WIRE-DRAG OPERATIONS IN GREENLAND (1959)

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In the inshore waters south of Godthåb, Greenland, a transit harbor for iron ore is being planned. This harbor, which is to be built on Rype Islet, must be navigable for ships of up to about 75 000 tons.

In order to be able to guarantee safe navigation for ships of this size, the Danish Hydrographic Service wire-dragged the approaches and channels leading to the harbor site to a depth of 45 feet at MLWS, followed by a very detailed survey, during the summer of 1959.

Gear

The wire drag used was made by the Royal Danish Navy according to USC & GS blueprints and specifications.

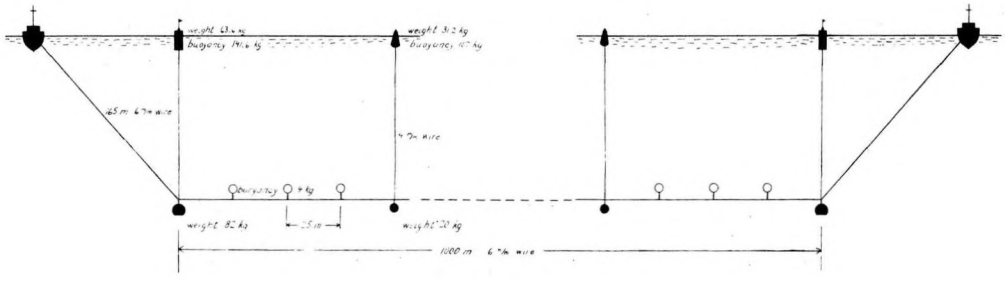

FIG. 1

The drag shown in fig. 1 consists of :

6-mm bottom wire		
6-mm towing wire		
4-mm uprights wire		
large buoys	weight :	63 kg
	buoyancy :	141 kg
small buoys	weight :	37 kg
	buoyancy :	107 kg
large weights		82 kg
small weights		20 kg
floats	buoyancy :	4 kg

The floats had a buoyancy calculated to support a little more than the weight of the bottom wire. These floats, similar to those used for fishing

gear, are made of plastic and constructed to withstand a pressure of 20 atmospheres.

Two cutters of 130 tons fitted with 180-HP engines and reversible propellers were used for towing the wire drag.

These vessels, built for fishery inspection, were in reality too strong for this kind of work, as the towing speed never could exceed 1-1 ½ knot. But the reversible propellers made it possible to obtain the required speed.

Platforms for attaching buoys and weights were built on the foredeck, where the winches were likewise placed.

Work

The dragged area which is shown on the chart is about 30 square nautical miles. 250 working hours during 24 days were spent to accomplish the actual dragging. In addition, a similar number of days were spent in establishing and determining trig. points, placing Raydist transmitters, on repairs, and last but not least with bad weather, so that a total of 2 months were necessary to finish the task.

For practical reasons the drag was divided equally between the two cutters, and in order to set it these started with their stems close together, while the bottom wire was connected and then went astern while paying out.

The bottom wire usually had a length of 1 000 m, the resulting drag strip being about 800 m as shown in fig. 2.

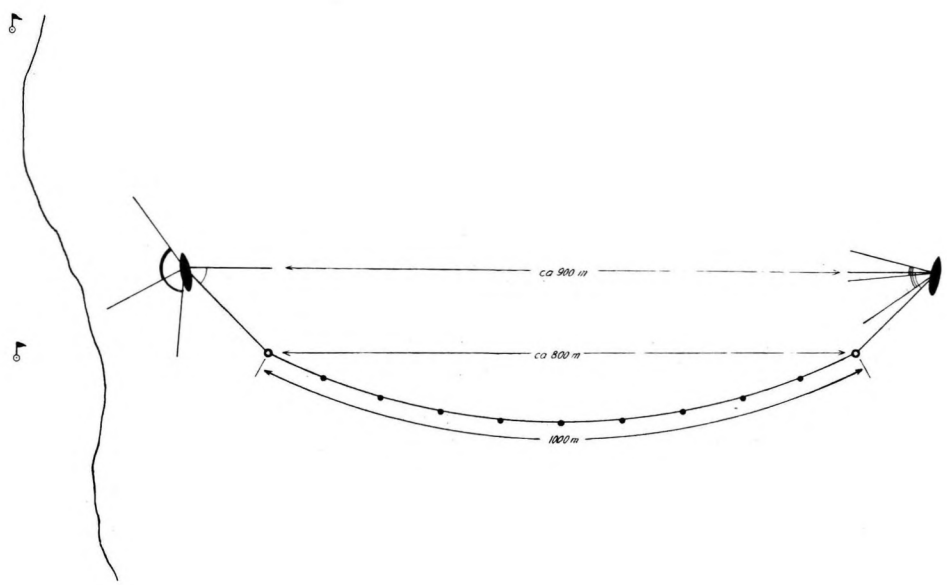

FIG. 3

Greater length of the bottom wire resulted in too much tension and made operation of the drag too difficult in the narrow channels.

