Met.O. 870

The Marine Observer

A quarterly journal of Maritime Meteorology

Volume XLIV No. 244

April 1974

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Marine Observer's Handbook

This illustrated book deals with meteorological instruments and the practical aspect of making observations. It is designed to assist officers who voluntarily make observations on behalf of the Meteorological Office, to encourage mariners to take an interest in meteorology, and to provide a book of reference for candidates for the Masters' and Mates' examinations. Chapters on artificial satellites and research rockets are included.

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THE MARINE OBSERVER

A QUARTERLY JOURNAL OF MARITIME METEOROLOGY PREPARED BY THE MARINE DIVISION OF THE METEOROLOGICAL OFFICE

VOL. XLIV No. 244 APRIL 1974

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Report of Work for 1973

(MARINE DIVISION OF THE METEOROLOGICAL OFFICE: VOLUNTARY OBSERVING FLEET AND OCEAN WEATHER SHIPS)

1. Voluntary Observing Ships

At the end of the year the British Voluntary Observing Fleet was comprised as follows:

(*a*) 531 Selected Ships, including 5 trawlers, which are supplied with a full set of meteorological instruments on loan and which make observations in code every six hours and transmit them to the appropriate coastal radio station wherever their voyages take them.

(*b*) 49 Supplementary Ships, including 16 trawlers, which make less detailed observations than Selected Ships and are supplied on loan with only a barometer, air thermometer and screen. They use an abbreviated code for their messages.

(*c*) 49 coasting ('Marid') vessels which make sea-surface temperature observations in U.K. coastal waters and transmit them in a special code by W/T or R/T. When in the North Sea, the coasting ships include in their messages wind, weather and visibility observations.

(*d*) 14 light-vessels and 1 light-tower which make observations of wind, waves, visibility, air and sea temperatures; all of these send coded reports by R/T. Reports from the Royal Sovereign light-tower and the *Galloper*, *Dowsing* and *Varne* light-vessels are included in the BBC weather bulletins for shipping and all four report barometric pressure, using the precision aneroid. The first two also report barometric tendency.

(*e*) 12 trawlers which make non-instrumental observations only and transmit them by W/T or R/T, using an abbreviated code, to radio stations in the U.K., Canada, Iceland, Norway or U.S.S.R. depending on the area in which they are fishing. In addition to these, 5 trawlers now figure in the Selected Ships' List and 16 in the Supplementary Ships' List.

(*f*) 17 Auxiliary Ships which make and transmit visual observations similar to those made by trawlers, with the addition of pressure and air temperature readings from the ships' own instruments (using the 'Shred' code). These ships do this work only when in areas where shipping is known to be sparse.

Throughout the year, the number of recruitments of Selected Ships has almost balanced the considerable wastage due to ships being sold or broken up. Whilst on paper the numerical strength of the Voluntary Observing Fleet has not grown, observations received have nevertheless increased since the larger container and bulk-carrier type vessels spend more time at sea than their predecessors, and are therefore able to make a greater contribution of observations. In spite of retirements and consequent changes in personnel the Port Meteorological Office staffs have continued diligently their recruitment and general liaison work, of mutual benefit, between the Meteorological Office and shipping interests, bearing in mind that apart from the special purpose Ocean Weather Ships meteorological work at sea in British merchant ships has always been carried out on a voluntary basis.

The policy of automation of marine meteorological instruments has continued and several newly-built ships have been fitted with this equipment, which helps to lighten the tasks of observing officers. Shipowners approached in this connection have all proved very co-operative, in some cases the initiative coming from the shipowners themselves, a situation which favourably reflects the relations between the Meteorological Office and the shipping industry through the medium of the Port Meteorological Officers.

The British Voluntary Observing Fleet includes ships of many shipping companies and Table 1 shows the variety of trade routes on which they are engaged.

Table 1. Average numbers of British Selected and Supplementary Ships on main trade routes to and from the U.K.

Europe	52	West Indies	33
Australasia	69	South America	23
Far East	84	Pacific Coast of North America	11
Persian Gulf	33	Falkland Islands and Antarctic	3
South Africa	31	World-wide 'tramping'	123
West Africa	20	Near and distant-water fishing grounds	21
North Atlantic	77		

Acknowledgement should once again be made of the valuable service rendered by many Commonwealth and foreign Port Meteorological Officers for their services in replacement of defective instruments in U.K. Selected Ships on protracted voyages, and withdrawal of instruments from British vessels which have been sold to foreign interests.

During two typical days, one in June and one in November, the total number of reports from ships received in the Central Forecasting Office at Bracknell from various sources is shown in Table 2.

Table 2. Total number of reports received at Bracknell by various sources from ships during two typical days in 1973

	JUNE	*NOVEMBER*
Direct reception from		
British ships in eastern North Atlantic	150	204
Foreign ships in eastern North Atlantic	55	9
British ships in North Sea	28	31
Foreign ships in North Sea	45	1
British ships in other waters	0	7
	278	252
Via other European countries		
Ships in eastern North Atlantic	257	342
Ships in Mediterranean	77	24
Ships in North Sea	123	109
Ships in Pacific	5	3
Ships off northern Russia	23	6
Ships in other waters	29	6
	514	490
Via North America		
Ships in North Atlantic	582	649
Ships in North Pacific	733	831
Ships in other waters	52	75
	1367	1555

2. Ocean Weather Ships

During the year the British Weather Ships completed 26 years of service in the North Atlantic. The present four ships, ex 'Castle' class frigates built for the Royal Navy in 1944, have now been operating as weather ships for about 14 years and still

give reasonably satisfactory service, though now showing signs of their age. They co-operated with the two French ships and the Dutch ship *Cumulus* in operating Station 'Alfa' on a part-time basis throughout the year and Stations 'India' and 'Juliett' continuously. The operation of Station 'Kilo' was shared by the two French ships and the Dutch ship *Cumulus*. Station Mike was operated continuously by the two Norwegian ships, though stations on the western side of the North Atlantic, operated by the U.S. Coast Guard, are in process of withdrawal for budgetary reasons. The rules and regulations governing the equipment and the operation of the weather ships are made by the International Civil Aviation Organization supported by the World Meteorological Organization.

All ships make hourly surface and six-hourly upper-air observations. The following additional observations were regularly made by British Weather Ships: solar radiation and radiation balance, sea temperature and salinity down to a considerable depth, magnetic variation and surface sea-water sampling. The biological sampling programme for the Institute for Marine Environmental Research was continued throughout the year with the use of the Longhurst/Hardy plankton recorder to determine the vertical distribution of plankton in upper 500 metres of the ocean at Station 'India'. For this duty a marine biologist from the Institute made several voyages to the Station. In association with this investigation, water samples for phytoplankton analysis were taken and extra net hauls for analysis of toxic residues in the plankton were made.

Communications and navigational facilities were provided for transatlantic aircraft by all the British Weather Ships and air/sea rescue equipment was kept in a constant state of readiness. Search and rescue exercises were frequently carried out in which RAF Nimrod aircraft sometimes participated.

3. General

For the greater part of the year meteorologists aboard two vessels of the Sugar Line continued to make radiosonde soundings as part of the World Weather Watch (WWW) programme and we are much indebted to the Sugar Line Management for the help and co-operation they gave. Unfortunately the radiosonde aspect of the WWW programme for merchant ships did not develop as anticipated and the U.K. has decided to withdraw these two participating ships.

The Marine Division continued to co-operate closely with the Central Forecasting Office in the weather routeing of ships in the North Atlantic and North Pacific Oceans.

4. Inquiries

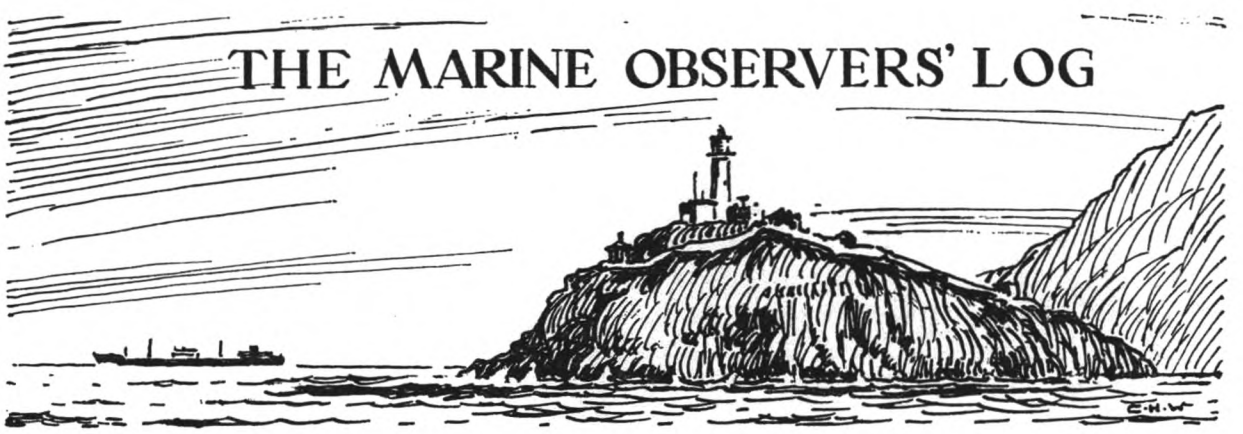
In addition to a record number of inquiries concerning 'normal' shipping hazards—groundings, cargo damage and delays—the Inquiry Section dealt with many related topics. Advice and help was given for, amongst others, a WMO inquiry into the unusual long-lasting variations in the El Niño (Holy Child Current) of the eastern Pacific, locusts off West Africa, the possibility of crossing the Irish Sea by canoe, sea temperatures for holiday brochures, details of weather for authors of ships' histories and whether it was possible for an American Red-legged Buzzard to have been blown across the Atlantic in the autumn of 1850. In dealing with the latter inquiry reference was made to the old log of the *Princess Royal* (Captain G. A. Lewis). This is a masterpiece of penmanship without any water damage despite entries such as: "October 6, midnight. Fresh Gale. Ship labouring very heavily and taking great quantities of water on deck. Cabins knee-deep in water".

5. Awards to Voluntary Observing Ships

In recognition and appreciation of their contribution to international meteorology,

the customary practice was continued of awarding books to the masters, principal observing officers and senior radio officers of the hundred ships which had sent in during the year the most carefully-kept meteorological logbooks. Similar awards were made to masters and officers of vessels on the short sea trades ('Marid' ships) for their contribution in making sea-temperature observations and to trawler skippers and radio officers who had the best records in making and sending non-instrumental observations from the fishing regions. Additionally, barographs were again presented to shipmasters whose observations over many years have consistently achieved high standards of excellence.

The books selected for awards were *Cassell's English Dictionary*, *The Wreck Detectives* by Kendall McDonald and *The University Atlas*.



April, May, June

The Marine Observers' Log is a quarterly selection of observations of interest and value. The observations are derived from the logbooks of marine observers and from individual manuscripts. Responsibility for each observation rests with the contributor.

Observing officers are reminded that preserved samples of discoloured water, luminescent water, etc. considerably enhance the value of such an observation. Port Meteorological Officers in the U.K. will supply bottles, preservative and instructions on request.

SQUALLS

Southern North Atlantic

R.M.S. *Windsor Castle.* Commodore H. Charnley. Las Palmas to Cape Town. Observers, the Master, Mr. M. G. Ward, Extra 2nd Officer, Mr. P. H. Simpson, Extra 3rd Officer, crew members and passengers.

20th–21st June 1973. The barometer had been rising slowly and steadily since 1730 GMT on the 20th and there had been lightning all round the sky since 1930. The vessel was in soundings and at 2030, when the vessel was 20 miles WSW of Bijagós Breaker, we altered course to 145°T in 57 m. Shortly after 2130 a long, low bank of Cu cloud appeared on the south-east horizon and a few minutes later a dense bank of rain returns appeared on the radar, distance 18 miles, moving steadily towards the vessel from the east. At 2200 the wind veered sharply and increased from NW, force 3 to E'ly, force 6–7 as the cloud bank passed overhead. There was continuous sheet lightning, and later thunder was heard when the rain started at 2210. The rain became torrential, the thunderstorm intensified and the pressure fell quickly from 1014·5 mb to 1011·9 mb by 2222. The wind increased to E'ly, force 8 as the front passed over. The line of strongest returns on the radar indicated that the front was lying 340°/160°. As the wind increased the vessel listed some 3° to starboard with the force of the wind and the lightning was of sufficient intensity to illuminate several members of the crew on the fo'c'sle as if it were daylight. Visibility was somewhat impaired in the heaviest rain although a vessel 7 miles to the south-west was visible most of the time. The sea did not rise to any great extent in the early stages of the storm and by 2230, in the worst of the squall, the seas were very short and only 2–3 m high. At 2300 the wind veered to SE, force 5–6 and the vessel regained an even keel. The rain eased slightly, the lightning and thunder continued, but there was very heavy rain from 2310 until 2330. During the middle watch (at 0330) the wind backed to N'ly, force 5 and there was continuous heavy rain, thunder and lightning, and rough seas during frequent squalls.

Position of ship at 0001 on 21st: 10° 12′N, 16° 36′W.

Note. The *Windsor Castle* was in the region of the Inter-tropical Convergence Zone. Line squalls are a feature of the weather along the West African coast at this time and they normally exhibit all the features reported except that pressure normally rises after the wind has veered.

off Portuguese coast

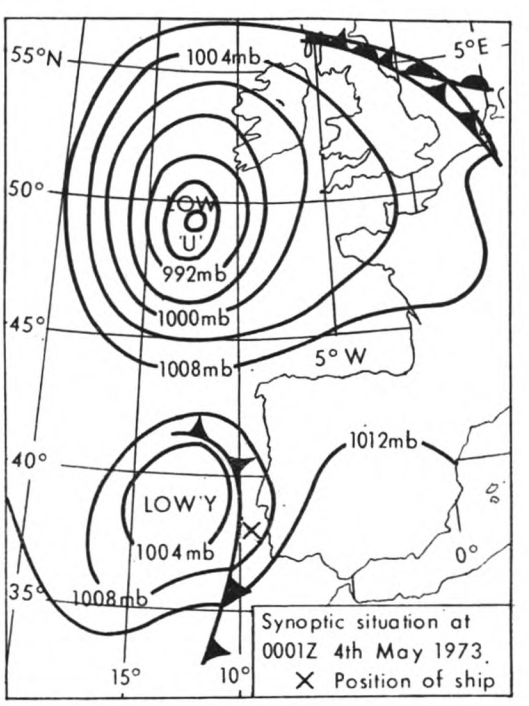
s.s. *Methane Progress*. Captain A. M. Andrews. Canvey to Arzew, Algeria. Observers, Mr. M. H. Rich, 2nd Officer and Mr. J. Haines, Seaman.

4th May 1973. While the vessel was off the coast of southern Portugal a large rainstorm was seen on the radar about 25 miles to the south-west at 0001 GMT. Ship's course 164°T at 17 kt. At 0010 the vessel entered this storm but the rainfall was moderate, shipping being visible for 10–11 miles. The wind was SSE, force 3–4 and the pressure 1006·2 mb. Three times during the period 0120–0215 the rain became torrential, similar to that during a monsoon. The wind veered to WSW, gusting to force 6–7 at times, and the maximum visibility was about 4 miles. By 0220 the pressure had fallen to 1001·8 mb but then began to rise. After the rain ceased at 0215 the cloud (St and Cb) began to break up in the west and the wind backed to SSW, force 7.

Lightning was seen at frequent intervals throughout the period but no thunder was heard. It is thought that the vessel passed close to the centre of a depression.

Position of ship at 0010: 38° 25′N, 09° 38′W.

Position of ship at 0240: 37° 57′N, 09° 29′W.



Note. The *Methane Progress* went through a cold front off Portugal (see chart). The intensity of rain and the type of cloud indicate that the surface cold front was the leading edge of some very cold air aloft and, being a maritime air mass with a long sea track, a substantial amount of moisture was available.

off East Africa

m.v. *Manipur*. Captain P. R. R. Ramsay. Mombasa to Wilmington. Observers, the Master and Mr. R. J. Williams, 3rd Officer.

3rd April 1973. Just before the onset of the south-west monsoon, the vessel entered an area of light rain showers at 0900 GMT and passed through some lasting

2–3 minutes. Course 171°T at 12·9 kt. Air temp. 30·7°C, wet bulb 27·9°. Pressure 1011·5 mb. Wind ESE, force 2. Cloud C_L8 at about 240 m. At 0930 a band of C_L7 was seen on the southern horizon and at 0949 we entered a moderate rain shower which had become torrential by 0952, with the cloud base approx. 45 m. From 0952 to 1006 the wind was E'ly, force 5 gusting to force 7, and the rain was being driven horizontally, obscuring vision even through the 'clear-view' screens. On the radar the rain echo covered an area 12 miles long and 2 miles wide, lying 155°/335°T. At 1010 the heavy rain ceased and the wind dropped to ENE, force 2. Air temp 25·5°, wet bulb 25·2°. Pressure 1011·0 mb.

