

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
 FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1978 RESEARCH VESSEL PROGRAMME

REPORT: RV CORELLA: CRUISE 8

STAFF:

D Harding

D Hughes

C Garrod

B Hampson

B Riches

DURATION:

Left Lowestoft 0900 h, 23 May

Arrived Lowestoft 1915 h, 4 June

LOCALITY:

West Central North Sea

AIMS:

1. To investigate the structure of plankton patches associated with the oceanic front in the west central North Sea.
2. To investigate the vertical distribution of planktonic organisms particularly fish larvae in (a) mixed water and (b) stratified water.
3. To investigate physical and chemical features of the water masses in the frontal zone.
4. To collect berried crabs (Cancer pagurus) for laboratory studies on the development of larvae.
5. To tag surplus and immature crabs and release in the area of capture.

NARRATIVE:

RV CORELLA sailed on schedule from Lowestoft at 0900 h, 23 May rigged to use (a) a 20" Lowestoft high speed plankton sampler for collecting fish larvae and (b) the ship's stainless steel pump to deliver water from three metres to environmental sensors mounted in the laboratory to measure temperature, salinity, pH, oxygen, transparency chlorophyll 'a' and particle size with the HIAC particle counter and provide samples of water for nutrient analysis. The instruments were calibrated as soon as the ship reached deep water and the first of a grid of plankton stations occupied at 20.36 h at 54°N 1°00'E. Work ceased at 0210 h, 24 May when the electronic instrumentation failed on the plankton sampler and the ship ran into the coast to effect repairs in deteriorating weather conditions. Work recommenced at 0756 h, 25 May after trials in Bridlington Bay proved the sampler to be functioning satisfactorily. At 2200 h, 27 May the Toroidal Buoy in Tees Bay was sighted some two miles west of its original position. The plankton grid was completed at 1535 h and the CORELLA returned to Tees Bay and recovered the buoy, two anchors, the acoustic release and one current meter at 1935 h the same day. Meanwhile, the changing net sampler was rigged and the ship moved down the coast to a station near a strong temperature front located

offshore near Whitby on the outward survey. Horizontal samples were collected at selected depths at midday and midnight and light measurements and water bottle casts made between these hauls on 28 and 29 May to study the vertical distribution of larval fish. At each station a parachute drogue was deployed to locate the water mass to be sampled over the 12 hour period. On completion CORELLA sailed to Sunderland to take on fresh water and docked at 0700 h, 29 May. Whilst in Sunderland several items of equipment were serviced, the instruments recalibrated and an unencased 20" high speed plankton sampler rigged with a hose attached to the cod end of the net through which water and plankton could be pumped to the surface. Work commenced at 0815 h, 30 May, extending along the coast between Sunderland and Whitby and using the pump to collect plankton and water samples from 20 metres depth and the ships pump and environmental system to monitor water at 3 metres depth. This work was completed at 1013 h, 1 June and light measurements were then made using the Q.S.M. spectral radiometer filled with new electronic filters while the encased plankton sampler was rigged for under way survey with depth, temperature and oxygen sensors ready for the final series of transects through the frontal system east of Flamborough Head. This work commenced at 14.44 h, 1 June and ended at 1559 h, 2 June. The ship was then prepared for trawling and the Granton trawl rigged. Hauls were made on the Flamborough Off Ground, Well Bank, Coal Pit, Outer Dowsing and Cromer Knoll between 3 and 4 June. Trawling was completed at 1405 h, 4 June and the ship then sailed for Lowestoft.

RV CORELLA docked at Lowestoft at 1915 h, 4 June, having completed all the objectives set out in the cruise programme apart from tagging crabs which were in very short supply.