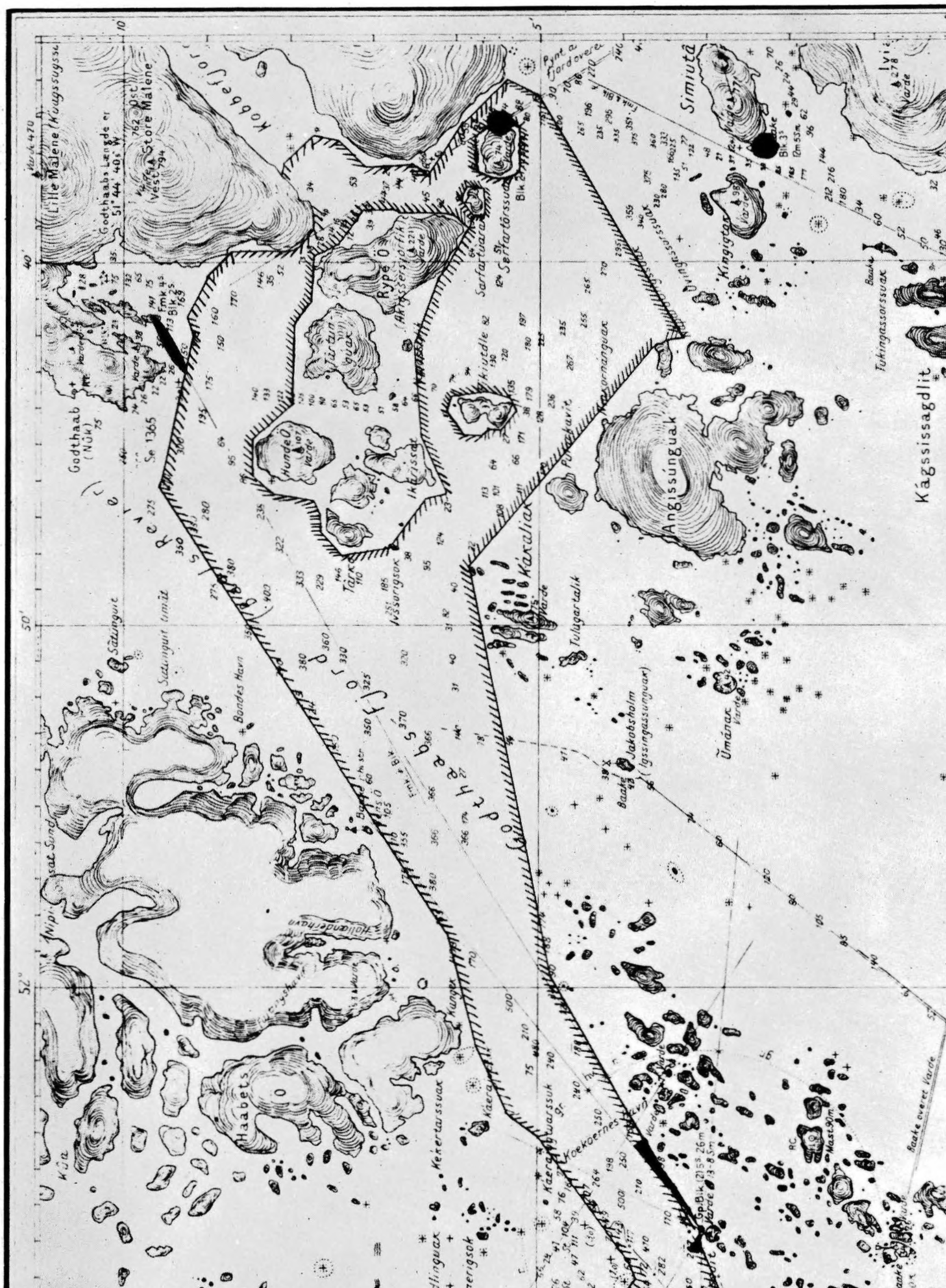

FIG. 3. — Limits of Wire-dragged Area.

Remarks

It had been feared that the existing heavy seaweed — kelp — might obstruct the dragging, but is was only necessary to stop operations in order to clean buoys and uprights a few times.

When the drag was working at the adjusted depth at the normal towing speed the lift was usually from 0.3 to 0.5 m, but lifts up to 1.0 m have been measured. Tide rips and swell, however, often complicated the testing.

The predominant difficulty was the strong tidal current, the speed of which was quite often greater than the towing speed, and dragging could only be done successfully by following the mean direction of the current.

The tidal current not only varied with the change of the tide, but its direction could usually not be determined on account of rocks and islands, and the backwash along the coasts was very annoying.

The greatest current speed measured was 3 knots; the normal maximum speed was about 2 knots at the peak of the tide.

As the strips were thus easily displaced on account of the behavior of the current, an overlap of about 50 per cent was necessary, bringing the dragged area up to 45 square nautical miles.

Fixing was done either by simultaneous angles in the two cutters or by simultaneous Raydist readings; the end buoy was fixed by observing the angle between it and the other cutter.

The rather hard work under adverse conditions resulted in the discovery of a few unsuspected shallows and rocks that would have been dangerous to shipping. Luckily these obstructions were found on the very edge of the proposed channel, but sufficed to show the value of wire-dragging in areas of great economic interest.