Occasional light showers occurred until 1045 when the vessel again entered an area of heavy torrential rain in ESE winds, force 6–7 and reduced visibility. The radar echo of the associated C_L7 cloud, base 45 m, covered an area 9½ miles long and 4 miles wide, lying approx. N/S. At 1112 the rain eased slightly with the wind now SSE, force 4–5 and cloud base 90 m. Air temp. 24·4°, wet bulb 24·0°. Lightning was plainly visible to the south although no thunder was heard. At 1132 the rain was again torrential, the lightning still visible and the wind had backed to E'ly, force 3–4. By 1136 the rain was slight and the wind was E'N, force 1. The cloud base had lifted to about 150 m and a band of C_L5 was visible on the southern horizon.

Position of ship at 1000: 07° 34'S, 40° 23'E.

Position of ship at 1200: 08° 00'S, 40° 31'E.

Note. The *Manipur* was in the Inter-tropical Convergence Zone which is the northern limit of the south-west monsoon over the Indian Ocean. Hence the sharp changes of weather, and occasionally spectacular changes over land, at the onset of the monsoon.

LOCAL WINDS

Gulf of Tehuantepec

m.v. *California Star.* Captain A. J. Cheshire. Balboa to Los Angeles. Observers, the Master, Mr. A. Frost, 3rd Officer and other officers.

15th May 1973. Weather forecasts from San Francisco the previous day had given notice of strong N'ly winds in the Gulf of Tehuantepec so the vessel altered course into the Gulf. The purpose of this manœuvre was to reduce the possible fetch of sea, which was forecast to be on the starboard beam. The following extracts from the ship's log and meteorological logbook cover the duration of the wind's effect on the vessel. The diagram is a portion of Admiralty Chart 587 showing the ship's course and the winds experienced.

GMT

0200: Wind WNW, force 2. Vessel steering 309°T at 21 kt.

0400: Wind NW, force 2. A short 1 m swell observed from NW.

0500: Wind NW'ly, freshening to force 3–4.

0600: Wind NW, force 3 gusting to force 5, gradually veering and freshening. Moderate to rough NW'ly sea; short 1½ m swell.

0745: Course altered to 290°T at 21 kt.

0845: Wind NW'N, force 6–7.

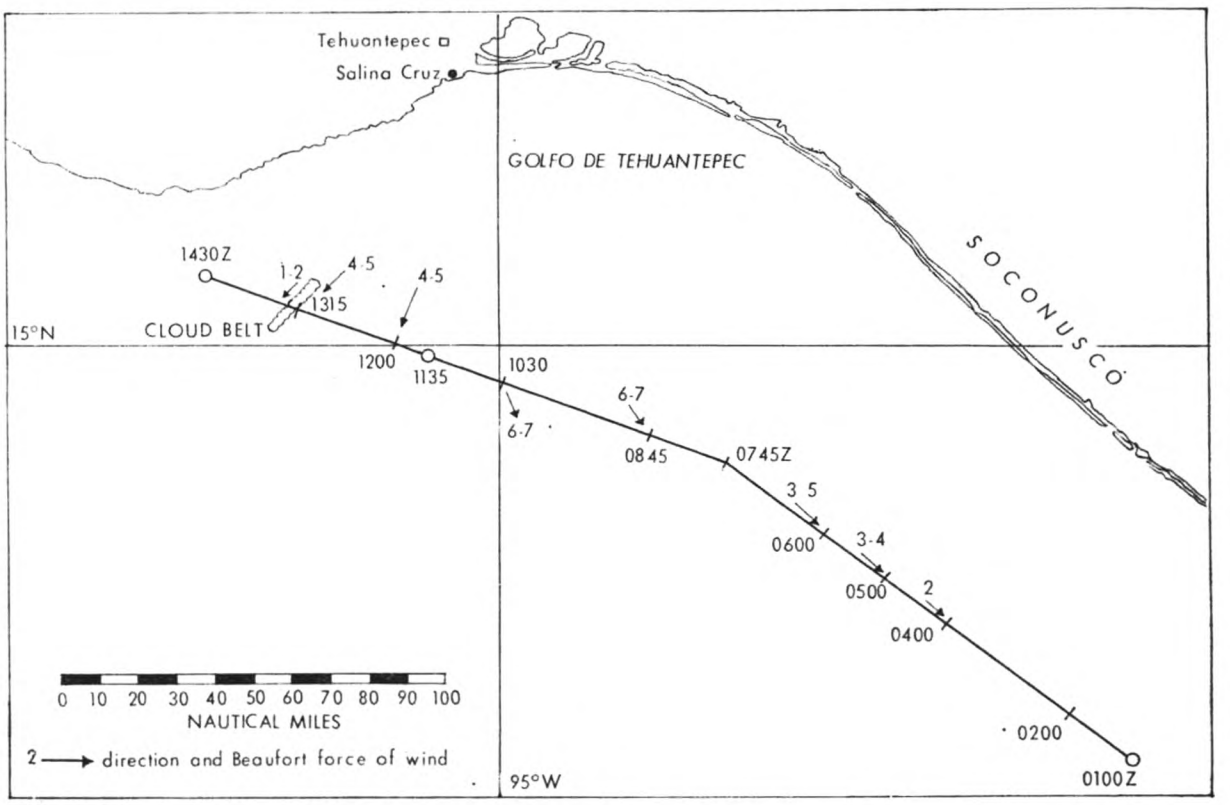
1030: Wind NNW, force 6–7, still veering but now beginning to moderate. Sea rough; heavy NW'ly swell.

1200: Wind NNE, force 5. NNE'ly swell of 3 m.

1315: A remarkable narrow belt of moderately high Cu cloud lying NE/SW was observed overhead. This appeared to mark the westerly limit of strong winds because within 20–30 minutes the wind has decreased from NE, force 4–5 to force 1–2.

Position of ship at 0100: 13° 11'N, 92° 16'W.

Position of ship at 1135: 14° 57'N, 95° 19'W.



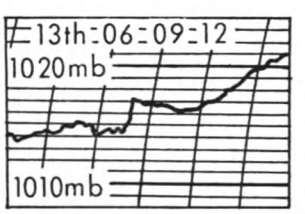
Note. This is an example of a 'Tehuantepecer'. Due to mountain ranges on either side, in a northerly flow a funnelling of the wind takes place through the Isthmus of Tehuantepec, the effects of which may be felt as far as about 100 miles from the coast in the region of the Gulf. These 'northers' may occur at any time of the year but are more frequent (an average of about five a month) during November, December and January. One seventh of the Tehuantepecers reach force 10–12 and the onset may or may not be accompanied by rain or squall cloud. Further, the barometer cannot be relied upon to give any warning of this wind and significant air-temperature fluctuations are unusual though sea-surface temperatures may fall after the onset due to upwelling.

WATERSPOUTS

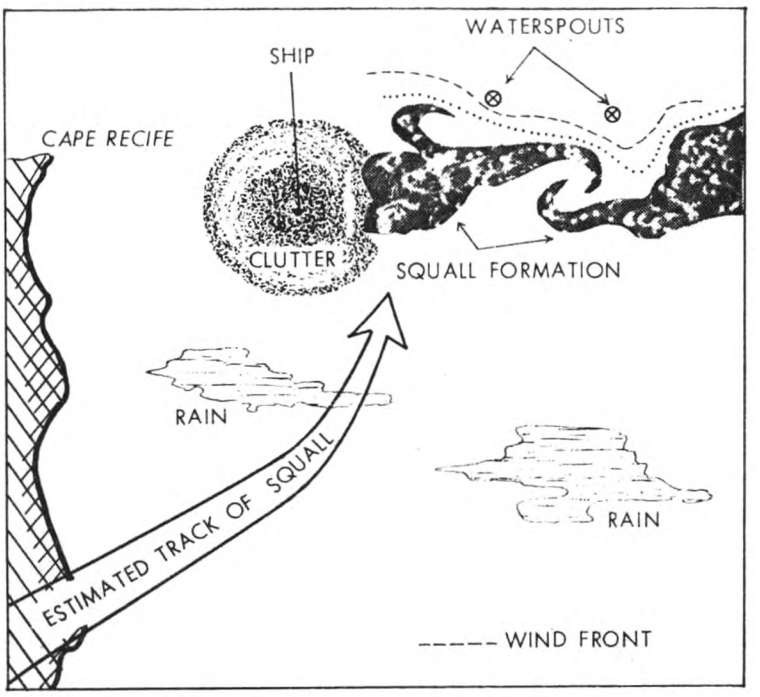
South African waters

m.v. *Armadale*. Captain F. J. Adams. London to Das Island, Persian Gulf. Observers, Mr. R. I. Wilson, 3rd Officer and Mr. Webster, Look-out.

13th June 1973. At 0830 GMT the look-out reported a waterspout approaching the vessel fast on the port quarter. Weather conditions for'ard of the beam at the time of sighting were good: SW'ly winds, force 3, slight sea, $\frac{3}{8}$ cloud and excellent visibility, though some heavy showers had been experienced during the previous watch and strong, towering Cb clouds were observed aft of the vessel half an hour



earlier. These clouds had now developed further, very dark and threatening with heavy precipitation. The squall line was about a mile astern and was preceded by two well-developed waterspouts of approx. 6 m radius and vertical movement of an estimated 30 m, each tailing into a cloud of water vapour half a mile apart. They quickly overtook the vessel (speed 17 kt) at an estimated speed of 30 kt, shaping an



erratic course between north and east, passing within 45 m of the vessel. As the squall line closed on the vessel the wind backed sharply from SW to S and increased to force 5–6, causing a short, steep sea with some foam. The barograph trace rose almost vertically and had risen over 2 mb within several minutes. Visibility was greatly reduced and a most interesting radar display of cloud formation was observed (see sketch). The phenomena lasted about 30 min. Air temp. 14·5°C, wet bulb 14·0°.

Position of ship: 34° 02′S, 25° 48′E.

Indian Ocean

m.v. *Prince Rupert City*. Captain J. H. J. Thornhill. Durban to Singapore. Observer, Mr. M. A. Gater, Chief Officer.

18th June 1973. At 1230 GMT the ship passed through the centre of a forming waterspout. The sea was extremely agitated below the spout which extended from the base of Cb cloud from a height of about 120–150 m. The system was moving quickly westward with the wind. No pressure or temperature changes were observed but light rain was experienced. The rotation seemed to be clockwise and the diameter at sea level was 180 m. Although the sea was so agitated there was no appreciable wind increase. After passing over us it very quickly dissipated, the area of agitated water disappearing with the forming column above. No other waterspouts were in the area.

Position of ship: 19° 00′S, 57° 20′E.

ST. ELMO'S FIRE

Little Minch

s.s. *Atlantic Conveyor*. Captain D. L. des Landes. Göteborg to Greenock. Observers, the Master and Mr. M. St.E. Cardew, 3rd Officer.

1st April 1973. At 2255 GMT, when passing through light rain, St. Elmo's fire was observed for a duration of 3 minutes on bridge projections, masts and aerials. Also purple flames about 20 mm long were seen coming from one's finger nails when a hand was extended over the dodger. Air temp. 3·5°C, wet bulb 3·5°. Pressure 1000·5 mb. Low Cu clouds; exceptional visibility.

Position of ship: 57° 30′N, 06° 38′W.

Southern North Atlantic

s.s. *Pendennis Castle*. Captain P. St.Q. Beadon. Cape Town to Las Palmas. Observer, Mr. A. Davidson, 3rd Officer.

8th May 1973. At 0340 GMT an intense electrical storm passed over the vessel travelling in a SW'ly direction. Line squalls were observed on the radar and the wind increased to force 5 or 6 in gusts and backed from SW to NE. There was continuous lightning for the duration of the storm which lasted approx. 1 hour. Occasional thunder was heard and heavy rainfall, accompanied by rapid pressure fluctuations of ± 2 mb, was recorded. At the height of the storm St. Elmo's fire was observed on the tips of the whip aerials. Lightning frequently reached the surface but not in the vicinity of the vessel. Air temp. 25·0°C, wet bulb 24·0°, sea 30·0°.

Position of ship: 07° 05'N, 14° 20'W.

Gulf of Guinea

s.s. *British Confidence*. Captain P. D. Harrison. Angle Bay, Milford Haven to Forcados, Nigeria. Observer, Mr. J. L. Drewitt, 2nd Officer.

29th May 1973. Between 0030 and 0230 GMT heavy rain was experienced for the first hour with frequent lightning. At 0115 the starboard bridge-wing radio whip aerial was seen to have a saucer-shaped cap of light, violet in colour and about 10 cm in diameter. On closer inspection through binoculars pencil-shaped flashes were seen to be present in a position about 2 m from the top, each flash being about 10–15 cm long. At 0130 one of the radio aerials was seen to have small points of light upon it which moved down the aerial quite slowly and flashed on and off at times.

Position of ship: 04° 35'N, 00° 47'W.

Southern North Pacific

s.s. *Benavon*. Captain J. R. Morrison. Kobe to Panama Canal. Observers, the Master, Mr. E. P. Gibb, Chief Officer and Mr. H. F. Jeffrey, Cadet.

21st May 1973. Between 0900 and 1030 GMT St. Elmo's fire was observed intermittently on the tips and stems of the whip aerials on the bridge and foremast. There was a smell of burning and also a humming noise. The sky was heavily overcast with heavy rain squalls accompanied by lightning. Air temp. 24·3°C, wet bulb 23·8°, sea 28·0°. Wind NW'ly, force 3.

Position of ship: 07° 06'N, 81° 48'W.

GIANT CUMULONIMBUS

Southern North Atlantic

m.v. *Clan Maclaren*. Captain W. J. Howson. Cape Town to London. Observers, the Master, Mr. A. J. Blackler, Chief Officer and Mr. T. R. Alder, 2nd Officer.

1st April 1973. At 1600 GMT several well-developed Cb clouds were present, with showers below and occasional lightning flashes seen at a distance of 20 miles in sunshine. One such cloud was measured for height and the distance of the shower was taken from the radar. The resultant height by sextant was 71,000 ft (21,650 m) and it was noticed that the Ci cloud in the sky, unattached to that particular Cb cloud, was below the top of the Cb which had no trace of an anvil. Air temp. 29·0°C, wet bulb 26·0°, sea 31·2°. Pressure 1009·5 mb. Wind variable, force 2. Course 323°T at 14·3 kt.

Position of ship: 03° 00'N, 11° 38'W.

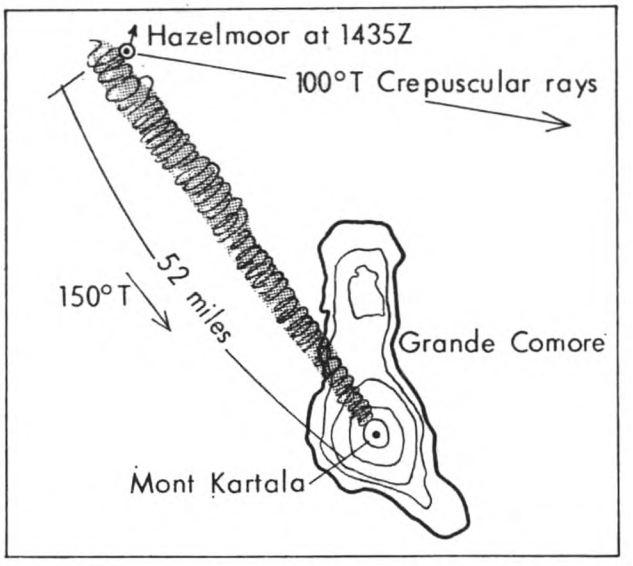
Note. The design and operation of supersonic transport stimulated an interest in the heights and distributions of cumulonimbus tops and a recent assessment of available data found that levels occasionally exceeded 70,000 ft (21,340 m) over India and were probably the highest in the world. The cloud measured from the *Clan Maclaren*, growing beyond the levels of cirrus, must have been most impressive. In computing cloud height by that method there is a risk that the shower pin-pointed by radar may not be from the particular cloud measured by sextant.

OROGRAPHIC CLOUD AND CREPUSCULAR RAYS

Moçambique Channel

m.v. *Hazelmoor*. Captain T. R. Rowe. Marseilles to Aden. Observer, Mr. E. G. Stout, 2nd Officer.

1st May 1973. At 1440 GMT a vast orographic cloud, originating from Mont Kartala (2,359 m), Ile Grande Comore, and crepuscular rays were observed simultaneously to the eastward, approx. 22 min before sunset. The cloud (St) extended unbroken from Mont Kartala to the vessel, a distance of 52 miles, diminishing almost overhead and was funnel shaped, with slightly more horizontal than



vertical extent. It was visible, latterly a deep orange colour, from approx. 1435 until about sunset at 1457 after which it quickly diminished to the northwards of the island, bearing 100°T. Five broad crepuscular rays were observed at 1440 for about 5 min, emerging from just above the horizon. The rays were a whitish glow becoming fainter with altitude and finally becoming invisible at an altitude of 6°. The centre ray was vertical and the outer rays about 35° to the horizon. Air temp. 28·3°C, wet bulb 25·3°. Wind SE'S, force 2. Cloud $\frac{3}{8}$ Cu. Course 022°T at 12 kt.

Position of ship at 1435: 10° 58'S, 42° 59'E.

