

G e a r a n d B e h a v i o u r C o m m i t t e e

By STEINAR OLSEN

1967

Belgium

(P. Hovart)



The activity during 1967

- Standardisation of net materials and netting
- Comparative tests of netting yarns and netting in collaboration with the I.S.O. working groups I.S.O./TC 38/SC 9/WG1
- Comparative fishing experiments with a shrimp trawl with sieve and an ordinary shrimp beam trawl, each trawl with an 8 m boom
- Tests in the Silver Pit with a pelagic trawl equipped with a wireless echo-sounder of Japanese construction.

Programme for 1968

- Standardisation of net materials and netting
- International collaboration with the I.S.O. working groups for standardisation of tests of netting yarns and netting
- Comparative fishing experiments with shrimp beam nets with and without sieve
- Selectivity experiments with shrimp nets.

France

(G. Kurc)

Technologie des chaluts

Les travaux ont porté principalement sur une étude générale des facteurs influençant l'équilibre du train de pêche en chalutages et sur des essais de maquettes de chaluts de types divers.

L'étude de l'équilibre du train de pêche est basée en particulier sur des données précisant les caractéristiques des panneaux et des filets, en relation avec la force motrice des chalutiers de Boulogne, Etaples et Gravelines.

Les essais de maquettes d'engins de pêche (chalut de fond, semi-pélagiques et pélagiques) ont été faits dans un nouveau bassin spécialement conçu pour cet usage et dont les caractéristiques sont les suivantes: type à circuit fermé, 21 m de long, veine d'étude de 2 x 1,50 m de section, vitesse du courant d'eau réglable de 0 à 1 m/sec.

Sélectivité

Deux expériences de sélectivité ont été faites à bord de la "Thalassa": l'une en juin dans le Golfe de Gascogne et sur la côte ibérique pour le merlu, l'autre en septembre en mer du Nord pour la morue, le merlan et la limande. Un rapport sur la première expérience a été donné en 1967.

Pêche électrique

Une étude des possibilité de pêche des espèces pélagiques par électrotaxie anodique puis pompage est en cours. L'étude théorique a été faite et des expériences de laboratoire sur modèles réduits ont permis de définir un certain nombre de paramètres. L'expérimentation pratique est prévue dans un proche avenir.

Comportement

Les réactions des clupéidés et de quelques autres poissons à la lumière incandescente ayant été étudiées de nouvelles recherches ont été entreprises au moyen de lampes fluorescentes et à vapeur de mercure.

Les premiers résultats montrent que le coefficient d'extinction étant le plus faible pour des lumières dont la longueur d'onde est comprise entre 4,500 et 5,500 A, l'effet de piège de lampes émettant une telle lumière se fait sentir à une distance plus grande que pour les lampes à incandescence.

Germany

(A. von Brandt)

Fishing Gear Investigations

Investigations in mid-water trawling have been continued with factory and freezer sterntrawlers. Successful catches, not only herring, have been made with pelagic trawls with an opening height of 35 m and a width of 40 m. Otter boards of 12.5 m² have been used.

Selectivity Experiments

In 1967 no trawl experiments have been made in the northern area. On the other hand trawling for hake off the coast of South-west and South Africa gave interesting results on the influence of catch-size on the selectivity factor.

Net Materials

The cod-ends used by sterntrawlers are made of polyamide fibres. Cod-ends for side trawlers are made of polyamides (80%) or polyethylenes (20%). For side trawlers sometimes some parts of the underbelly are made of polypropylene split fibre.

The discussions for standardisation of net materials and netting have been continued on national and international level. A special testing group has been established.

Fish Behaviour

The reactions of the Atlanto-Scandian herring in respect to mid-water trawl were studied by means of different echo-devices. During its wintering period east of Iceland the herring could be easily caught, but during the spawning migration and off the Norwegian coast fish were so skittish that very seldom successful hauls were made.

Norway

(Steinar Olsen)

Selectivity

No selectivity work was conducted in 1967.

Fish Behaviour

Planning and construction design was started of the auxiliary equipment and mechanical devices required for full utilisation of the 15 m circular tank available at the Institute of Marine Research, Bergen. When completed this tank will greatly increase the facilities for experimental fish behaviour work, and it is hoped that these facilities will also be used by scientists from other countries.

Aquarium experiments on hearing in fish were continued. Especially the question of directional sound perception was studied, and preliminary results indicate that in cod such an ability does exist for stimulus frequencies below 400 Hz.

These studies are part of an overall long-term programme to investigate the importance of noise in fishing gear and vessel design.

Acoustics

Further observations were made and data collected, in February and March on the Lofoten banks and in August at the Finmark coast, regarding target strength and trace patterns of cod and saithe, to investigate possible species differences in these characteristics which may become useful for acoustic counting, sizing and identification. Preliminary results suggest that there are significant differences between the trace patterns of cod and saithe.

Sweden

(G. Otterlind)

Some investigations concerning large-meshed cod-ends in cod trawls have been carried out in the Baltic (mesh-size 85-90 mm) and also some experiments with one boat pelagic trawl.

