoplankton

Water transparency has been recorded continuously with Berge's transparency meter during cruises in East Greenland waters, and in the Norwegian and Barents Seas.

Chlorophyll analyses were carried out in the Norwegian Sea during May and June.

A particle counter has been designed and built, and will be tested at sea in 1966.

A Beckmann oxygen analyzer has been modified and equipped with a fast response temperature-recording device.

### Zooplankton

Sampling was continued at the permanent oceanographical stations along the coast of Norway and Spitsbergen. The Utsira station near Stavanger, was included in the sampling in December.

Plankton volumes were of the same magnitude as in 1964: As in the previous year, salps were observed at Sognesjøen, Skrova, and Eggum (West coast and Lofoten area) in October. Salps were not found at Northcape possibly because of too scarce observations.

The weathership station M was worked throughout the year. Salps were observed from the middle of August to the middle of October.

During March-April zooplankton was collected with Juday nets, Clarke-Bumpus plankton samplers and a 3-foot Isaacs-Kidd pelagic trawl on the coastal banks between Stad and Vesterålen with the R.V. "G.O. Sars". The distribution of fish eggs and larvae, especially of herring, was studied. Drift, vertical distribution and vertical migration of herring larvae were studied during 24 hours in two localities, off Møre and on the Træna Bank.

As in the previous year, vertical hauls with a Hensen standard net were made during a cruise with the R.V. "G.O. Sars" in the Norwegian Sea in May-June in co-operation with Icelandic and Soviet-Russian research ships in order to study the distribution of zooplankton in relation to herring.

During the cruise of R.V. "Johan Hjort" in West-Greenland waters in April-May, vertical hauls were made with Hensen net for sampling of cod eggs and larvae.

Since 1964, krill (Euphausiacea) have been fished commercially on a small scale in a fjord on the west coast, being attracted by stationary lights at the quays during night, and fished with a dip net during February-May. Catches up to 500 kilograms per night have been taken. A study of the biology and behaviour of the krill has been started.

#### Poland

(W. Mańkowski)

The plankton investigations at the Baltic Sea were carried out in two separate groups:

1. In the open sea of the southern part of the Baltic. During 6 cruises in January, March, May, August and November 192 samples have been collected with Hensen and Nansen nets as well as International (Copenhagen) Standard nets.

2. In the Polish coastal zone 4 seasonal cruises were made during which 222 samples were taken with Hensen and Apstein nets. The plankton samples in the Baltic Sea were mainly taken vertically from bottom to surface but some were taken to sample intermediate layers. A few sub-surface horizontal hauls were also taken.

The results from these collections will be used to prepare a table of vertical and horizontal layers of phyto- and zooplankton as well as ichthyoplankton.

In addition to the above investigations 9 cruises were also made in Gdańsk Bay when 85 samples were taken for the estimation of primary production by means of the oxygen and isotope methods. Investigations were made from three cruises of M.T. "Birkut" in the North Sea. During the first, in June, the area investigated was widened by extending the cruise round the British Isles.

In all, 333 samples were collected at 105 stations, by vertical hauls using Hensen, Standard and Nansen nets as well as a 210 cm ringtrawl. All the samples have now been analysed.

#### Programme for 1966

Further investigations will be carried out in the year 1966 in the open sea of the Baltic and the North Sea.

#### Portugal

(Maria Helena Vilela)

#### Activities in 1965

Zooplankton sampling has been carried out in the estuaries of the Tagus and the Sado, paying special attention to the oysters' larvae.

#### Activities in 1966

The programme in the Tagus and the Sado will be continued in 1966. Fish larvae on the Portuguese south coast will be collected and studied. The study of the copepods collected on the Portuguese coast during the cruise of the vessel "Faial", before 1965, is expected to be completed.



Spain

(M. Massuti)

Les investigations réalisées durant l'année 1965 furent les suivantes:

Instituto Español de Oceanografía

1. Étude des échantillons de plancton provenant des pêches systématiques réalisées par les laboratoires de Santander, Malaga et Baléares (voir rapports des Comités de la Sardine et des Mollusques et Crustacés).
2. On a poursuivi au Laboratoire de Baléares l'étude du phytoplancton de la Baie de Palma, par le dosage des pigments suivant la méthode de Harvey.
3. Pendant la campagne accomplie en juin par le bateau "Xauen", on a recueilli en mer de Baléares des échantillons de pêches verticales.

Programme pour 1966

. Continuation des études des échantillons de plancton provenant des pêches systématiques des laboratoires de l'Institut Espagnol d'Océanographie et de celles réalisées dans les campagnes océanographiques espagnoles.

Sweden

(A. Lindquist)

1965 Samples have been collected on standard stations in the Baltic and in the Bothnian Sea as a continuation of a long-term investigation of the marine environment.

The material collected from egg and larvæ-surveys in the Skagerrak and Kattegat May to June 1959 to 1963 has further been worked up.

1966 The work mentioned above for 1965 will be continued, and it is hoped to publish the results from the egg and larval surveys. Samples will be collected in the Kattegat and Skagerrak to study the reproduction of certain crustacea.

United Kingdom

I. England

(J.G. Cattley)

Most of the plankton sampling from English research vessels was concerned with fish egg and larvae studies and was carried out with High Speed Samplers of various designs based on the Gulf III sampler. Fish eggs and larvae have taken precedence in the analysis of the samples.