DUST DEPOSIT

Southern North Atlantic

m.v. *Fourah Bay*. Captain W. E. Bellamy. Liverpool to Lagos. Observers, the Master and all officers.

30th–31st May 1973. At 1200 GMT on the 30th a slight horizon haze was first noticed; visibility prior to this was approx. 13 miles and, on encountering the haze, was reduced to 7–8 miles. The haze gradually thickened and by 1800 visibility had decreased to approx. 5 miles. During the evening, as dew formed on the ship's superstructure, fine particles of red sand were trapped eventually causing muddy

brown streaks especially on the bridge front. Both wet and dry thermometers were also coated, with dust turning to mud on the muslin and wick which had to be replaced. During the whole of this period the wind was N–NNE, force 5 and considerable variations in sea temperature from 19° to 26°C were noticed. Cloud observations were made difficult, if not impossible, due to conditions at the time.

At 0800 on the 31st the haze began clearing rapidly, prior to this the wind had backed from N'ly, force 5 to W'ly, force 3.

An air temp. rise had been noted just before encountering the haze, rising approx. 3 degC in an hour and a half.

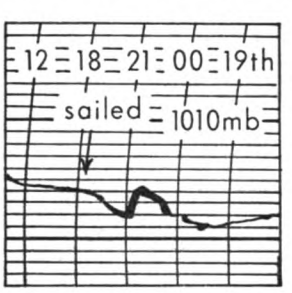
Position of ship at 1200 on 30th: 19° 39′N, 17° 48′W.
Position of ship at 1800 on 30th: 17° 58′N, 17° 49′W.
Position of ship at 0800 on 31st: 14° 20′N, 17° 40′W.

SANDSTORMS

Gulf of Sirte

s.s. *Esso Warwickshire.* Captain H. Johnson. Marsa el-Bréga, Libya to Fawley. Observers, the Master, Mr. R. R. Walker, 2nd Officer and Mr. W. McCully, A.B.

18th–19th April 1973. While the vessel was loading at Marsa el-Bréga on the 18th a sandstorm was experienced with ENE winds, force 5–8, reducing visibility to about half a mile. The pressure was falling steadily. At 1830 GMT the loading was completed and the vessel sailed, course 313°T at 17 kt. At the time the visibility was over 8 miles, wind E'ly, force 4, pressure 1005·1 mb and air temp. 22·8°C. At 1930 the pressure fell rapidly until 2200 when it was 1001·8 mb. At 2130 visibility deteriorated to half a mile in a sandstorm and the wind increased to ENE, force 6–7.



Pressure then started to rise very quickly until it reached 1004·5 mb, then fell to 1002·1 mb by 2345 when rain showers passed by the vessel with intermittent lightning.

At 0001 on the 19th, when the visibility had deteriorated to less than half a mile, the nearest land to windward was 90 miles and to leeward (port beam) 40 miles. Half an hour later the wind changed to E'ly, force 5, visibility improved to 6 miles and the cloud was 8/8 Cs. Air temp. 17·2°C.

Position of ship at 1800 on 18th: 30° 28′N, 19° 33′E.
Position of ship at 0001 on 19th: 31° 30′N, 18° 18′E.

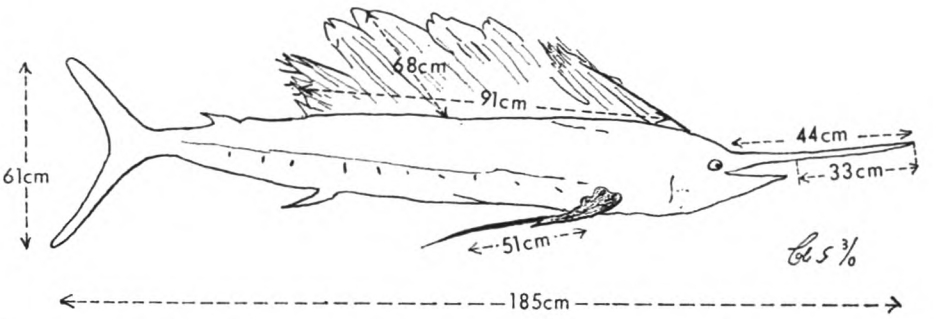
Note. During 18th and 19th April a low-pressure system travelled east across Libya just south of 30°N. The airstream encountered over the Gulf of Sirte may well have been drawn from the northern Libyan Desert.

FISH

Persian Gulf

m.v. *Serbistan.* Captain T. W. Price. At anchor off Abu Dhabi. Observers, the Master, Mr. G. C. Stonehouse, 3rd Officer and rest of ship's company.

29th April 1973. At 1230 GMT a sail-fish was hooked at a depth of 11 m. After an



hour's fight it was landed, weighed, measured and photographed [*see* opposite page 68]. It weighed 32 kg. Measurements are given in the sketch. Wind NW, force 2–3. Sea temp. 26·5°C.

Position of ship: 24° 36′N, 54° 18′E.

SWIMMING CRABS

Indian Ocean

m.v. *Hazelmoor*. Captain T. R. Rowe. Marseilles to Aden. Observer, Mr. E. G. Stout, 2nd Officer.

5th–6th May 1973. Between 2130 GMT on the 5th and 0030 on the 6th, making a course 022°T at 12·5 kt, the vessel passed through swarms of crabs thought to be of the *Charybdis edwardsi* breed. Observed with the aid of the Aldis lamp, these crabs appeared motionless just under the surface until disturbed by the ship's wash or Aldis beam when a desperate attempt would be made to escape from the latter. Their eyes reflected a vivid gold and the body appeared to be brownish or faded pink. The weather was fine and clear with little or no cloud. Wind variable or SW, force 1. Sea temp. 29·7°C. Approx. depth of water 3,650 m.

Position of ship at 2130: 08° 00′N, 51° 03′E.

Position of ship at 0030: 08° 35′N, 51° 17′E.

Note. Dr. A. L. Rice, then at the Department of Zoology, Natural History Museum, commented:

"The crabs certainly seem to have been *Charybdis edwardsi* since the position, appearance and behaviour of the animals, and the time of day, agree very closely with the earlier records (see *The Marine Observer*, January 1969, pp. 17–20). However, one interesting difference is the date of this observation, the earlier sightings being restricted to the period September–March and usually being in October–December. We would be glad to receive specimens collected during any future sightings of this sort."

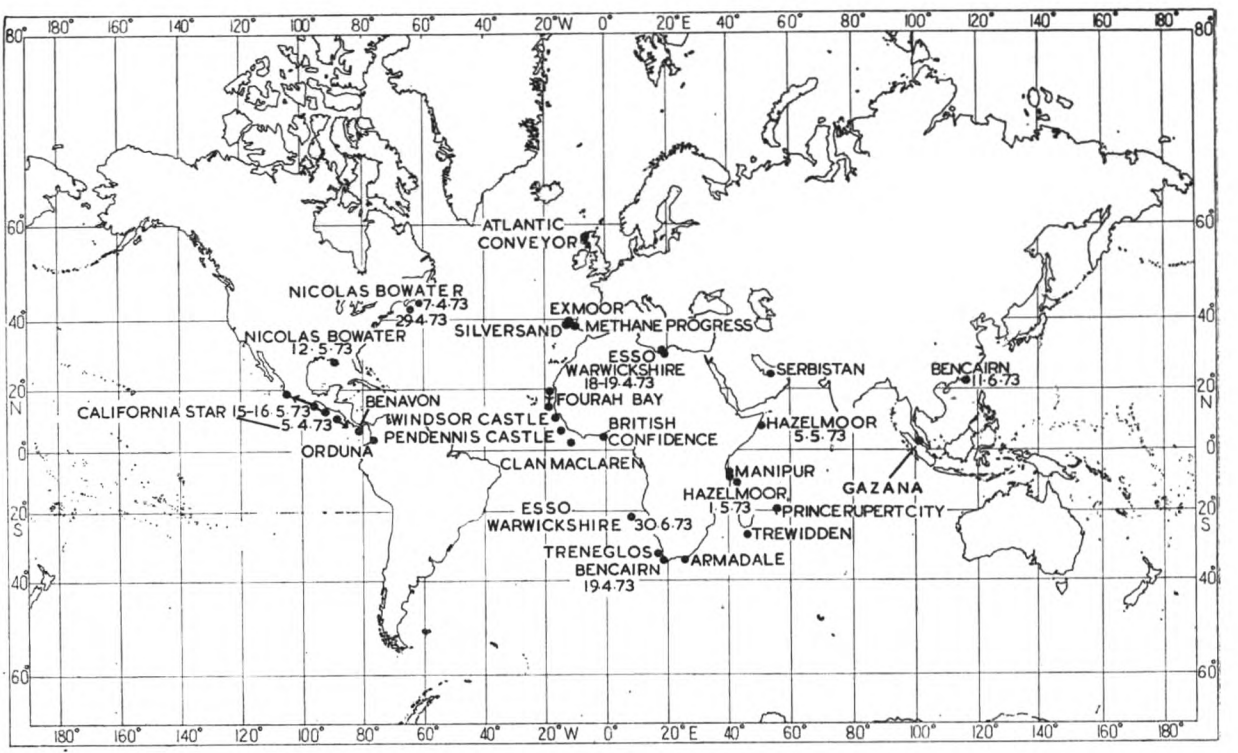
BIRDS

English Channel and Eastern Atlantic

s.s. *Esso Warwickshire*. Captain I. Grigor. Fawley to Dubai via Cape Town. Observers, the Master, Mr. J. N. O'Dowd, 3rd Officer and ship's company.

12th–30th June 1973. On the 12th three racing pigeons boarded the vessel in the English Channel and remained with us, even when we stopped at Tenerife on the 16th. All three were very tame and easily caught. The ring details were as follows: one mainly white bird with brown markings, NU 72 C37934; one blue chequer, NU 69 B71156; and a second blue chequer (the largest of the three), HOLL 7290941. The two blue chequer birds seemed to form a pair and remained separated from the white one. All three were fed and watered regularly by the crew but we were concerned about the birds' ability to survive the heat of the Persian Gulf when we arrived there.

During the evening of the 30th our three pigeons left the ship. It is believed that



Position of ships whose reports appear in "*The Marine Observer's Log*".

they boarded a Yugoslav general cargo ship which passed close to us, as no doubt there were large amounts of grain in such a vessel. It could be said that our pigeons had 'defected to the East'.

Position of ship at 1800 GMT on 30th: 22° 06′S, 07° 48′E.

Note. Major L. Lewis, M.B.E., Secretary of the Royal Pigeon Racing Association, comments:

"Thank you for the information regarding the pigeons which landed on the *Esso Warwickshire*. We will inform the owners of the NU ringed birds that their pigeons were cared for aboard that ship." [All rings registered at Major Lewis's office (formerly The Royal National Homing Union) commence with the letters NU.]

"The other pigeon, HOLL 7290941, we will report to the Secretary of the Dutch Pigeon Union."

Eastern North Atlantic

m.v. *Exmoor*. (Captain not named.) Cape Town to Liverpool. Observers, Mr. L. Sullivan, 2nd Officer and Mr. K. Whittle, Cadet.

24th June 1973. At 1200 SMT five pigeons alighted on board; two were wearing leg bands. One bird was brown with white flecks on the back, with a grey breast. The right leg had a yellow band numbered J875 and on the left leg was a silver band inscribed PORT 72 407331. The other ringed pigeon had a red band on each leg, the one on the left with no numbers visible, the one on the right numbered PORT 71 148842. Any information about these birds would be of interest.

Position of ship: 39° 12′N, 11° 34′W.

Note. The following reply was sent to Mr. Sullivan:

"From previous reports we know that the two ringed birds would have been Portuguese racing pigeons. The '72' and '71' on the bands would be their year of birth and the six-figure groups indicate the registration numbers at their homing union. The other bands are the equivalent of race entry tickets which, if the pigeons had arrived at their home loft quickly, would be removed by the owners and placed in a timing clock which records the day, hour, minute and second of arrival."

Eastern North Atlantic

m.v. *Silversand*. Captain A. N. Hirst. Middlesbrough to Monrovia. Observers, Mr. J. D. Robinson, 2nd Officer, Mr. S. L. Bishop, Cadet and Mr. E. Wingstedt, Carpenter.

17th April 1973. At 1000 GMT the blissful peace which reigns after morning sights was shattered by the entrance of our greater bearded carpenter in a state of great excitement. Pointing, he cried, "There's a hoopoe!" and sure enough, there on the starboard side of the main deck it sat, looking for all the world like a dowager aunt dressed in a feathered hat and zebra-skin coat. Taking Chippy at his word, the bird was indeed a hoopoe.

It was about 38 cm in length from bill to tail. Its bill was long, narrow and curved, dark in colour. The head was golden brown with two large dark patches. Its crest was about 5 cm long, black in colour, with two small brown markings at the side about halfway to the tip. The face and neck feathers were a uniform fawny gold whereas the underparts were pale fawn. The bird's wings and back were fawn towards the head, becoming paler towards the tail and distinctively barred with black. The flat-ended tail was about 7 cm long, 3 cm wide and was black edged with white.

We were surprised to see this bird so far from land (we were approx. 140 miles from Cabo da Roca, Portugal) as it was obviously an insect-eating bird more used to the forest than the water. At about 1030 the bird was seen to fly off to seaward. Wind SE, force 3.

Position of ship at 1000: 38° 15′N, 12° 30′W.

Note. Hoopoes are now distributed generally throughout southern Europe, Africa and southern Asia. Numbers also migrate regularly northwards from Africa into Europe during early spring, March to April, returning in the autumn.

Western North Atlantic and Gulf of Mexico

s.s. *Nicolas Bowater*. Captain J. B. Caley. New Orleans to Corner Brook, Newfoundland. Observers, the Master, Mr. L. Robbins, 3rd Officer and Mr. J. Henderson, 2nd Officer.

7th April 1973. At 1500 GMT, when about 25 miles off the coast of Nova Scotia with the wind W'ly, force 3, a land-bird alighted on board. It was about the size of a small blackbird and had a shiny dark-green body with the underside appearing black at times, depending on the light. The head was dusky brown and the bill pointed and pale grey. Wing span was about 30 cm.

Position of ship at 1200: 44° 30′N, 61° 00′W.

29th April. Norfolk, Va. to Corner Brook. At 2100 GMT a white heron-type bird was observed on board. It stood upright, about 45 cm high, with long grey legs and a long, pointed, yellow/orange beak. On the top of its head was a patch of orange, this being the only apparent colouring. The bird seemed to resemble the one sketched on page 163 of *The Marine Observer*, October 1971 [an American White Egret]. Photographs were taken (*see* opposite page 68) but the bird was scared away by the movement.

Position of ship: 42° 54′N, 64° 10′W.

12th May. Corner Brook to New Orleans. Two birds, apparently identical to the one on 29th April, alighted briefly on the ship. They had the same patch of orange (or light brown) on their heads and also a patch on their back between the wings. The bodies were of a similar size to a pigeon's with legs of 15–23 cm which extended beyond the body in flight. The feet were four-clawed.

Position of ship (approx.): 28° 25′N, 88° 50′W.

