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# CRUISE REPORT

## FRS "C L U P E A"

## 19 October-14 November 1970

### Objectives

1) To measure depth attenuation of sound at 400 KHz.

2) To carry out a survey of the Clyde herring stock using the fish echo counter and pelagic trawl.

### Narrative

Storm conditions, at the start of the cruise, delayed sailing for three days. A passage was then made to the Clyde, the depth attenuation work being done in the Firth of Lorne en route. The last two weeks of the cruise were marred by continuous gale or severe gale conditions which severely limited the areas which could be worked. The cruise finished at Greenock on the 12th November to allow the crew a long weekend break.

### Results

Measurements were made in the Firth of Lorne of the vertical attenuation of 400 KHz ultra sound. A mean value of 0.083 per metre was obtained, which is somewhat less than the generally accepted value. Since this figure may prove to vary in different plankton conditions it will be advisable to repeat the measurements in other seasons.

The fish echo counting apparatus worked well in as far as no electronic faults developed at any stage, and the control and inhibit circuits operated as designed. However, the overall stability of gain was not as good as it should have been and there was more interaction between the 300 KHz and 400 KHz systems than is desirable.

The major remaining problem in the use of this equipment for fish counting is the elimination of sea-bed echoes. On a reasonably smooth bottom the system can be made to work although initially on this cruise it was not satisfactory due to deficiencies in the time varied gain. The requirements are, however, so critical that it may be necessary to increase the present limit of 15 cms from the sea-bed. On irregular, "peaky" types of sea-bed automatic counting probably cannot be done successfully except by confining it to genuinely mid-water traces. In some cases heavy interference completely swamped the recordings. This appeared to be of acoustic, not electrical pick-up, origin. However, despite these defects a number of echo-counts were made which can be reduced to target strengths for comparison with the composition of mid-water trawl catches.

Very few traces, clearly attributable to herring, were seen and that there were no major herring concentrations in the area at that time was supported by the poor results obtained by the commercial fleet and the fact that they were widely scattered over the area. Due to the unfavourable weather which prevailed throughout the cruise only 13 hauls were made with the pelagic trawl and these were largely confined to the area to the west and north of Arran. The largest haul of herring was 250 per hour in the Mount Stewart

area; other hauls yielding fair quantities of herring were made around Skipness Buoy and in Loch Fyne. In all of these hauls adult herring were rare, the dominant constituent being fish with a modal size of about 15 cms.

Saithe, whiting and Trisopterus esmarkii were the main constituents of most of the catches with 0-group fish of all three species forming a high proportion of many of the catches. 0-group cod were also taken in two hauls on Skermorlie Bank and in Loch Long.

A Saville
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8 December 1970