RESULTS

Preliminary plots of temperature on the outward grid (Fig. 1) indicated a frontal system developing at $54^{\circ}40'N$ from the coast at Redcar in Tees Bay to $1^{\circ}E$ and a second front at $5^{\circ}10'N$ from the coast to $0^{\circ}30'W$, the offshore limit of the grid. These two fronts are probably continuous further offshore. Mixed water occurred inshore along the coast and in the shallow water to the south of an east-west line drawn at $54^{\circ}20'N$. Transects across the temperature front showed alternating cells of cold and warm water with associated high and low chlorophyll 'A' values and particle counts and particularly high chlorophyll 'a' values associated with the main temperature discontinuity (Fig. 2), a complex system brought about by the recent calm hot weather and low wind velocity. The inward grid completed in calm, hot, sunny conditions showed intensification of thermal stratification near the surface, particularly at inshore stations, resulting in a complete change in the surface (3m) water characteristics on this survey. The water masses were still more strongly stratified offshore and mixed inshore and south of Flamborough Head, but inshore stations also showed strong thermoclines very near the surface, thus indicating the intensity of the surface heating.

The changing net worked well and four good series of samples were obtained although there seemed to be a dearth of larval fish in the samples.

Pumping from depth also worked well from 20 metres and gave good samples of plankton including fish larvae but the rig was unwieldy to handle and was not suitable for vertical distribution sampling.

Trawling for crabs was not very successful, although seven live specimens were obtained out of a total of twelve landed from seven one hour hauls on different grounds.

Some other method of sampling crabs in deep water and on rough ground offshore will have to be tried if large numbers are required for tagging or stock assessment.

Four live berried female crabs were returned to Lowestoft for the laboratory experiments indicated.

D Harding
12 June 1978

Seen in draft: JEMB
RCN

INITIALLED: AJL

DISTRIBUTION:

Basic List

D Harding
D Hughes
C Garrod
B Hampson
B Riches

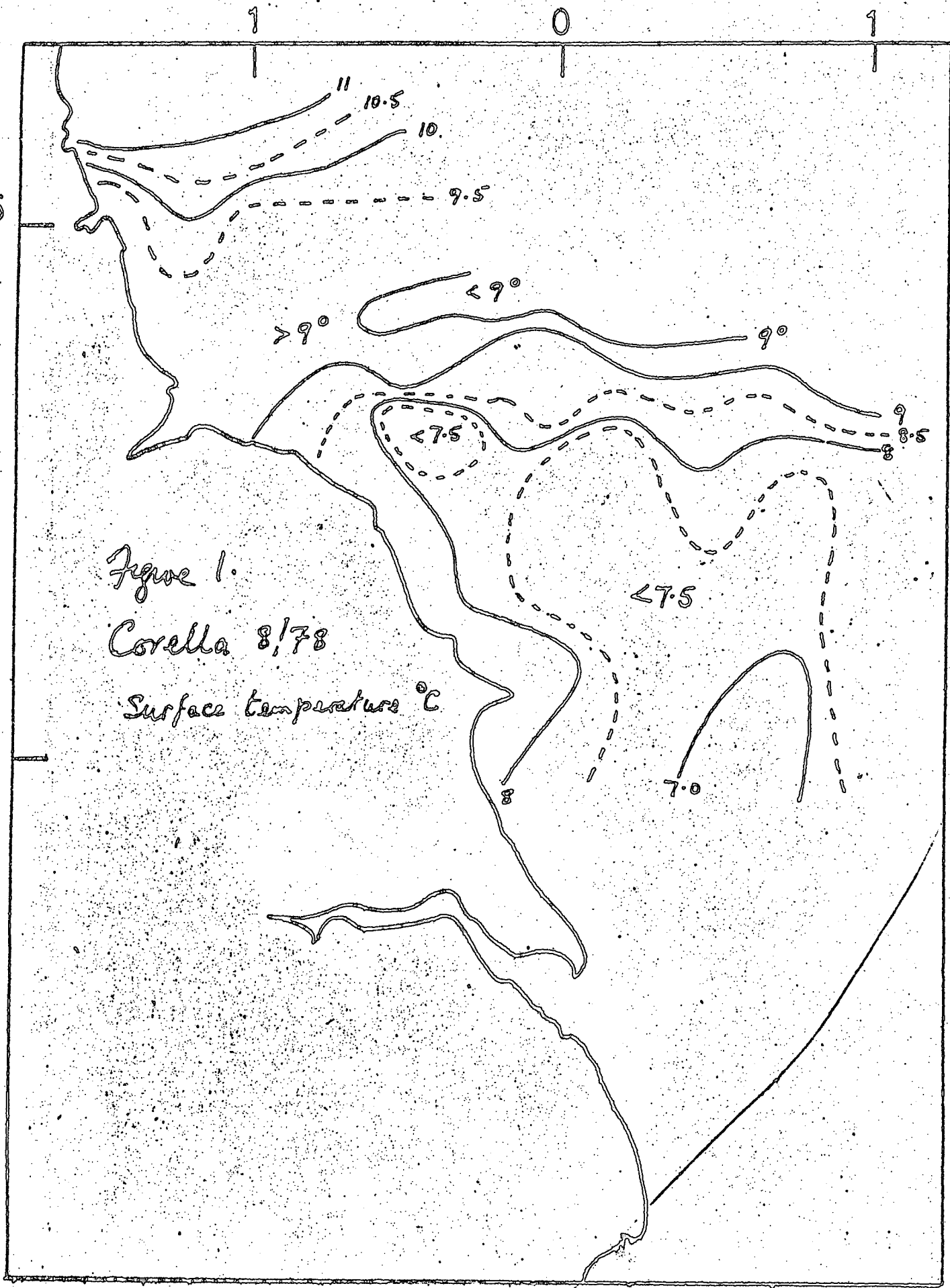