Note 1. Captain G. S. Tuck, Chairman of the Royal Naval Birdwatching Society, comments: "The land-bird was a male (Eastern) Cowbird (*Molothrus ater ater*); the male is the only

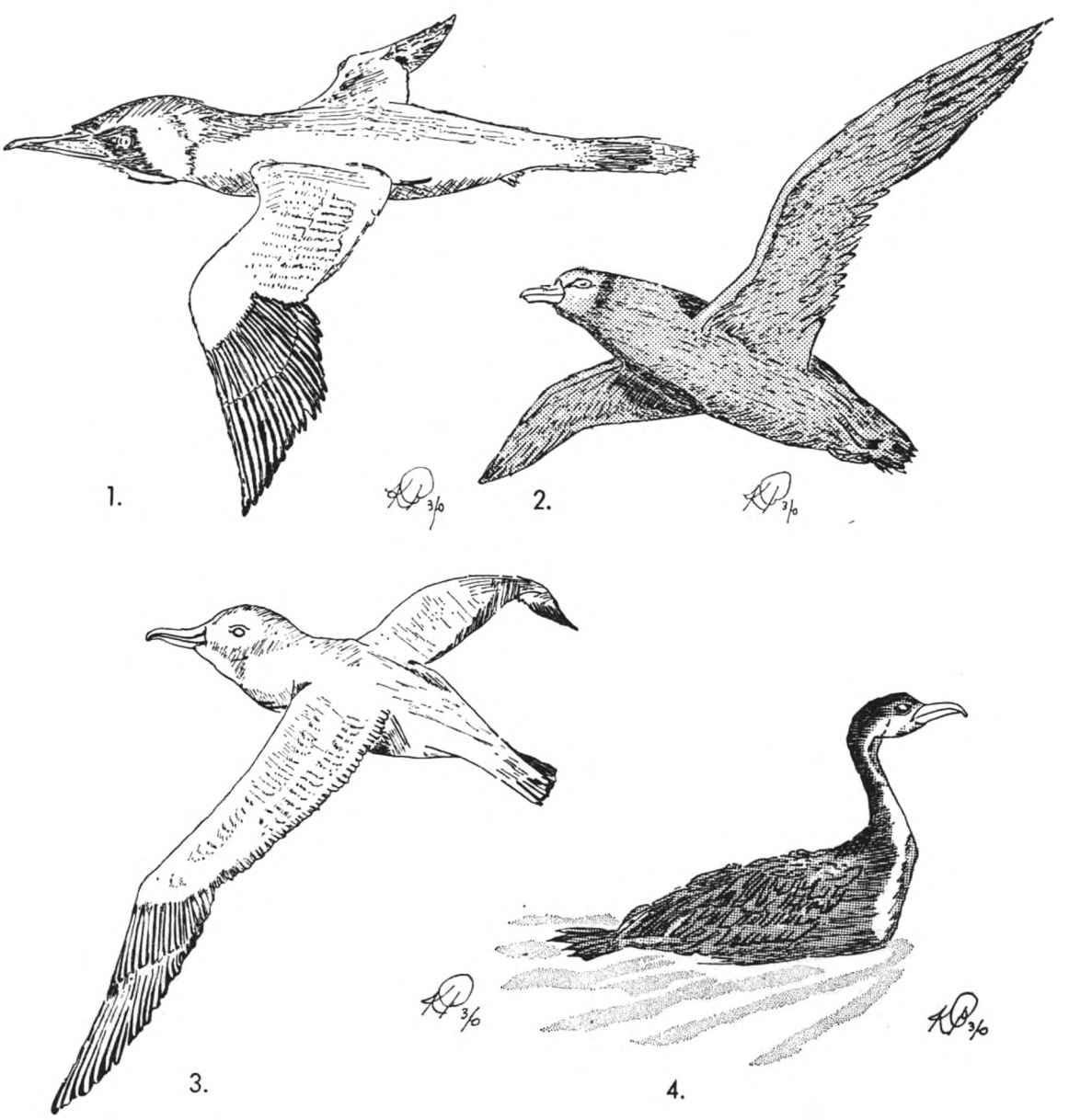
blackish species with a brown head. It is 20 cm long and it breeds in Nova Scotia. The other birds were Cattle Egrets (*Ardeola ibis*) in their breeding plumage. They have now extended their breeding range northwards to New Jersey and wander as far north as Maine. They also breed in the West Indies area in colonies, in mangrove swamps and islets."

Note 2. Reference books give a variety of names for *Molothrus ater ater*: Cow Blackbird, Cow Bunting, Brown-headed Blackbird, Cuckold, Cow-pen Bird, Buffalo Bird, Brown-headed Oriole. Another name, Lazy Bird, probably comes from its habit of "leaving all family care to others, like the European Cuckoo".

Eastern South Atlantic

m.v. *Treneglos*. Captain L. E. Quigley. Penang to Lisbon. Observers, Mr. K. Papworth, 3rd Officer and Mr. P. D. Davies, 2nd Officer.

7th April 1973. Between 0800 and 0900 GMT, when the vessel was north-bound from the Cape of Good Hope, the weather was calm with mist and fog patches. Having just steamed out of a fog bank it was observed that the surrounding area was teeming with wild life especially birds, some of which have been illustrated in sketches. Especially plentiful were the Cape Gannet (1) and Giant Petrel (2). Also observed were the Wandering Albatross (3) and the White-breasted Cormorant (4) which was mistaken on several occasions for a Jackass Penguin. Seals



were in evidence, lazing on the surface, although I was disappointed not to observe the Jackass Penguin when the vessel was in the vicinity of Robben Island. The 2nd Officer reported seeing several Pintado Petrels the previous day.

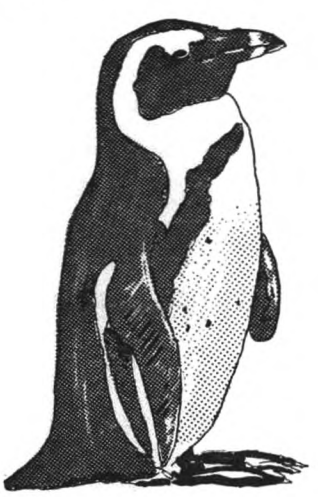
Position of ship (approx.): 32° 45′S, 17° 05′E.

South African waters

s.s. *Bencairn*. Captain R. McPhee. Amsterdam to Durban. Observer, Mr. W. F. P. Cargill, 2nd Officer.

19th April 1973. At 1300 GMT, when the vessel was about 8 miles south-west of Quoin Point, South Africa, a number of gannets could be seen circling and then diving into the water, apparently chasing fish. On approaching closer it was observed that five penguins were in the water; it looked as if the gannets were either attacking them or both were chasing fish. The penguins had white bellies, white crowns and a white stripe down the back. They had black on their cheeks and what looked like a tufted piece coming away from the beak though it may have been a fish or something else in the beak. The colourings are very approximate as the birds were observed through binoculars and, when the ship came close to them, they dived. Air temp. 18·0°C, sea 17·3°.

Position of ship: 34° 53′S, 19° 30′E.



Note. The Cape Penguin nests on all islands off the Cape Province and is also known, from its braying call, as the Jackass Penguin (66 cm long). As our sketch shows, it has distinctive white marks on the upper and lower beak which could be deceptive at a distance.

Eastern Pacific Ocean

m.v. *California Star*. Captain A. J. Cheshire. Los Angeles to Panama Canal. Observer, Mr. A. Frost, 3rd Officer.

5th April 1973. During the forenoon a bird, identified as a Storm Petrel, was found on the deck by the Purser and was brought to the bridge. It was placed in a binocular box where it remained absolutely still, plainly exhausted, for some time. Eventually it began to take more of an interest in life and was also noticed to be shivering slightly, whether from fright or from the effect of the air-conditioning in the wheel-house is uncertain. A saucer of fresh water was provided in which it sat for some time, drinking occasionally. During the afternoon it was given the use of the swimming pool but apparently felt unready to become wet all over at once! The bird was returned to its temporary quarters where it rested for a while. By the beginning of the first watch, approximately 13 hours after capture, the bird was attempting to climb from the box, using its wings to haul itself out. With this in

mind it was taken on to the bridge wing and released. Darkness prevented observation of its flight but, from the speed with which it left the vessel, there can be little doubt that the bird had sustained no injury. Wind variable, force 2–4 during the day.

The bird was identical to the one reported by the *Pando Sound* in *The Marine Observer*, October 1972, identified by Captain Tuck as a Madeiran Storm Petrel.

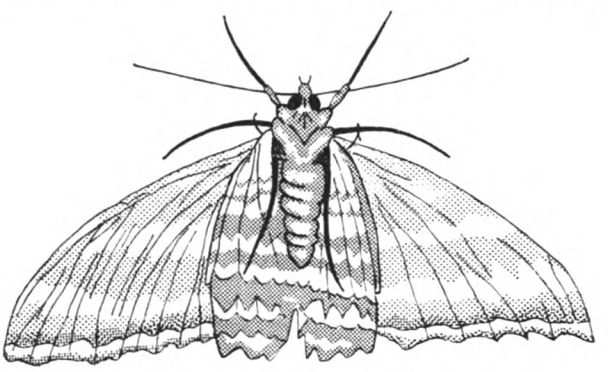
Position of ship: 10° 41′N, 87° 53′W.

INSECTS

at Buenaventura, Colombia

m.v. *Orduna*. Captain R. T. Riley. In port. Observers, Mr. D. G. Outen, 3rd Officer and Mr. M. Sime, 2nd Radio Officer.

29th April 1973. At 0530 GMT a tropical moth was found, length 3·8 cm and width of wings 10 cm. It was a brown, mottled colour with a vivid orange underside



and was believed to be either an Elephant Hawk-moth or a Death's-head Hawk-moth (no books on the subject available). The sketch by Mr. Sime shows the underside of the moth.

Position of ship (approx.): 04° 00′N, 77° 00′W.

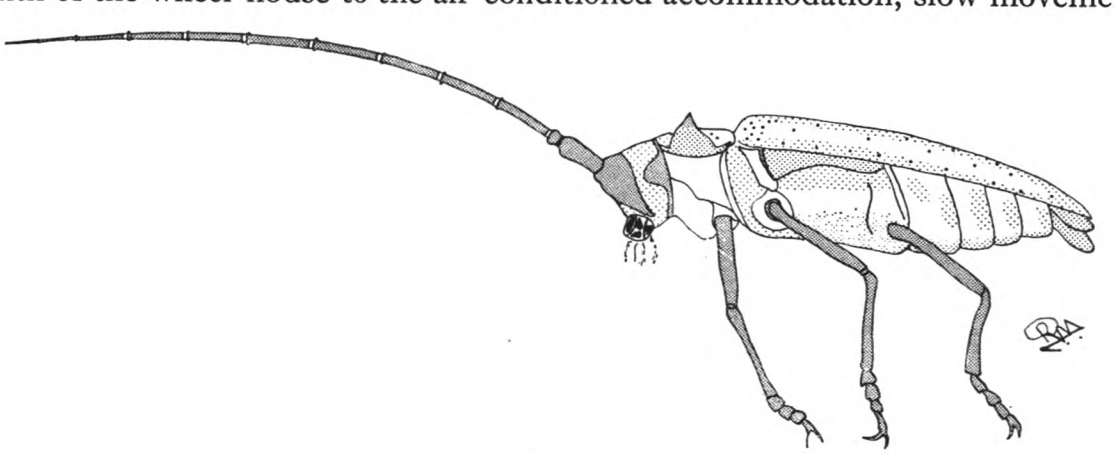
Note. Mr. R. D. Pope, Coleoptera Section, Department of Entomology, Natural History Museum, comments:

"The moth belongs to the family Noctuidae, sub-family Ophiderinae. There are several genera to which it could belong and the specimen would be necessary for a closer determination."

Eastern Pacific Ocean

m.v. *California Star*. Captain A. J. Cheshire. Balboa to Los Angeles. Observers, Mr. A. Frost, 3rd Officer and Mr. P. R. Maudsley, Cadet.

16th May 1973. At 1610 GMT the insect shown in Mr. Maudsley's sketch was found lying on the chart, apparently dead. However, when moved from the relative warmth of the wheel-house to the air-conditioned accommodation, slow movement



of legs and feelers resulted. The body was 4 cm long, mostly yellow-ochre, with grey/white parts (as shaded in the sketch) and white along the back with black spots. The legs and antennae were brown, the antennae being 5 cm long, ten segments in each. The eyes and mandibles were black. Unfortunately no facilities for preservation were available. Air temp. 26°C. Wind W'N, force 3.

Position of ship: 18° 55'N, 104° 34'W.

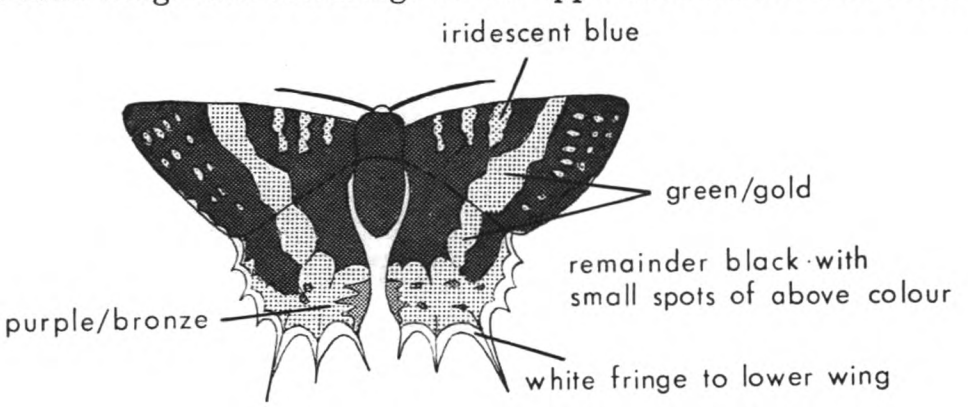
Note. Mr. R. D. Pope comments:

"The beetle is a Cerambycid [Long-horned], sub-family Lamiinae. It is called *Deliathis quadritaeniata* and the recorded distribution includes Venezuela." (The *California Star* entered the Caribbean through the Mona Passage and did not call at any South American port on her way to Cristobal.)

Indian Ocean

m.v. *Trewidden.* Captain L. J. Annett. Kakinada, India to Cape Town. Observers, Mr. L. H. Johnson, 2nd Officer and Mr. R. Ley, 3rd Officer.

6th June 1973. At about 2100 GMT a moth was caught in the ship's smoke-room. The nearest land at the time was the southern tip of Madagascar to the north, distance about 115 miles. Its wing span was 7·5 cm and its length 3·8 cm from head to tip of hind wing. The colourings of the upper side are indicated in the sketch



The underside was patterned in an iridescent blue/green and bronze/purple on black. Its body had bronze-coloured hairs on the underside, black above. Air temp. 22°C. Wind N'E, force 4. Course 249°T at 12 kt.

Position of ship: 27° 24'S, 46° 07'E.

Note. Mr. A. Watson, Department of Entomology, Natural History Museum, comments:

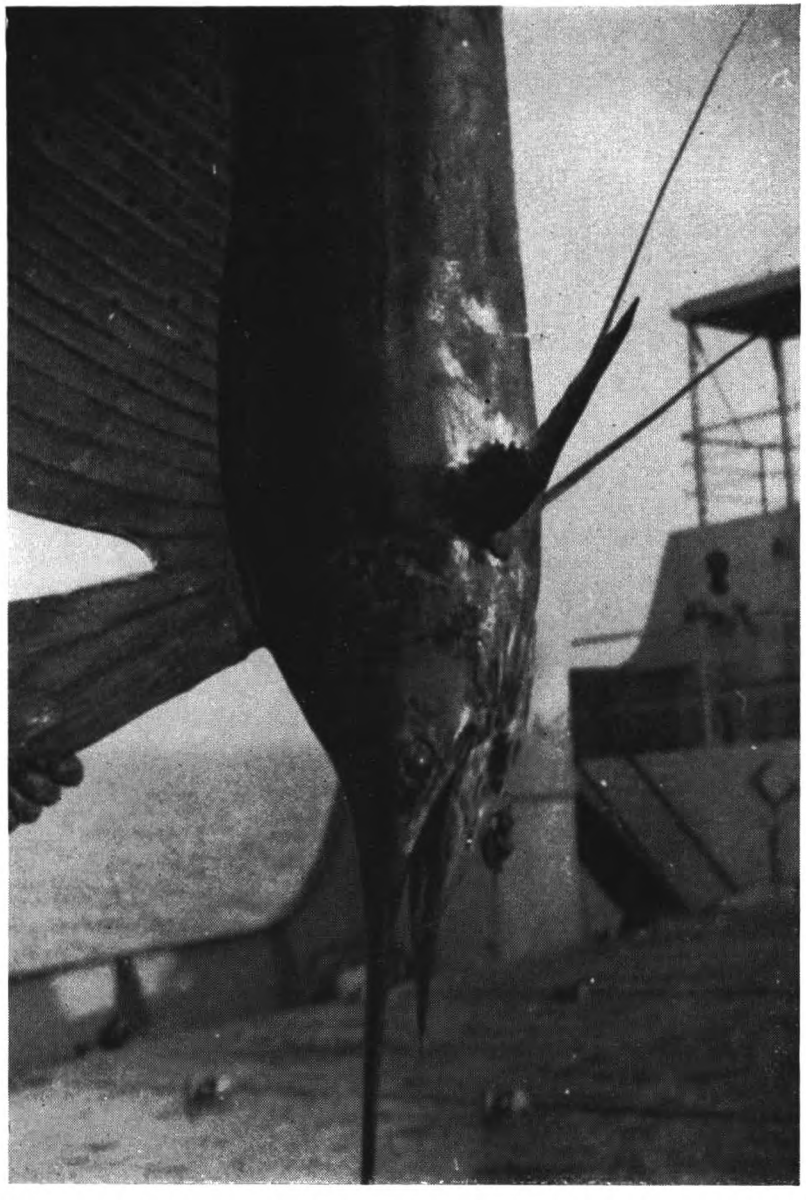
"This is almost certainly a specimen of *Chrysiridia ripheus* Drury, a Madagascan species of the family Uraniidae. The wings of this moth, which has been described as the most beautiful moth in the world, are used in the manufacture of costume jewellery."

