

Not to be quoted without reference to the writer

R.V. ERNEST HOLT

Report of Cruise 7/68

Staff: B. W. Jones (16 August - 8 September) Duration: 16 August -
N. Reynolds 14 September
A. D. Clayden }
T. C. Doddington } 16 August - 13 September
B. K. Clarke }
A. J. Jones }
P. D. Wallace (13-14 September) All times G.M.T.

Aims:

1. To participate in the international survey of 0-group fish in the north-east Arctic.
2. To continue the development of echo survey techniques, particularly the estimation of target strength of individual fish.
3. To use the expendable bathythermograph system at the synoptic hours and radio the results to the laboratory daily.
4. To obtain core samples of the bottom sediment for Dr. P. G. W. Jones.
5. To continue investigations on the flagellate flora of the Barents Sea.
6. To undertake a tin-townet survey off Whitby for herring larvae.

Narrative

ERNEST HOLT sailed from Grimsby on the morning tide of 16 August and made a good passage direct to Tromsø arriving on the afternoon of 20th. The modified Boothbay net was calibrated on passage. After taking fuel and water the ship left Tromsø for Murmansk arriving in the early hours of 24th. Here ERNEST HOLT joined the other four ships participating in the international survey:

AKLDELIK KWIPOVITCH } U.S.S.R. JOHAN HJORT } Norway
FRITJOF NANSEN } G.O. SARS }

The final plans for the survey were made at a conference of the senior scientists in Murmansk. ERNEST HOLT sailed from Murmansk during the night of 24/25 August to commence her section of the survey.

ERNEST HOLT covered her part of the survey grid according to plan, but because G.O. SARS had experienced some delays it was agreed that ERNEST HOLT should work one of the G.O. SARS hydrographic sections. The ship returned to Tromsø on 7 September at the completion of the survey to take oil and water. Mr. Jones left the ship in Tromsø to work with the Norwegian scientists in analysing the results obtained by the English and Norwegian vessels. The U.S.S.R. participants were unable to attend this meeting.

ERNEST HOLT left Tromsø on the afternoon of 8 September and made a good passage south, arriving in the River Tyne at 1600 hours/12th where the pilot cutter brought Mr. Wallace out to the ship and landed Mr. Clayden and Mr. Doddington. The ship then proceeded to work the grid of Tin-townet stations which was completed by 1500 hrs on 14th. The ship docked at Grimsby on the evening tide of 14th.

Results

1. 0-group fish survey. The distribution and abundance of pelagic scattering layers was estimated from the echo-sounder paper records, and mid-water trawl hauls were made to identify the organisms present in the layers. The modified Boothbay net appeared to work well until lost due to the fracture of a swivel. After the first calibration trials no success was achieved in obtaining a satisfactory signal from the Acoustic Link; the reason for this is not known. Failure of the centre drums of the main winch meant that all the trawls and also the corer had to be worked from the warps on the main drums resulting in a certain amount of time being wasted changing the rig for the different gears.

The results of the full survey will be published elsewhere, but first impressions are that 0-group cod, haddock, saithe and herring were again very scarce. 0-group redfish were less abundant than in the previous year. 0-group capelin and also capelin of older age-groups were very abundant and widespread. The distribution of 0-group fish showed a clear relationship to the distribution of isotherms at 50 m depth.

Six hydrographic sections were worked including one of G.O. SARS sections which the ERNEST HOLT worked because delays had resulted in the G.O. SARS being short of time.

2. Development of echo survey techniques. This work was rather limited due to lack of time. Target strength measurements of the pelagic scattering layer were made using the ultra-violet oscillograph. The opportunity did not arise to use the high power 100 KHz sounder.

3. The expendable bathythermograph system. This was used successfully to provide temperature profiles at the synoptic hours and at the positions of the deeper stations along the West Bear Island Section. The equipment worked well and a satisfactory trace was obtained on every occasion. Results were coded and sent by radio to the laboratory.

4. Core samples. 10 core samples were obtained for Dr. P.G.W. Jones from the area between northern Norway and Spitsbergen and from the shelf west of Spitsbergen.

5. Flagellate studies. 79 samples were collected from the surface waters while the ship was in motion. Counts were made, on the Coulter counter, of particles whose volumes correspond to spheres of 3-5 μ , 5-8 μ , 8-12 μ and over 12 μ in diameter. Seven culture experiments, each of approximately four days duration, were run to determine the relative amounts of silt and algal cells in the suspended matter.

Samples of seawater were placed in conical flasks, enriched with nutrients and incubated in the refrigerated illuminated cabinet.

In waters well away from land counts were low, usually 1,000-1,500 particles per ml. Near the coasts of Norway and Spitsbergen the counts rose to 3-4,000 per ml. In all cases the 3-5 μ group was by far the most numerous.

The culture experiments indicated that the great majority of the suspended particles were viable algal cells, and that the silt fraction was negligible.

Good growth was obtained in several of the culture flasks by the end of the cruise.

6. North-east coast herring larva survey. A grid of 43 stations in the area between the Tyne and the Humber was completed successfully.

7. Miscellaneous.

(a) The West Bear Island Section was worked using towed electrodes and bathythermograph or expendable bathythermograph.

(b) Two bottom trawl hauls were made, one north-east of Bear Island and the other West of Spitsbergen. The catches were 12 and 15 baskets of codling respectively of a one hour tow. A sample of otoliths was taken and stomach contents recorded.

(c) Flesh samples from 20 cod were taken for a comparative study of sarcoplasmic proteins.

(d) Weather observations were made at the synoptic hours.

(e) Target strength measurements of a standard target were made with the 100 KHz sounder.

B.W. JONES
15.9.68.

Seen in draft: D.J. Garrod

James Balfour (Master)

Distribution

Basic List, plus the following:-

B.W. Jones
N. Reynolds
A.D. Clayden
B.K. Clarke
T.C. Doddington
A.J. Jones
P.D. Wallace