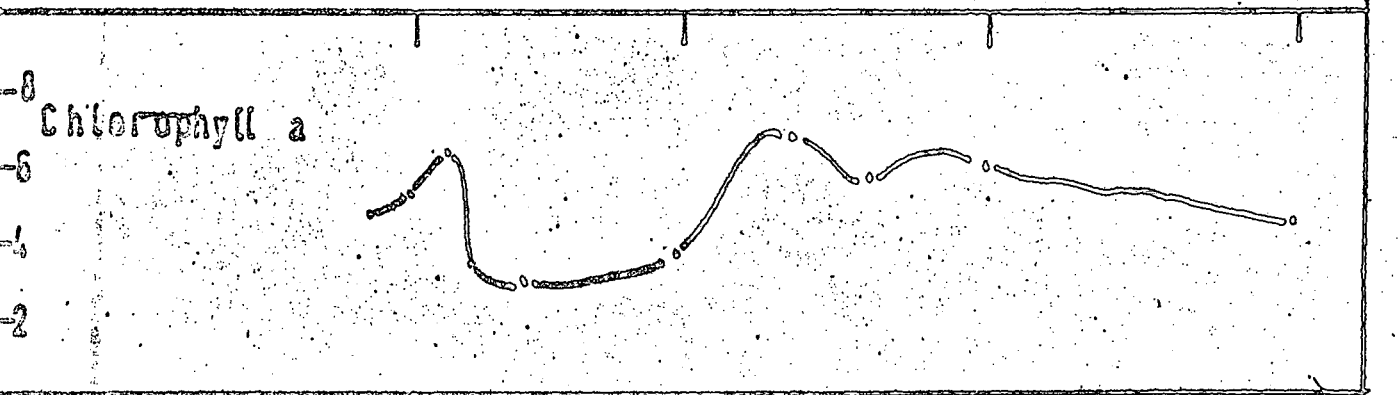
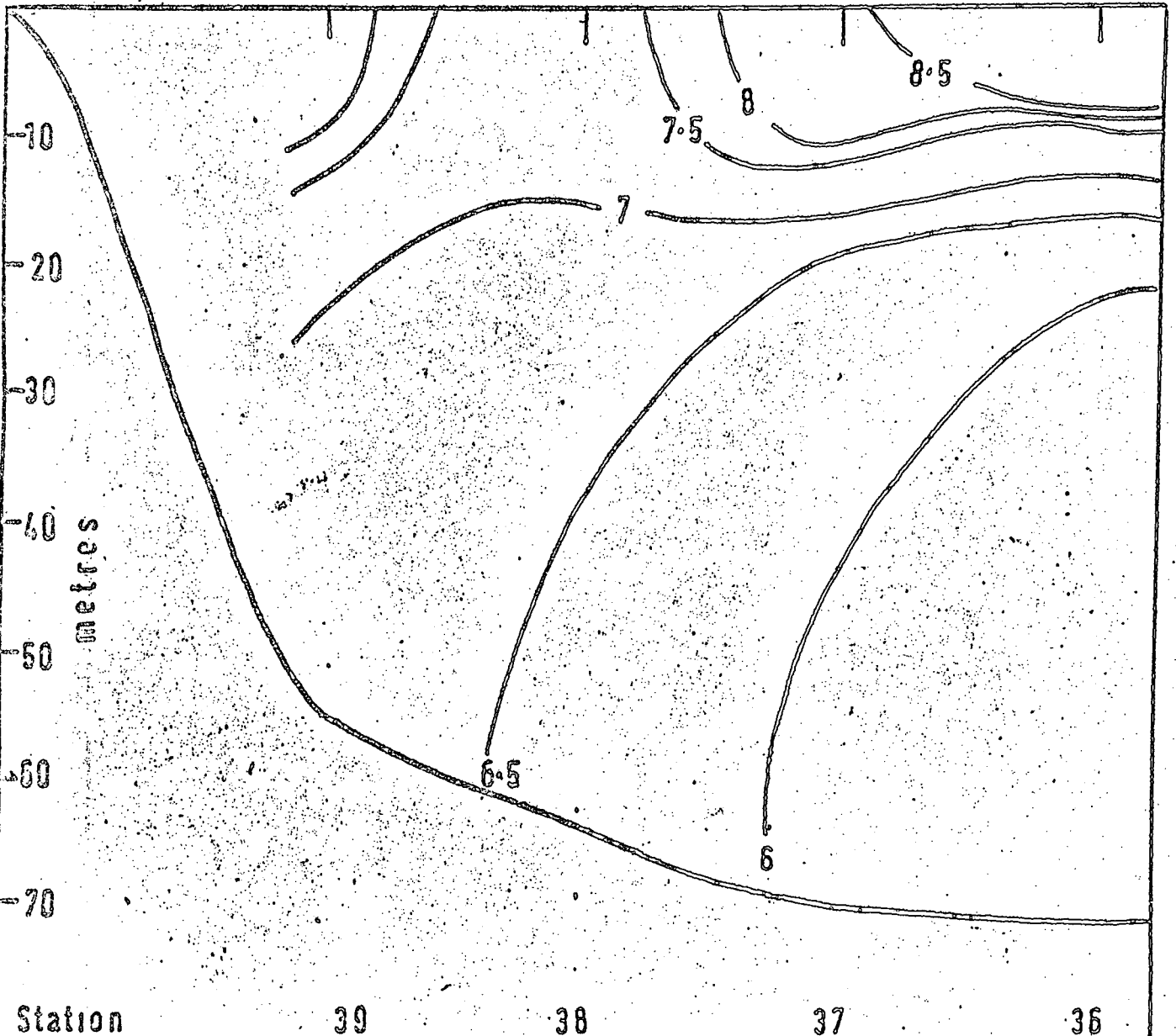
Figure 1.
Corella 8/78
Surface temperature °C

Figure 2.