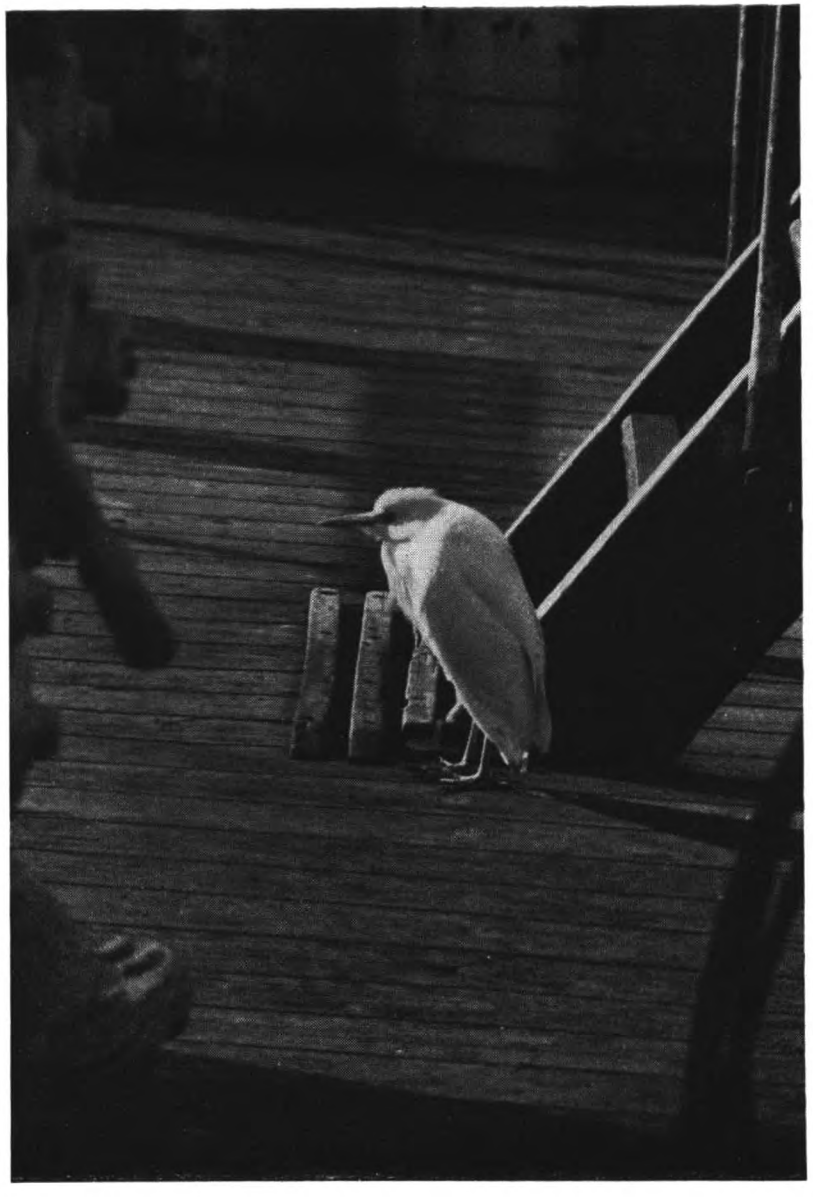
Strait of Malacca

m.v. *Gazana.* Captain D. Watson. Sakai, Honshu to Ra's Tannūrah. Observers, Mr. I. F. McRae, 2nd Officer, Mr. S. Yeamans, 3rd Officer and Mr. A. B. Swanson, Radio Officer.

27th May 1973. Whilst at anchor in the Malacca Strait during engine repairs a dragonfly found its way into the wheelhouse, causing fear and trembling in the 3rd Officer. However, help was at hand and Mr. Swanson, our intrepid Radio Officer, donned his shining armour and captured the monster. Unfortunately, in the fierce struggle that ensued the dragonfly was killed, giving us an opportunity of examining him closely.

It was 9 cm long overall and had a wing span of 11·5 cm. The wings were transparent with a delicate criss-cross pattern which we took to be skeletal structure.

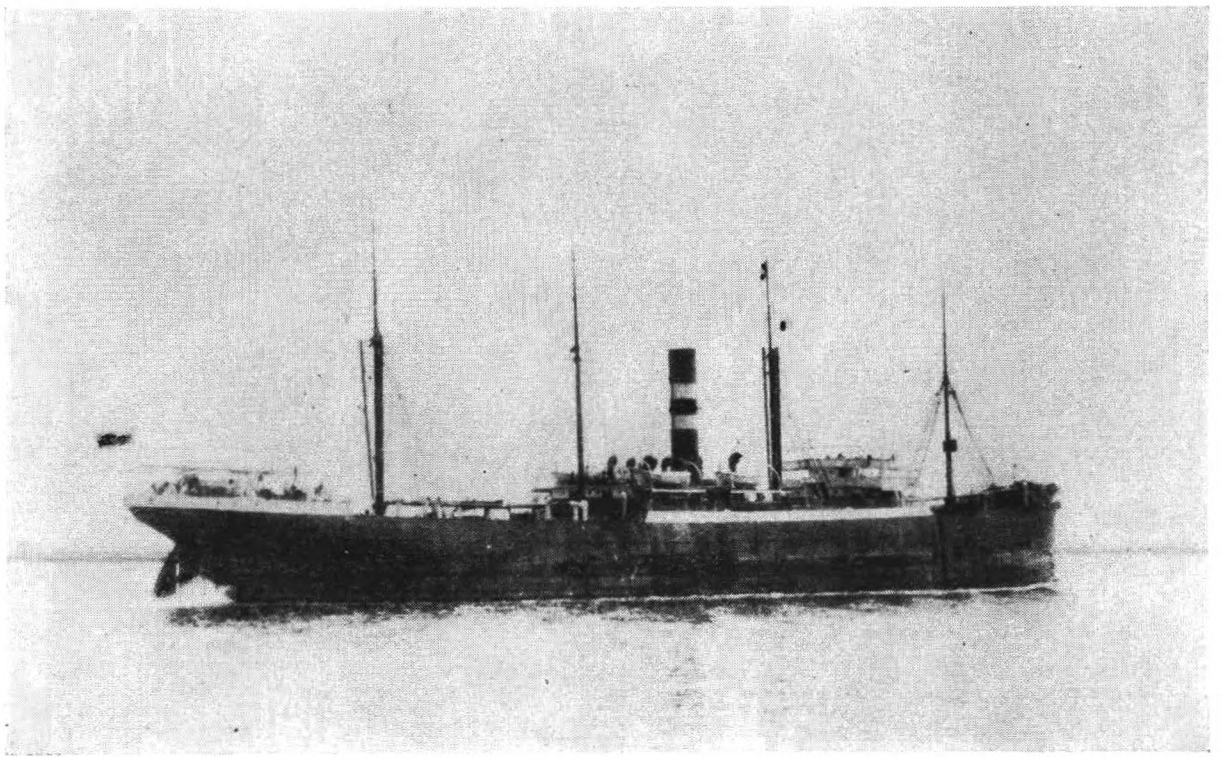




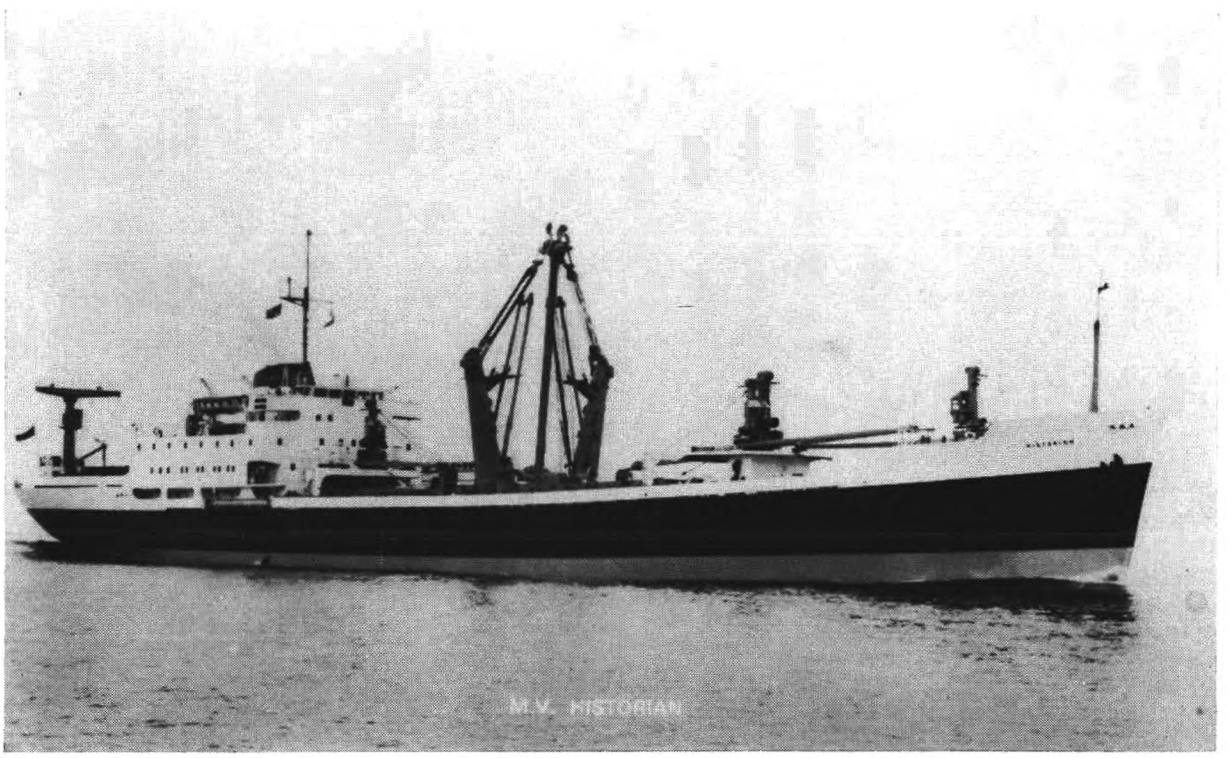
The sailfish aboard the *Serbistan* (*see* page 61) and the Cattle Egret which visited the *Nicolas Bowater* (*see* page 64).

(*Opposite page* 68)

(*Opposite page* 69)

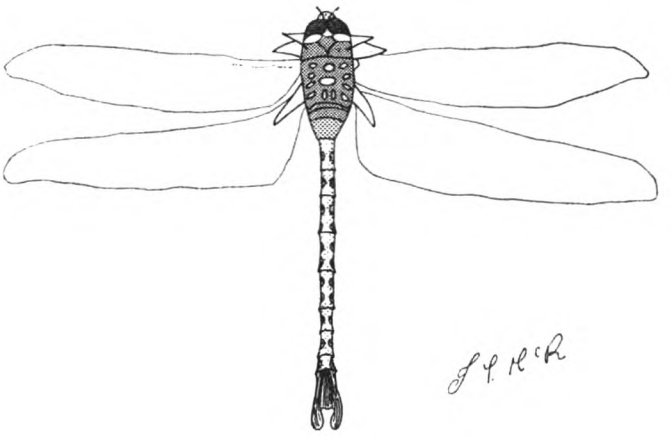


Politician



Historian

TWO SHIPS OWNED BY THE HARRISON LINE (*see* page 80).



The eyes were dark green and the mandibles were pale green. The thorax was predominantly bright bottle-green with a pattern of indentations on the back which was coloured in shades of green with two bright blue marks at the front. The abdomen and tail piece were light green with brown spots down the side and ended in a two-pronged fork which was tilted downwards. The underside of the thorax had a large orifice at the aft end which we took to be its reproductive organ.

Position of ship: 03° 12′N, 100° 48′E.

Note. Mr. P. Ward, Department of Entomology, Natural History Museum, comments:

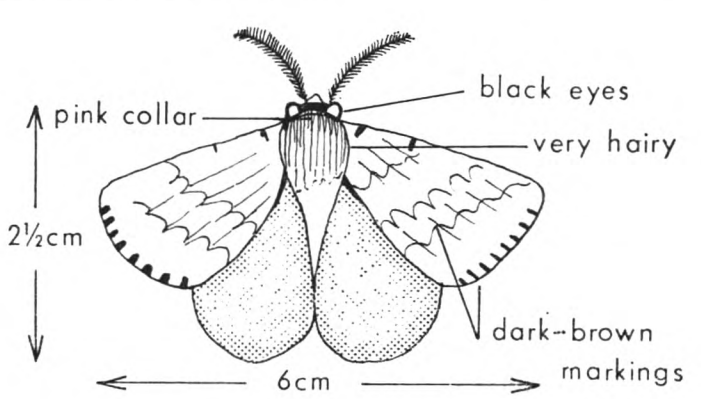
"The dragonfly (Odonata) is probably a member of one of the related genera *Anax* or *Hemianax*. The drawing is very good but, unfortunately, more than this is needed to make an identification. Even a first-class photograph is often impossible to name. Dragonflies of these genera are also well known as migrants and I have received several records of them being taken at sea."

South China Sea

s.s. *Bencairn*. Captain R. McPhee. Keelung to Hong Kong. Observers, Mr. W. F. P. Cargill, 2nd Officer and Mr. E. Chlechowicz, 2nd Radio Officer.

11th June 1973. At 0700 GMT a moth was caught on board. It had a hairy appearance with dusty, silky wings. When handled, the substance which came off the wings and body looked like very fine hair, velvety to the touch. The upper side was creamy-white with light-brown markings and dark-brown spots at the edge of the fore wings. The eyes and mandibles were black. On the underside there was a pink fringe at each joint of its body and the abdomen was pinky-red, all very hairy, including the legs.

Position of ship: 22° 48′N, 116° 42′E.



Note. Mr. A. Watson comments:

"This is a specimen of the family Lymantriidae (Tussock-moths). It is probably a species

of the genus *Lymantria*, but there are several species similar in pattern to the one illustrated and it would be necessary to examine the actual specimen before we could give a more definite identification."

AURORA

The following notes have been received from Mrs. Mary Hallissey of the Aurora Survey:

"The accompanying list gives a brief summary of the auroral displays reported by British ships during the three months 1st April–30th June 1973. The information has been extracted from logbooks at the Marine Division of the Meteorological Office or collected at the O.W.S. Base at Greenock and forwarded to us at the Balfour Stewart Auroral Laboratory of the University of Edinburgh. We welcome some new names to the list and the return of one after an absence of thirteen years.

"During the three months the number of disturbed periods of geomagnetic activity was high for this approaching minimum in the solar cycle, and there was also evidence of 27-day recurrence, viz. 31st March–2nd April/26th–29th April; and 16th–18th April/13th–15th May/10th–11th June. The expected associated aurora is of course difficult to confirm visually during May and June, with so few hours of darkness at our latitudes. A rayed form seen around midnight of 13th/14th May from Dyce and a single ray to beyond an observer's zenith in north-west Ireland in the early hours of 14th May were the only evidence of aurora expected to appear with the high geomagnetic activity indices then listed.

"Most activity, however, occurred during April. On 1st/2nd April coronal rays were overhead in southern Norway, northern and central Scotland; the display was seen by observers in the Weather Ships at 'India' and 'Juliett' and by aircraft crew over the Gulf of St. Lawrence area. Observers in s.s. *Botany Bay* and a Dutch ship, both in the same area of the Indian Ocean, confirmed simultaneous activity in the southern hemisphere.

"The displays at the end of the month were recorded by observers in m.v. *Sugar Producer* in the St. Lawrence River and in O.W.S. *Weather Surveyor*. In both instances the written notes were supplemented by very useful sketches. Those of Messrs. Barnes, Chaplin and Aran and the minute-by-minute report of the aurora on 26th/27th April from 0001 to 0400 give valuable detail of the development and progress of the display; the teabreak was surely a welcome interlude, as also the onset of cloudy conditions at 0400. The shortcomings of the reporting symbols or the rapid change of shapes possibly exasperated the observer at one stage when he gave up in despair and described the current position as an "amorphous mass (or mess!!)". He is in agreement with Professor Chamberlain in his book *Physics of the Aurora and Airglow* who, summarizing the salient features of auroral structure, writes that "during a strong aurora the sky often appears to be just a mess". Most places in the British Isles were cloudy on that night, 26th/27th April; only a lone observer in northern England and Meteorological Office staff at Stornoway saw anything of the display.

"We would remind you that Balfour Stewart Auroral Laboratory is also a data collection centre for noctilucent clouds, the optimum season for which at our latitudes is roughly end of May to early August, though at latitudes 63–65° they can be seen as late as the end of August. The clouds are thought to recede polewards in late summer, though the possibility of their appearance at certain other times of the year cannot yet be ruled out. We have only rarely had an observation recorded by a ship's observer, possibily partly due to recognition difficulty. The clouds are estimated to be at about 82 km. They appear against the twilight sky when the sun is 6–16° below the observer's horizon (optimum solar depression angle for their visibility being around 10°). The clouds are distinguishable from normal tropospheric clouds by the fact that they are brighter than the background of the twilight glow while normal clouds remain darker unless illuminated by moonlight. There is a widespread watch for these clouds in both hemispheres in order to help reveal the physical conditions existing at the 80 km level. A bright display of these clouds is a magnificent sight.

"We thank you again for your interesting reports and valuable help."