(a) Iceland.

During May five lines of stations were worked with a 20-inch diameter sampler over the shelf of Patreksfjord, Gardskagi, Westman Isles, Portland and Eystrahorn.

(b) West of Scotland and north-west Ireland.

Two surveys for herring larvae were carried out in late August and mid-October over the continental shelf and in coastal waters between 54°30'N and 59°30'N.

(c) Irish Sea

A grid of stations in an area bounded by the coasts of Lancashire, North Wales and Anglesey and the parallel of 53°50'N was surveyed thirteen times between mid-February and late May, using 20-inch, 25-inch and 30-inch samplers. The programme was designed to study the distribution and abundance of plaice eggs and larvae from the spawning ground north of Great Ormes Head; and it also showed that the area is an important spawning ground for dab, flounder, whiting and cod.

(d) Southern North Sea.

Two surveys for herring larvae were made in mid-November and early December in the southern North Sea and eastern English Channel.

(e) Other work.

The British Ocean Weather Ships continued to take vertical hauls for zooplankton weekly when on stations A, I, J or K.

Samples of the bottom plankton were taken monthly with a special sampler in Red Wharf Bay, Anglesey, as part of a detailed study of the biology of young flatfish.

II. Scotland

(J.H. Fraser)

Aberdeen

Plankton sampling from the Scottish research vessels in 1965 has given a good general coverage of the northern North Sea and off the west coast of Scotland. The Faroe-Shetland Channel and Faroese waters were sampled in May/June and in November. Plankton samples were collected by the British survey ship H.M.S. "Dalrymple" from the Rockall area in April and June.

Plankton work at the Aberdeen Laboratory was on the following lines:

- a) Plankton and its relation to the general environment and the fishery (Zooplankton J.H. Fraser, Phytoplankton D.D. Seaton).
- b) Routine collection of zooplankton standing crop data (biomass, dry and organic weights) from the northern North Sea and west coast waters (J.A. Adams).
- c) Herring-plankton relationships in the northern North Sea (J.A. Adams).
- d) Population studies of Metridia lucens, and in lesser detail of Spiratella retroversa, Clione limacina, Pneumodermopsis paucidens, Centropages typicus and Candacia armata (J.A. Adams).
- e) Experimental shipboard studies of the feeding of zooplankton species (J.A. Adams, I.E. Baird).
- f) Primary production studies in the North Sea, and on benthic algae on an exposed sandy beach (J.H. Steele, I.E. Baird, N.T. Nicoll).
- g) Effect of hormones (auxins, gibberellins and kinetins) on the growth of marine unicellular algae (S.M. Reid).
- h) Feeding rates of Tellina using  $C^{14}$  labelled Phaeodactylum (A. Trevallion).
- i) Studies of herring larvae in the Clyde area, March to May, and on the Buchan and Shetland grounds and off the west coast of Scotland in September (A. Saville).

Programme for 1966

Work will be carried out on similar lines to the 1965 programme. The general plankton sampling will be over as wide an area as possible in the northern North Sea and in Scottish waters. Herring larvae will be studied in the northern North Sea in September.

Edinburgh

The staff of the Oceanographic Laboratory, Edinburgh, continued their long-term studies of the ecology of the plankton of the North Atlantic and the North Sea. The programme was aided by the Natural Environment Research Council and by Contract N62558-3612 between the Scottish Marine Biological Association and the Office of Naval Research, Department of the U.S. Navy. Plankton recorders were towed for 112,000 miles during the year by 20 merchant ships, 7 European weatherships and 9 U.S. Coast Guard Cutters. The research programme fell into three main sub-divisions: (a) biogeography (b) the analysis of variation in the plankton and (c) studies of intra-specific populations.



During the year, encouraging progress was made in the design of an oceanographic recorder which will undulate vertically in the upper 50 or 100 metres as it is towed at normal cruising speeds. It is planned to incorporate sensors for physical variables in addition to sampling the plankton.

The programme of research on the relationships between the plankton and the herring (started in 1948) was continued off the north-east coast of Scotland. The year was remarkable for the scarcity of a great many of the plankton organisms which usually characterize this area.

U.S.S.R.

(K.N. Nesis)

In 1965, the Polar Institute carried out investigations on the abundance, composition and distribution of zoo- and phytoplankton in the Norwegian Sea, zoo- and macro-plankton in the Barents Sea and in the Spitsbergen and Bear Island area. Investigations covered the southern and south-western parts of the Barents Sea, the area off north-western Norway, the central and southern parts of the Norwegian Sea and the area of West Spitsbergen and Bear Island.

In the Barents Sea (sub-area I) 739 samples of zooplankton were taken on 3 cruises and 748 samples of euphausiids on 7 cruises. In the Norwegian Sea 1760 zooplankton samples were collected on 9 cruises and 224 samples of phytoplankton on 2 cruises.

In 1966, the programme of zooplankton investigations in the southern part of the Barents Sea and off the north-west coast of Norway is considerably curtailed. Zooplankton will be gathered from only a small number of stations in the southern part of the Barents Sea. The programme of the euphausiid investigations in the southern part of the Barents Sea and in Division I A as well as that of the phyto- and zooplankton studies in the central and southern parts of the Norwegian Sea remain unchanged.