TEMPERATURE SECTION

mixed coastal front stratified

High production

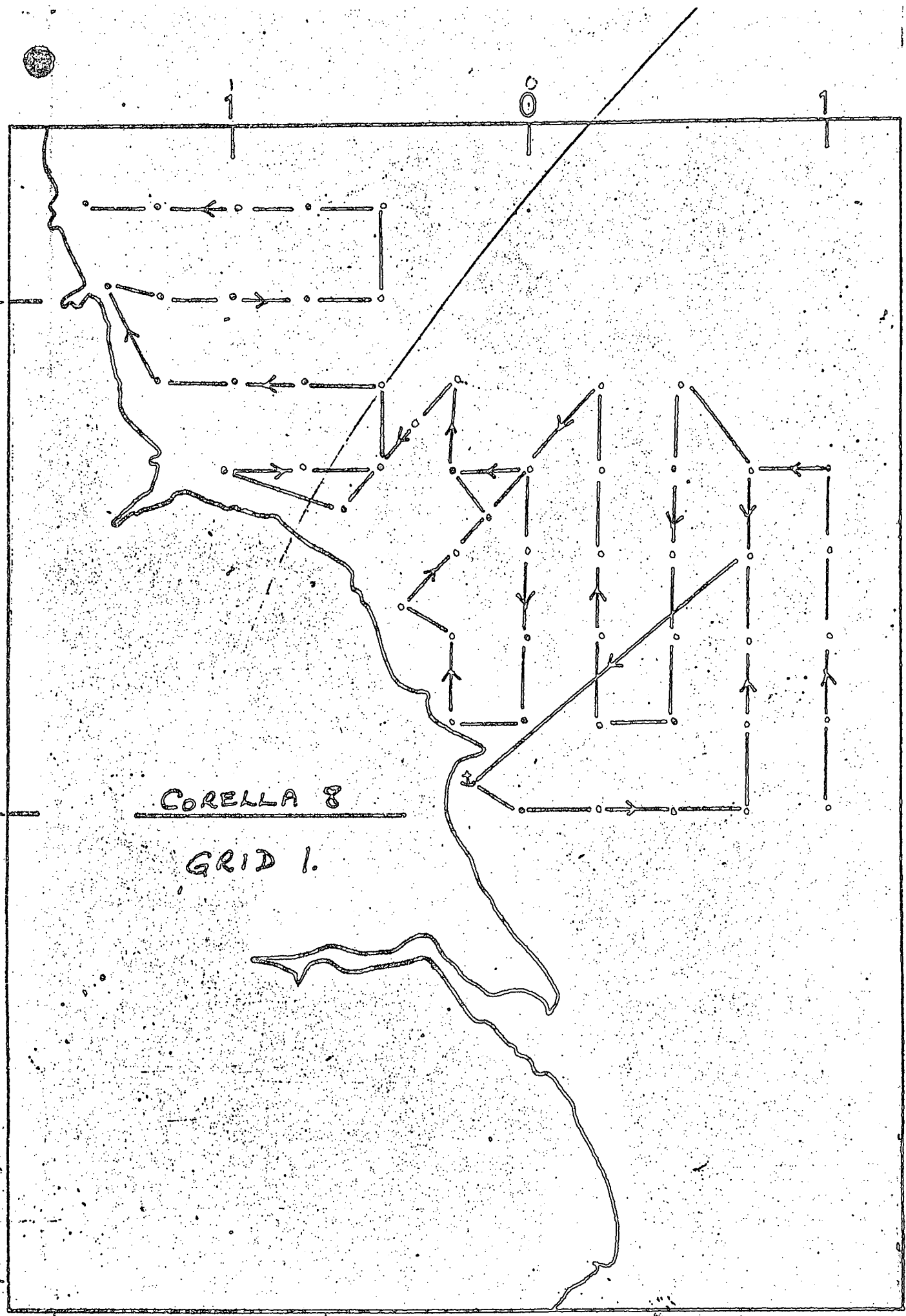


5

4

CORELLA 8

GRID 1.



1

0

1

55

54

CORELLA 8
GRIDSZ. A AND B