Date (1973)	Ship	Geographic Position		Λ	Φ	I	Time (GMT)	Forms
24th Feb.	*Echo*	52°39′N	05°58′W	080	56	+68	2030–2040	N
1st Apr.	*Botany Bay*	33°04′S	71°57′E	130	−42	−63	2005–2055	N
	Weather Reporter	58°58′N	19°08′W	070	65	+72	2245	HB, RB
2nd	*Weather Adviser*	52°33′N	20°02′W	060	59	+69	0140–0205	RA
							0400	N
14th	*Dart America*	44°18′N	62°38′W	010	56	+73	0700–0755	RA, RR
22nd	*Weather Surveyor*	62°16′N	33°17′W	060	70	+76	2325–2350	HB, RB
26th	*Sugar Producer*	47°20′N	70°32′W	360	59	+76	0225–0310	HB, RB, RR
		46°48′N	71°23′W	360	58	+76	0415–0450	HB, RA, RB, RR
27th	*Weather Surveyor*	61°59′N	32°35′W	060	70	+76	0001–0400	All forms
28th	*Weather Surveyor*	62°08′N	33°03′W	060	70	+76	0245–0340	HA, HB
29th	*Weather Surveyor*	62°11′N	33°06′W	060	70	+76	0003–0350	RA, RB, RR, N
1st May	*Weather Surveyor*	61°53′N	33°12′W	060	70	+76	0245–0305	HA
5th	*Weather Surveyor*	62°11′N	32°50′W	060	70	+76	0150–0330	HA

Key: Λ = geomagnetic longitude; Φ = geomagnetic latitude; I = inclination; HA = homogeneous arc; HB = homogeneous band; RA = rayed arc; RB = rayed band; R(R) = ray(s); N = unidentified auroral form.

551.582(268+712.2):629.12

Voyages to the Canadian High Arctic

By Edwin D. Rainbow
(Deputy Chairman, Institute of London Underwriters)

About 18 months ago a group of seven underwriters from three countries were invited to study at first hand the problems faced by ships voyaging to the Canadian High Arctic.

As might be expected, a preponderance of the ships in the High Arctic are Canadian and they are not likely to concern underwriters except those in North America and the United Kingdom. However, underwriters all over the world may tomorrow receive inquiries from an owner of their nationality who wishes to send a ship there and it is for them that it is hoped that this paper will provide information of interest.

The eastern Arctic shipping season does not begin until July and finishes before the end of October. The ships go north for three purposes. First, there is the re-supply of settlements with food, fuel and general merchandise, a requirement that grows steadily each year. Second, military bases are maintained as part of the defence strategy of Canada and the United States, activity that has remained at a constant level in the recent past. Canadian Government policy is to confine shipments in these first two categories to Canadian tonnage. Finally, equipment, food and fuel are required in increasing quantities in connection with exploration of the High Arctic. The ships carrying this category of cargo are aiding the search for ore, oil and gas deposits which are capable of economic exploitation at some future date. Not surprisingly, these voyages often involve pioneering calls at locations that underwriters, like the masters of the ships themselves, will not have encountered previously and it is these voyages that are likely to involve foreign ships and, therefore, foreign underwriters. A day will come when export cargoes of iron ore, oil and gas will begin to move to destinations overseas and here, too, foreign underwriters may expect increasing involvement.

The group of underwriters flew from Montreal to Frobisher, before going on to Resolute which is a mile or two from the magnetic North Pole.

Having been occupied during the winter in the River and Gulf of St. Lawrence, the Canadian Coast Guard fleet of five heavy icebreakers and six other smaller icebreakers moves into service in northern Canada. Availability of icebreakers is reduced, however, when a bad winter in the St. Lawrence delays them for overhaul. Usually many of them leave for the north early in the season to re-activate aids to navigation before making themselves available for escort duty. Survey and hydrographic work is still at an early stage in many areas which are still insufficiently charted and the icebreakers also undertake some of this work. Occasionally they carry cargo as part of the Arctic re-supply programme.

Ice information

Ice reconnaissance flights, with trained observers, begin well ahead of the shipping season. Other ice observers are assigned to the icebreakers, some of which carry a helicopter from which the observers can improve their range of observation. Both sources send daily reports to Ice Central in Ottawa where Bill Markham heads a team that edits the information in readiness for transmission by radio on specified frequencies that can be picked up by anyone requiring it. There is an ice-operations office at Frobisher Bay capable of contacting most of the ships at any time with ice information, including forecasts, suggested routes, and advice as to convoys and icebreaker support. The information service has been further strengthened by receipt of photographs taken by satellite which, when visibility is good enough, provide a view of remarkable clarity on a scale of 12 miles to the inch.

Résumé of the 1972 visit

Ice conditions in the High Arctic in 1972 were the worst for 20 years, but no difficulty was experienced in the early part of voyages north because the normal route off the west coast of Greenland was through open water, although care was required in view of the number of icebergs moving south nearer to the Labrador coast.

Lancaster Sound was open water, but the north and north-east coast of Baffin Island was experiencing severe ice conditions with on-shore winds holding the ice against the coast. Barrow Strait was open water up to 80 miles west of Resolute, where ice was found up to 1·8 metres thick, with 10 tenths coverage. We were on board the 3,823-ton Canadian icebreaker *Labrador* (*see* photograph opposite page 80) while she assisted the m.v. *Thuleland* on her way to Little Cornwallis Island. She was held up by an eight-mile barrier of ice, 1·2 metres thick, across McDougall Sound, but the icebreaker enabled her to complete the voyage.

Rather more difficult was the *Labrador*'s effort to reach the *Palva*, a tanker of 16,254 tons deadweight, which was in need of assistance. The *Palva* was carrying the total fuel requirements for the next 12 months for the Pan-Arctic base at Rea Point. Small vessels can follow closely behind an icebreaker, but there is a tendency to use larger vessels in the High Arctic which have both beam and length greater than the icebreaker that is ahead of them. Because of their greater length they are less manœuvrable and the icebreaker, instead of following a path through easier conditions, is required to attack multi-year ice in order to produce a straighter track. The icebreaker's bow rides up on the ice and the weight of the vessel cracks the ice on either side and sometimes for several yards ahead, depending of course upon the thickness and quality of the ice.

After 6 hours of slow progress, the *Labrador* herself, still 11 miles away from the *Palva*, became beset in thickening ice with large pressure ridges caused by the pushing together from different directions of two ice fields under the influence of wind and tides. The attempt to reach the *Palva* was abandoned until further icebreaker support could be obtained. It was 8 hours before the *Labrador* became free, illustrating the need for patience, awaiting the time when a change of wind, current or tide eased the pressures that were causing the ice to pile up in a ridge.

We returned to Resolute where the *Labrador*'s helicopter flew us back to the airport. We were already close to the magnetic North Pole, but an aircraft was available to take us still further north to see the ice conditions in Norwegian Bay, on the route to Eureka. A convoy of seven ships was heading for Eureka and, after a slow journey through Jones Sound and Hell Gate, it was completely beset in a vast area of ice in Norwegian Bay. The icebreaker *d'Iberville* (*see* photograph opposite page 81) had to await the arrival of the more powerful *Louis S. St-Laurent* to enable the convoy to reach its destination.

The 1973 season

The 1972 navigation season was the worst for 20 years. Last year it was a relatively mild one and here is the crux of the underwriting problem. It is very difficult to know much in advance whether the season will be mild or severe, but the shipowner contemplating a voyage to the High Arctic often needs to know the insurance cost 6, 9 or even 12 months in advance. For this purpose, average conditions for 10 years are a useful guide. It is easy to see from maps prepared by Ice Forecasting Central, Ottawa, why vessels proceed north on a track nearer to the coast of Greenland in the direction of Thule instead of choosing a route nearer to Baffin Island. It is also possible to see why Resolute became a settlement in preference to many other places because, even in mid-July, it can be reached with the maximum possible transit of open water.

By mid-September, for a few brief weeks, there is a reasonable chance of reaching Resolute without having to navigate through ice. In a specific season, however,

the 10-year average can be misleading. When we were at Resolute, any movement from there to the north took a vessel into 10 tenths ice almost at once, whereas on a map the area is shown to be open water far beyond the north of Cornwallis Island on which Resolute is situated.

The hazards are, of course, much greater than on the more conventional trade routes of the world. Shipowners are much more ready these days to operate vessels that are fully strengthened for navigation in ice but, even so, the extra premium ought to reflect much more than the risk of ice damage. The severe weather conditions and shortage of information on which to base reliable charts cannot be lightly dismissed when an underwriting judgement is to be made, despite great efforts by the Canadian Government to overcome these difficulties. Salvage tugs and repair facilities are absent. The future will bring further problems if plans go ahead to build submersible vessels to navigate beneath the ice.

We must keep our knowledge up to date as a contribution to the development of a region that will become increasingly important to us all.

Editor's note. The variability of ice conditions in the summer season was discussed in the article "Ice conditions through the North-west Passage", by R. M. Sanderson and G. P. Davis, published in *The Marine Observer*, April 1972, pp. 69–80.

Cunard Adventurer's Solar Eclipse

By J. S. Brooke
(First Officer, m.v. *Cunard Adventurer*)

Right from the start we knew this cruise was going to be different from any other. Letters, pamphlets, booklets, signals, forms and telex messages poured in until the file we were using gave up and they had to be tied up in an enormous parcel.

On 23rd June 1973 at San Juan, Puerto Rico, on came the passengers. They were certainly different, for among the more conventional-looking were those in faded, holed and patched jeans, some with bare feet, those with long flowing robes, one in dungarees with braces and a straw hat in true Mid-Western farmer style, and one even had a sheet with a hole cut in it for his head. (Incidentally this gentleman, later, on a windy day on the upper deck was advised that he ought to wear some additional clothing.) Many were carrying large odd-shaped parcels and boxes, one or two of which looked more like a do-it-yourself 4-inch gun kit. The watchful eye of the Security Petty Officer looked at them even more suspiciously than usual. In addition to those passengers a large Eclipse Cruise staff embarked, including professors of astronomy and one of astro-navigation; experts in ornithology, meteorology, oceanography, photography, space science and volcanology; the Director of Abrams Planetarium; the inventor of the communications satellite and co-author of the book and film *2001*; astronaut Captain Walter Schirra and also Russell Schweickart who was the lunar module pilot on Apollo 9 and commander of Skylab 1 back-up crew.

Our sailing was delayed until 0300 due to the late arrival of a passenger flight; even so our decks were crowded and the bars sparsely occupied, a situation that lasted right through the cruise.

The first port of call was Fort de France, Martinique and many of the passengers headed off to peer into Mont Pelée, the volcano that wiped out the entire 40,000 population of Saint Pierre (save one man in jail) in May 1902.

Then to Soufrière in Saint Lucia, a bay far too deep to anchor in although we were only 1 cable off shore. We landed most of the passengers by ship's launches to see the still-smouldering Mont Soufrière. Untold years ago the side of the volcano blew out which has now enabled it to be called the world's only drive-in volcano. The drive up 300 metres or so is rewarded by the unique inferno setting of bubbling pools and steam bursting out of cracks and vents in the rock. The *Cunard Adventurer* left her passengers to it and steamed along the coast to Castries harbour where they re-embarked.

Onwards to Trinidad: no volcanoes for them to see this time but there was the Royal Botanic Garden. Not for them the colourful West Indian bars and beautiful beaches for, although it lashed down with rain in the only way it can in a tropical climate, it did not stop our passengers heading for the Carona Swamp! Luckily, just before they had to return to the ship, the egrets and Scarlet Ibis returned to their nests in the trees which literally changed colour from green to white and scarlet as thousands of birds returned to the sanctuary.

Now we set off on the real business of the cruise, steaming due east out of the Caribbean at maximum speed to intersect the eclipse path and then, if any time was in hand, run along it. It required a 1,000-mile dash into mid-Atlantic. Nothing must slow us down; there was practically no leeway for any loss of speed. Not even the stabilizers were extended although their use would only have decreased the speed by a fraction of a knot. Music burst through the loud-speakers at the crack of dawn to wake people for the first lectures. They began at 0630 and continued right up till midnight. The Mayflower Room, instead of nightly cabarets and dancing, contained rows and rows of serious faces looking intently at a blackboard in

front of the stage. Every evening we 'darkened ship' to enable the astronomy and star-identification classes to observe the skies undistracted. It was said that the casino often had only one person playing at one of the four tables. Bridge visits were popular, however, in fact there can have been very few passengers who did not see the bridge. One visitor was Dr. Frances W. Wright, a very pleasant lady who lectures on astronomy and celestial navigation and in fact joined the ship with a dozen sextants!

By 0200 on Saturday, 30th June, we had reached the path of the eclipse (*see* Fig. 1) and began steaming along it. Now the only worry was cloud. There was certainly quite a bit around; luckily the weight was largely off the ship's meteorological officer as Norman J. Macdonald, a leading atmospheric physicist, had reams of messages, charts and maps from up-to-the-minute satellite data.

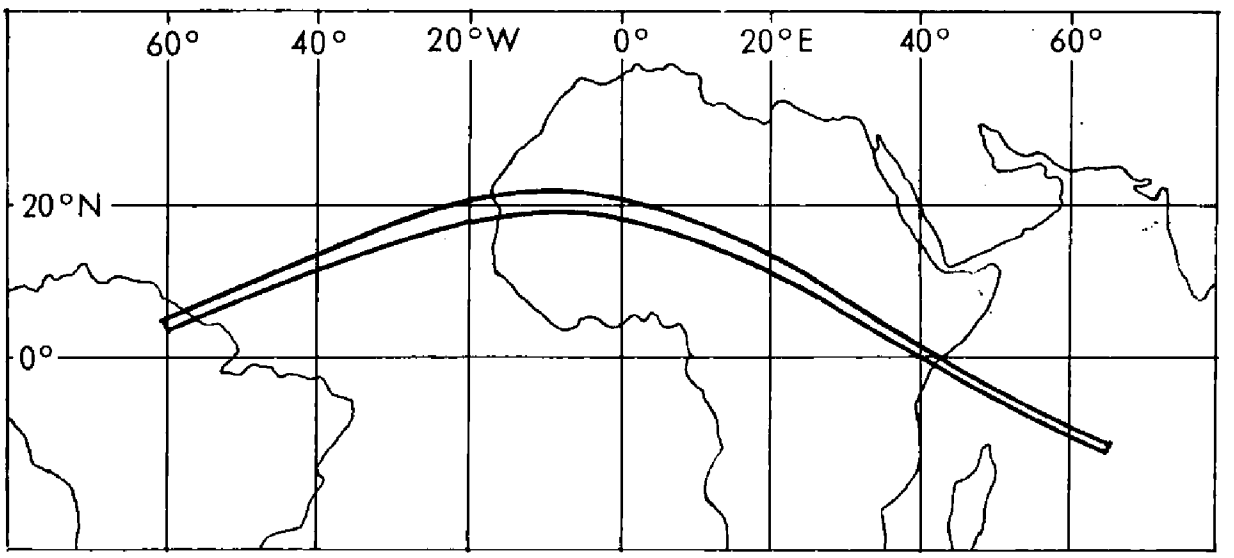


Fig. 1. Track of the total eclipse of the sun, 30th June 1973.

At 0600 the first contact was observed and the moon's shadow began to bite into the edge of the sun. The ship was stopped dead in the water at 11° 29'N, 43° 04'W and all the lifeboats on the port side were lowered to the rail so as not to interfere with the observations and photographs. All open decks were a mass of telescopes and cameras, in fact it was estimated that the equipment averaged out at well over $500 worth per person; some items costing many thousands of dollars included a video-tape camera used in conjunction with a closed-circuit television showing during the afternoon of the eclipse. Every passenger and nearly the entire ship's company were on deck by 0630, surely a sight never to be seen again. With the boats out and the decks packed we looked more as if our role was that of a troop transport rather than a cruise ship. The ship became deathly quiet as all air conditioning and fans stopped; in fact only one generator remained running for the bow thruster, gyro and essential services. Using only the bow thruster the sun was kept exactly on the port beam.

As the time moved on towards 0700 the enthusiasm and excitement became contagious and was soon caught up by the ship's company. The sun had become a crescent getting smaller all the time as second contact approached and the last glimpse of the sun disappeared. The elevation at this time was about 19½°. An incredibly bright white light took its place instantaneously which in turn became a beautiful diamond ring and the sky began to darken rapidly. The diamond ring quickly shrank to become Baily's Beads, a phenomenon caused by the last couple of seconds of sunlight shining through the valleys between the moon's craters. These Baily's Beads were observed from 5 to 6 o'clock on the edge of the moon before they vanished to be instantly replaced by the corona extending in all directions

from one to two suns' diameters. This corona threw a path of shimmering light briefly across the sea in the manner of a bright moon at night. Shadow bands, lasting a total of 42 seconds, ran from 12 to 6 o'clock, just fractionally ahead of second contact. They were faint, poorly defined, elongated and ripply. They were not sharp and colours were poor and indistinct.

This was it. Totality. The time exactly 0700 SMT (1000 GMT). It lasted 4 minutes, 1·3 seconds, the longest total solar eclipse for the next 177 years. The sky was not completely dark, perhaps slate-grey is a more apt description. The planets Mercury, Jupiter and Mars (which was particularly bright) were observed. Orion's Belt was also clearly visible as were most first magnitude stars. Many of the lesser stars were also sighted, especially above us; however, at lower altitudes no stars were visible at all. Faint rippling shadows were seen, by some, very briefly against the ship's white side at second contact. Totality, although over 4 minutes' duration, seemed to pass exceptionally quickly, giving way to third contact. This time the diamond ring was so bright on the limb that Baily's Beads were not observed. The planets and stars vanished and the sky rapidly lightened back to a normal clear sunny morning. Until then the silence had only been broken by the non-stop clicking of hundreds of camera shutters and cries of "Oh!" and "Ah!", but now there was a babble of excited voices all talking at once. On the bridge (and elsewhere I suspect) an excited interviewer gathered numerous people's impressions, feelings and opinions.