As to net material for trawls etc. there is no change compared with the report of last year. The development continues towards larger mesh-size in the anterior part of pelagic trawls. By now the maximal mesh-size of large Swedish trawls is about 700 mm (bar length 360 mm); close to the headline floats the meshes are smaller. An UW-TV is now in use on our research vessels, especially for behaviour studies.

United Kingdom

1. England & Wales

(A.R. Margetts)

The last in the recent series of parallel-towing comparative fishing experiments, using the distant-water research vessels of the Aberdeen and Lowestoft laboratories, was made in the Barents Sea in November. It compared that standard Granton trawl with a higher-headline trawl fitted with long double bridles and curved otter-boards. In darkness the Granton trawl was consistently more efficient. The absence of any important ship/gear interaction with these gears under the particular conditions was demonstrated by fishing identical gears from the two ships at the same time.

Scuba divers made observations on the action of a half-size pelagic trawl rigged with a forward projecting underlip to the net.

The new research vessel "Corella" was fitted temporarily for purse-seining and shown to be capable of this method of fishing.

A cod-end mesh selection experiment made from R.V. "Ernest Holt" in the Barents Sea showed different selectivities for the two different twine forms (Nufil and Ulstron) of polypropylene: a similar experiment at Newfoundland from a commercial trawler gave a different result, showing similar selectivities for the two twines.

A test of the "Polish type" topside cod-end chafer from R.V. "Ernest Holt" showed that the cod-end selectivity was not reduced by the chafer. A test of a "mesh for mesh" double cod-end type of chafer on a commercial trawler showed that it reduced the selection factor on cod from 4.3 to 3.8.

Development of an unmanned steerable towed body to house ciné and television cameras and of an acoustic arch trawl headline scanning system continued.

A device for measuring the speed and distance travelled of a beam trawl was developed in a form recording at the ship via the acoustic telemetry link.

A fish echo-signal integration system was used in conjunction with a high-powered echo-sounder to count fish within the two metres above the sea-bed. This gave most encouraging results both off South Africa and in the Barents Sea. An associated means of differentiating between single fish and shoals also gave good results.

A standard survey echo equipment, operating on 100 kHz, was used from the research vessels "Ernest Holt", "Clione" and "Corella". The high resolution of

these equipments discerned detail of echo-layer structure and proved particularly useful in the Barents Sea where dense echo-layers were encountered near the surface. The digital counter was used with this equipment for counting sprat. A very high powered 100 KHz equipment was developed.

The fitting of ship-borne sector-scanning sonar on R.V. "Clione" was commenced.

2. Scotland

(J.A. Pope)

The broad, integrated programme of research by Scotland in the fields of fishing gear technology, fish behaviour and echo-sounding, which has been in progress for some years now, continued during 1967.

A further comparative fishing experiment in the series devoted to studying the effect on catching efficiency of various aspects of the design and rigging of demersal trawls and aimed, in particular, at the development of a high-headline trawl of high catching efficiency, was carried out on "Explorer" working in collaboration with the English research vessel "Ernest Holt". In this experiment a Standard Granton trawl with 60 fathom sweeps and flat doors was compared with a high-headline trawl with 64 fathom bridles and large curved doors. The experiment was carried out off the North Coast of Norway.

During the year both "Mara" and "Clupea" were engaged in experiments with various designs of otter boards. Cambered, "V" type and standard boards of various sizes were used with standard nets and rigging, and comparisons of otter board spreads over a wide range of ground conditions were obtained.

Two small, single-boat mid-water trawls were tested. It was found possible to control these gears to fish from one fathom off the bottom up to the surface. A pelagic trawl was also designed for the purpose of catching blue whiting and fully instrumented trials of this gear were made.

In addition to actual experimental studies with fishing gears, considerable work has been done in preparing an on-line data logging system for recording and processing measurements on gear while in normal operation. This system will operate through a ship-borne digital computer which is expected to be installed on the F.R.S. "Explorer" late in 1968.

Further investigations of under-water visibility were made in Scottish coastal waters, particular attention being paid to the influence of slight changes in turbidity and surface light distribution. Significant effects on the distance at which grey targets could be seen were detected, a result of considerable relevance to the question of how far one fish might be able to see objects such as another fish or part of a fishing gear.

Experiments to produce conditioned responses of fish to sound stimuli in the frequency range 140-500 c/s were undertaken during 1967. Threshold intensities at different frequencies were estimated by this technique for specimens of lythe and saithe. The reaction of herring to a noise gradient was studied and it was found that herring tended to avoid the region nearest the sound source where the noise intensity gradient was greatest.

Detailed observations were made of the spawning behaviour of haddock in an aquarium. It was observed that the male and female paired prior to spawning and fertilisation and indulged in an elaborate courtship with the male emitting intense sounds. The two fish involved spawned repeatedly at intervals of about 26 hours over a period of 19 days. The average number of eggs shed by the female on these occasions was 12,000.

Work continued on the development of a high frequency narrow beam echo-sounder for fish counting and on a sector scanning sonar equipment for fish behaviour work.