At 0800, about the time of fourth contact, the Eclipse Flag-raising Ceremony took place. First the Red Ensign then the Stars and Stripes were raised slowly with halyards taut; then, to great cheers, the special Eclipse Flag (a black moon with a yellow surrounding corona on a green background) was hoisted to the truck. This flag is beginning to acquire a tradition of its own, having been previously hoisted during a similar ceremony in the *Olympia* during her eclipse cruise in July 1972.

Then followed further ceremonial with the burial at sea of a time capsule containing various passengers' contributions for posterity—obviously a bit of fun showmanship on the part of the Eclipse Cruise staff as, to put it mildly, it will be some time before the capsule is found in 4,000 metres.

Suddenly the deck tremored beneath our feet as the ship came back to life; generators, fans and, most welcome of all, air-conditioning re-started. Lifeboats were hoisted and, as the ship gathered way, a course was set for Saint Thomas in the Virgin Islands, 1,350 miles away.

On the way back to the Caribbean the passenger programme continued to show a full day, every day, of courses and lectures. Scientific, cultural and social activities continued as before, now interspersed with a complete replay, on closed-circuit television, of the whole eclipse and the interviews held afterwards. Photographs and colour slides were produced by those with development facilities on board. Various presentations were made; the bridge received a truly remarkable photograph, 35 × 28 cm, of the eclipse.

Apart from the Eclipse Staff presentations we had our own to make to Captain P. Jackson, M.R.I.N. who had been in the ship since she was first commissioned and has been re-appointed as relieving Master of the *Queen Elizabeth 2*. By the Staff Captain's trickery and subterfuge Captain Jackson was induced to appear at the right time in the Petty Officers' Mess (and later the wardroom) for a barometer to be presented to him by Astronaut 'Rusty' Schweickart on behalf of the Petty Officers. Then the Chief Engineer, on behalf of the Officers, presented Captain Jackson with a Waterford Crystal decanter and matching glasses. The Chief Engineer, Mr. R. Bateson was nominated because he had been in the ship from her early construction. On both occasions all concerned wished Captain Jackson every success in the *QE2*, many toasts being drunk to this effect.

So to Saint Thomas and back to our familiar cruise route, only this time Saint Thomas was chosen in order to observe southern skies not visible from an American observatory. During the early evening we left our berth and anchored in the middle

of the bay to be in a good, unrestricted position to see the fireworks, thousands of dollars' worth, let off to celebrate the beginning of American Independence Day.

By 0200 on 4th July the fireworks were over and we slipped quietly out of harbour for an uneventful overnight passage to San Juan, Puerto Rico. We entered harbour with the Eclipse Flag flying for the last time at the truck. For us it was all over; the passengers left with their vast array of equipment, many bound for the Arecibo Ionospheric Observatory which has the world's largest radar/radio telescope. Among the farewells, as they disembarked, snatches of conversation drifted back. "What about the next eclipse . . .?" ". . . hear a ship is being chartered out of Australia." "Will you be on the 1974 one . . . shorter one though." "Won't be as good as the *Adventurer*'s of course."

551.5:629.12

Unorthodox Meteorology

By Captain J. M. A. J. W. Smit

(Port Meteorological Officer, Cape Town)

It happened way back in 1933 when we were on a voyage from Rotterdam via Singapore bound for Japan. I was just promoted to 2nd Officer and the Captain (who was the Commodore of the Fleet) had his mind still very much on windjammers where he had started his seafaring career and worked his way up from deck-boy. He himself could not see how it was possible for us, who were educated at a nautical academy, ever to become good captains.

On leaving Rotterdam the weather forecast was not promising and the Captain asked me "what the glass was doing". I told him that the pressure was falling and gave him the reading. He was not interested in that, but wanted to know what the meniscus looked like. This was new to me and I could not give him an answer. The Captain came along with me to the chart-room and, pointing to the meniscus, said, "I am not interested in rising and falling of the pressure, but if the meniscus is flat, as it is now, it will blow; and if it is rounded like a marble it will be calm". It did blow—a full gale.

I have watched it since and I must admit that the Old Man had a point. A possible explanation may be that the cohesion between the glass tube and the mercury changes with the static electricity of the air. Nevertheless it is not conventional to use the mercurial barometer only to watch the top of the mercury.

Another instrument I learnt to use in an unconventional way was the radio direction-finder. At that time it was not a law that ships of a certain tonnage must have a radio direction-finder to take bearings of radio stations to find the position. These instruments were put on board by the owners to obtain a discount on insurance premiums. The Captain did not believe in this instrument; and it must be said that in those days it was quite a performance. There was a considerable error if the position line was running parallel with the coast; sometimes so much so that the position line gave a fix well inshore. So for the old sea-dog this was out; but nevertheless he did find another use for it.

We left Singapore towards the end of August on the last lap for Japan. On the second day out I noticed that the barograph trace did not come up as high as twelve hours earlier but was still showing the six-hourly variations. This could be the first indication of a tropical disturbance and I brought it to the notice of the Captain. "What is the glass doing?" was his question, but there was still a good rounded meniscus. That evening the sun set deep red, with bands of cirrus running approximately east/west. There was not much swell; possibly we were sheltered by the Philippine Islands. The next day the barometer was falling slowly all the time. Coming north of the island of Luzon the swell increased and there was no doubt left. Also the Captain was convinced as the meniscus was flat. In fact the mercury was pumping so much that it was hard to say.

At this point the Captain took a bearing of the typhoon by making use of the radio direction-finder. This he did by tuning in on a medium wave between 600 and 800 metres and listening to the crackles in the earphone to get the loudest reception. By doing this the bearing is 90 degrees out, as one should take the bearing by hearing only a faint signal. Six hours later another bearing gave no change from the first one. This indicated a collision course with the disturbance. The next bearing, twelve hours from the first, showed a small change, indicating that the ship would come in front of the typhoon and so into the dangerous sector. This could well have been correct as our speed was just over 9 knots, and the movement of the disturbance in that latitude (between 18° and 20°N) should be in the region of

8 to 9 knots. At this point the ship was stopped and the typhoon was allowed to pass by.

The crackles heard in the earphones are the static electricity and lightning round the centre of the cyclone. This method may be not so well known, but it works and the old sea-dog knew it.

A CENTURY OF VOLUNTARY OBSERVING—THE HARRISON LINE

Our annual pictorial series of ships belonging to a company with whom we have been associated for more than a century is continued opposite page 69 with photographs of observing ships belonging to Messrs. T. & J. Harrison of Liverpool.

Our association with this company goes back to 12th July 1860 when our agent in Liverpool put instruments aboard their *West Derby* in Liverpool.

She was a wooden ship of 820 gross tons, built in Liverpool in 1855 and then commanded by Captain J. Sergeant for a voyage to Calcutta. Her maiden meteorological logbook is now out on permanent loan to the owners.

Unhappily no picture of the *West Derby* seems to have survived the years and, more unhappily still, she was the only Harrison's ship which we had in our registers for the next 45 years so the company's early years of voluntary observing have to go unillustrated. A point of interest, however, about those early years is that in 1866 Harrisons bought from J. Baines & Co. their famous clipper ship *Lightning*. We had first put instruments aboard this ship on 31st August 1855 when she was commanded by Captain Anthony Enright. She was thus one of our earliest observers and her maiden meteorological logbook is now in the National Maritime Museum, Greenwich. We received several meteorological logbooks from her over the next 10 years but none after she had passed to the new owners. Harrison's ran her on the same run, the Australian wool trade until October 1869 when, during her loading at Yarra Street pier, Geelong, she caught fire and, after burning all day, sank in about 27 feet of water; parts of her hull were still being dredged up years later.

The next one of Harrison's ships to observe for us was the *Gladiator* in 1905, Captain J. T. Falla, but no pictures of any of their observing ships are available until the *Politician*, Captain G. B. Wolfenden, the subject of our first picture. She was a four-masted schooner-rigged steamship of 7,228 gross tons built in 1899 by C. S. Swan, Hunter & Co. of Newcastle. Her maiden meteorological logbook was received here on 28th September 1911 and covered a voyage from Liverpool to Calcutta and home.

The newest of Harrison's ship to join the Voluntary Observing Fleet is the *Historian*, the subject of our second picture. Of 8,454 gross tons she was built in 1968 by the Doxford and Sunderland Ship Building and Engineering Company in their Pallion shipyard at Sunderland. She joined the Voluntary Observing Fleet under Captain R. P. Jones for her maiden voyage in December 1968.

We take this opportunity of placing on record our appreciation of the voluntary services which so many masters and officers in Harrison's have given us over the past century. There were, of course, many years between the *West Derby* and the

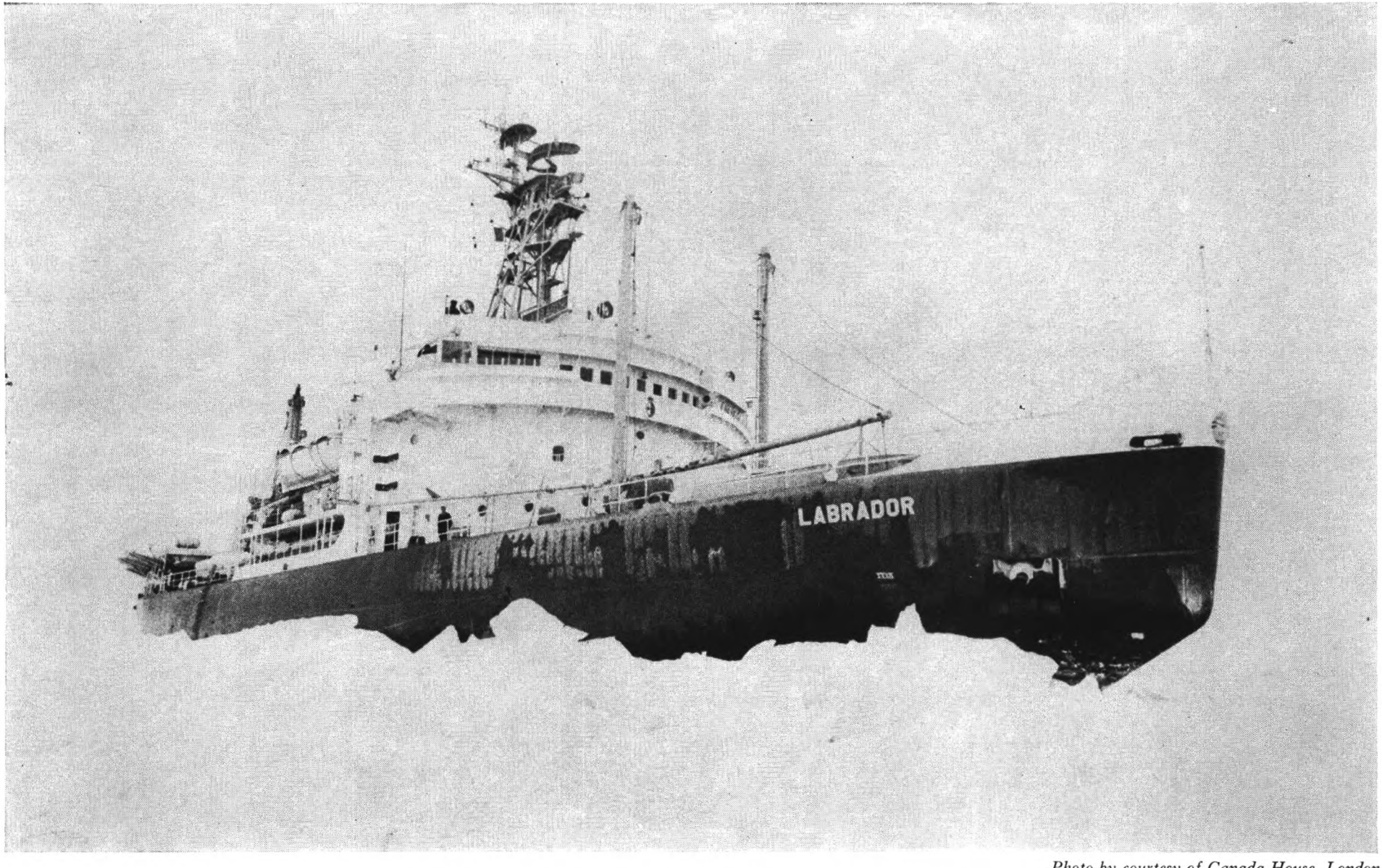


Photo by courtesy of Canada House, London

The Canadian Coast Guard icebreaker *Labrador* (*see* page 73).

(*Opposite page* 80)

(*Opposite page* 81)

Photo by courtesy of Canada House, London

The Canadian Coast Guard icebreaker *d'Iberville* (*see* page 73).

Gladiator when we had no observations from them but from the time of the latter we have seldom, if ever, been without at least one of their ships on our voluntary observing list; today there are fourteen.

L. B. P.

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM OCTOBER TO DECEMBER 1973

The charts on pages 82 to 84 display the actual and normal ice edges (4/10 cover), sea-surface and air temperatures and surface-pressure anomalies (departures from the mean) so that the abnormality of any month may be readily observed. (The wind anomaly bears the same relationship to lines of equal pressure anomaly as wind does to isobars. Buys-Ballot's law can therefore be applied to determine the direction of the wind anomaly.) Southern and eastern iceberg limits will be displayed during the iceberg season (roughly February to July). In any month when sightings have been abnormally frequent (or infrequent) this will be discussed briefly in the text.

The periods used for the normals are as follows. Ice: Eurasian sector, all data up to 1956,[1] North American sector, 1952–56 (for north of 68°N)[1] and all data up to 1963 (for south of 68°N).[2] Surface pressure: 1951–66.[3] Air temperature, 1951–60.[4] Sea-surface temperature: area north of 68°N, 1854–1914 and 1920–50,[5] area south of 68°N, 1854–1958.[6]

October

The south-south-easterly wind anomaly over the eastern Canadian Arctic, together with higher than normal temperatures over the Canadian Archipelago, resulted in a large deficit of ice over Foxe Basin and Baffin Bay. Temperatures were below normal from east Greenland eastwards to the European Russian Arctic due to the cold north-west to north-easterly wind anomalies between Greenland and Severnaya Zemlya (North Land). There was more ice than usual over the Denmark Strait and the Greenland and Barents Seas.

November

The Canadian Arctic continued to be warmer than usual, giving large deficits of ice over Hudson Bay and Strait, though there was a slight excess over Baffin Bay. Temperatures were well below normal again from east Greenland to Severnaya Zemlya, this time due to cold north-east to easterly wind anomalies, thus maintaining the excess of ice from Denmark Strait to the Barents Sea.

December

The northern and eastern Canadian Arctic continued the the warmer traits of the previous two months. Despite this a slight excess of ice over Baffin Bay was maintained, probably due to the Baffin Current and slacker winds as a whole. However, the formation of ice off the Labrador coast was slower than usual. Wind anomaly conditions between east Greenland and Severnaya Zemlya were similar to those in October and the excess of ice was maintained over Denmark Strait and the Greenland and Barents Seas. Over the rest of the area—from the west coast of Novaya Zemlya to the White Sea and in the Gulf of Bothnia—conditions were near normal.

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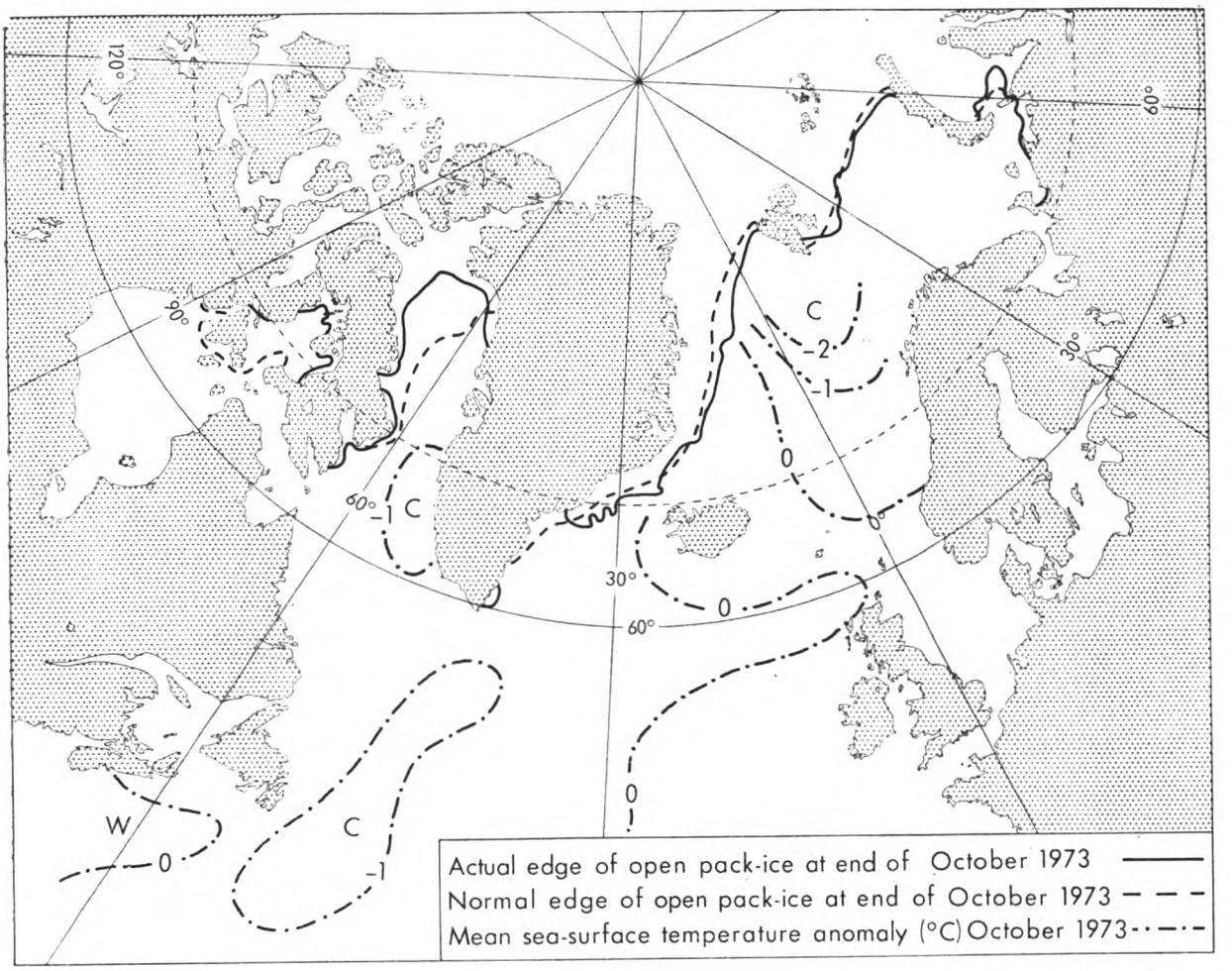
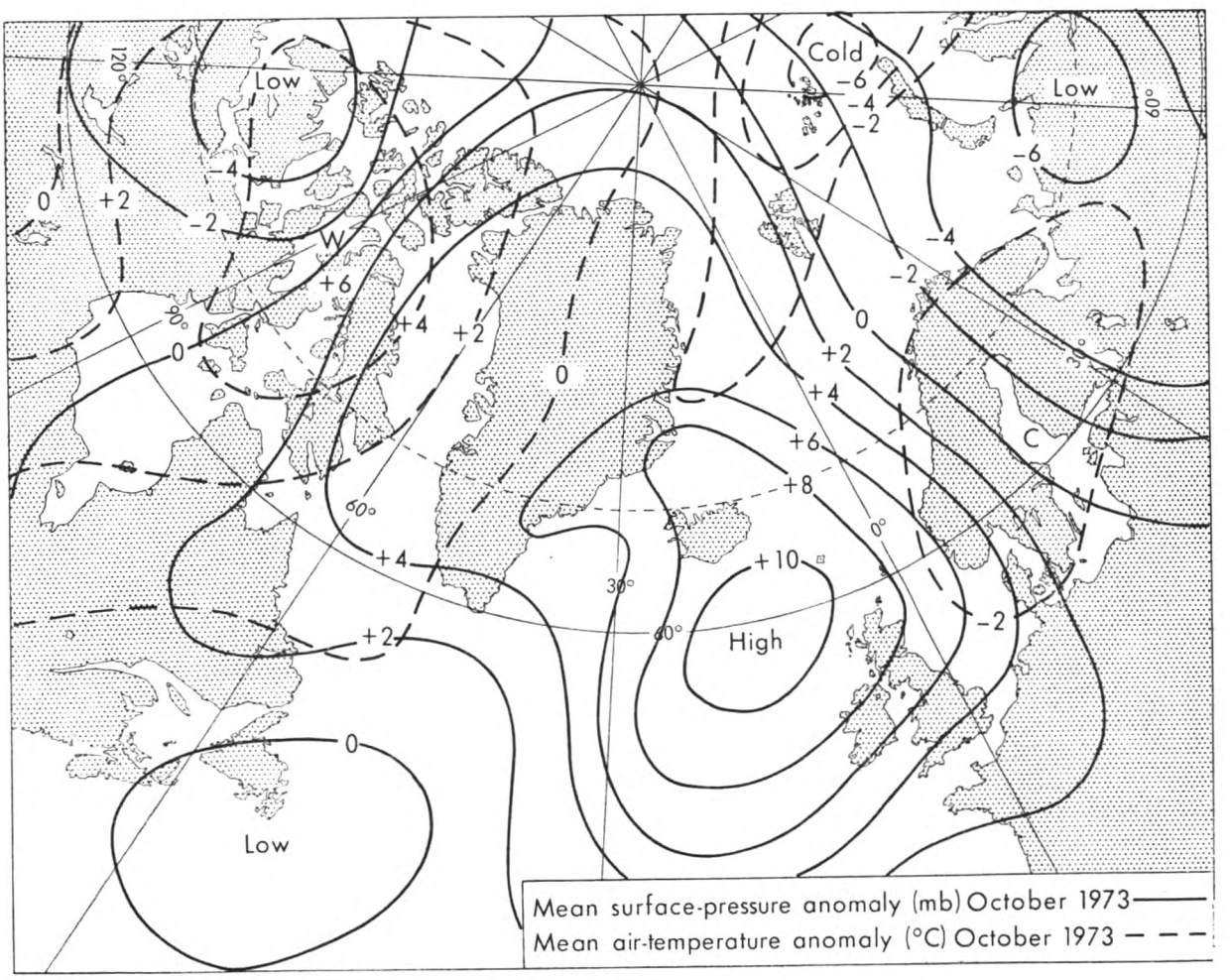
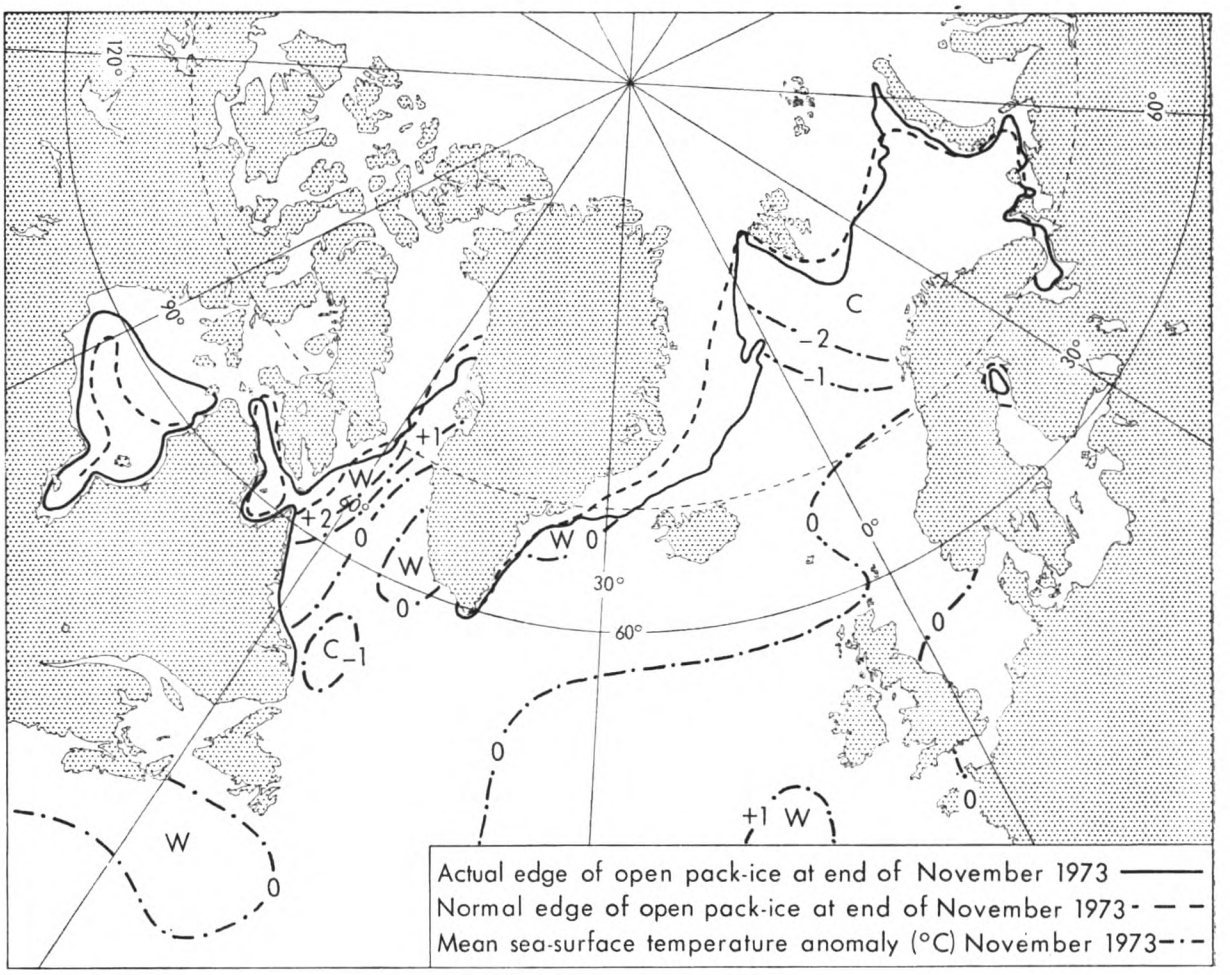
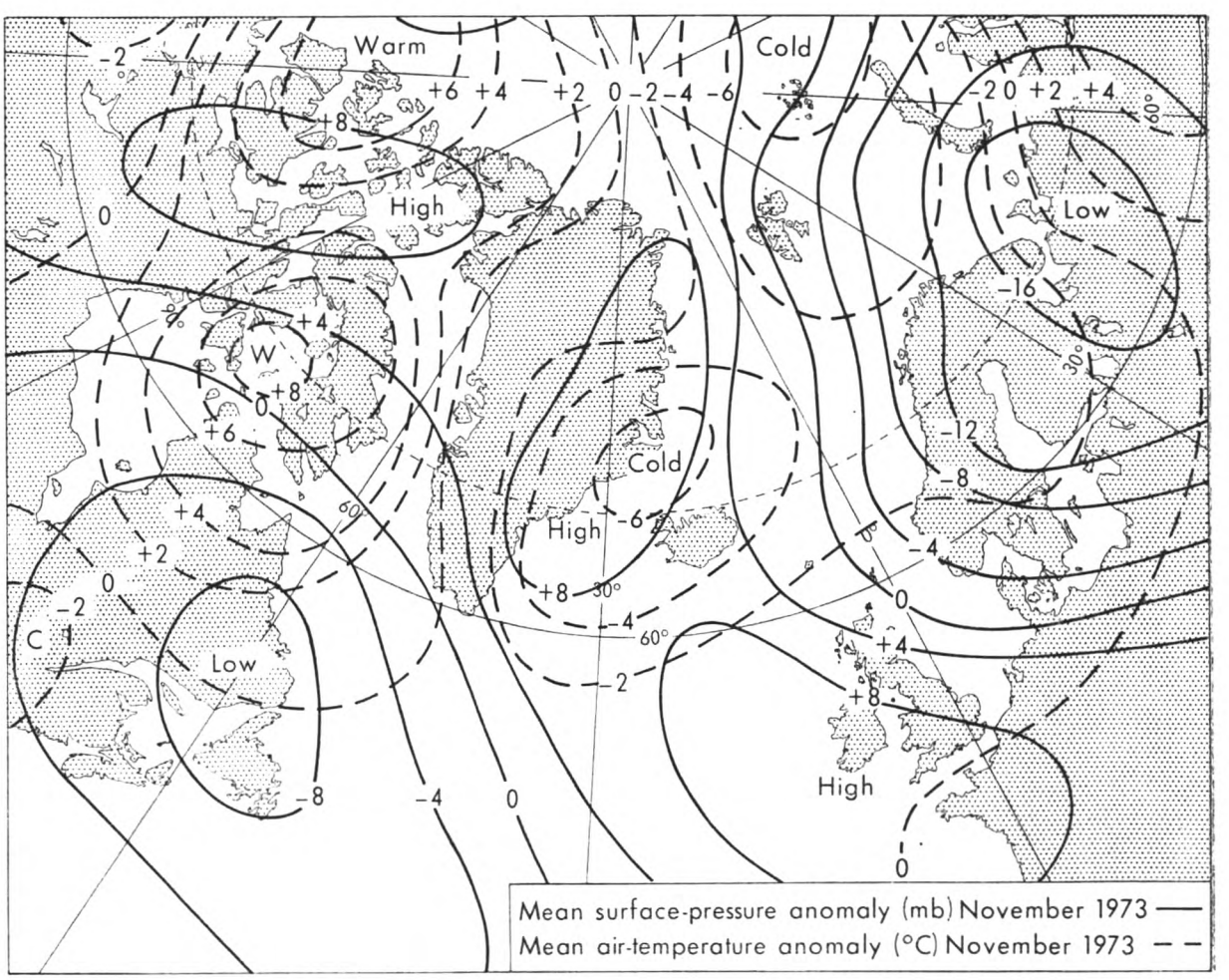
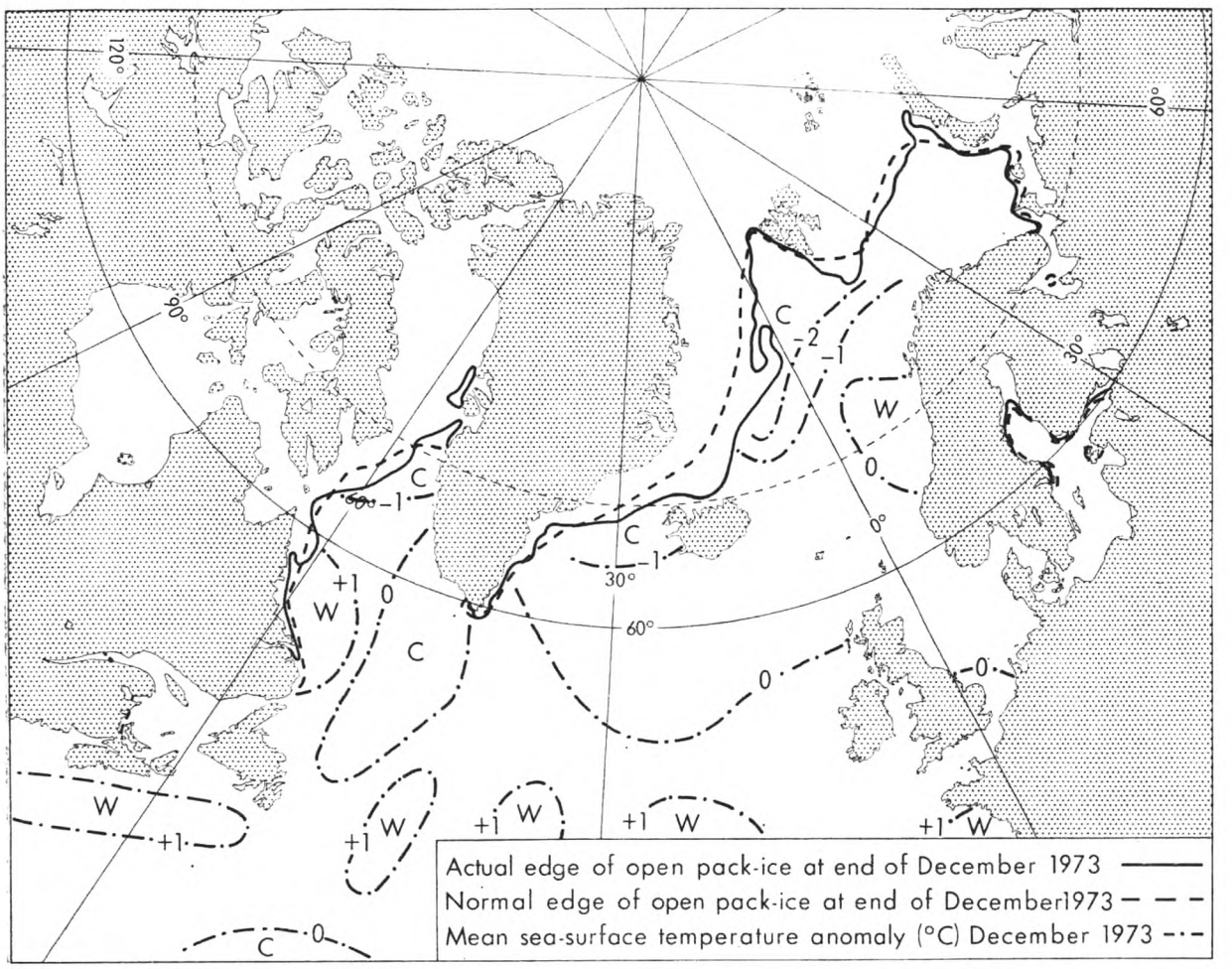
6. Washington, D.C., U.S. Naval Oceanographic Office. Oceanographic atlas of the North Atlantic Ocean. Pubn. No. 700, Section II: Physical Properties, 1967.

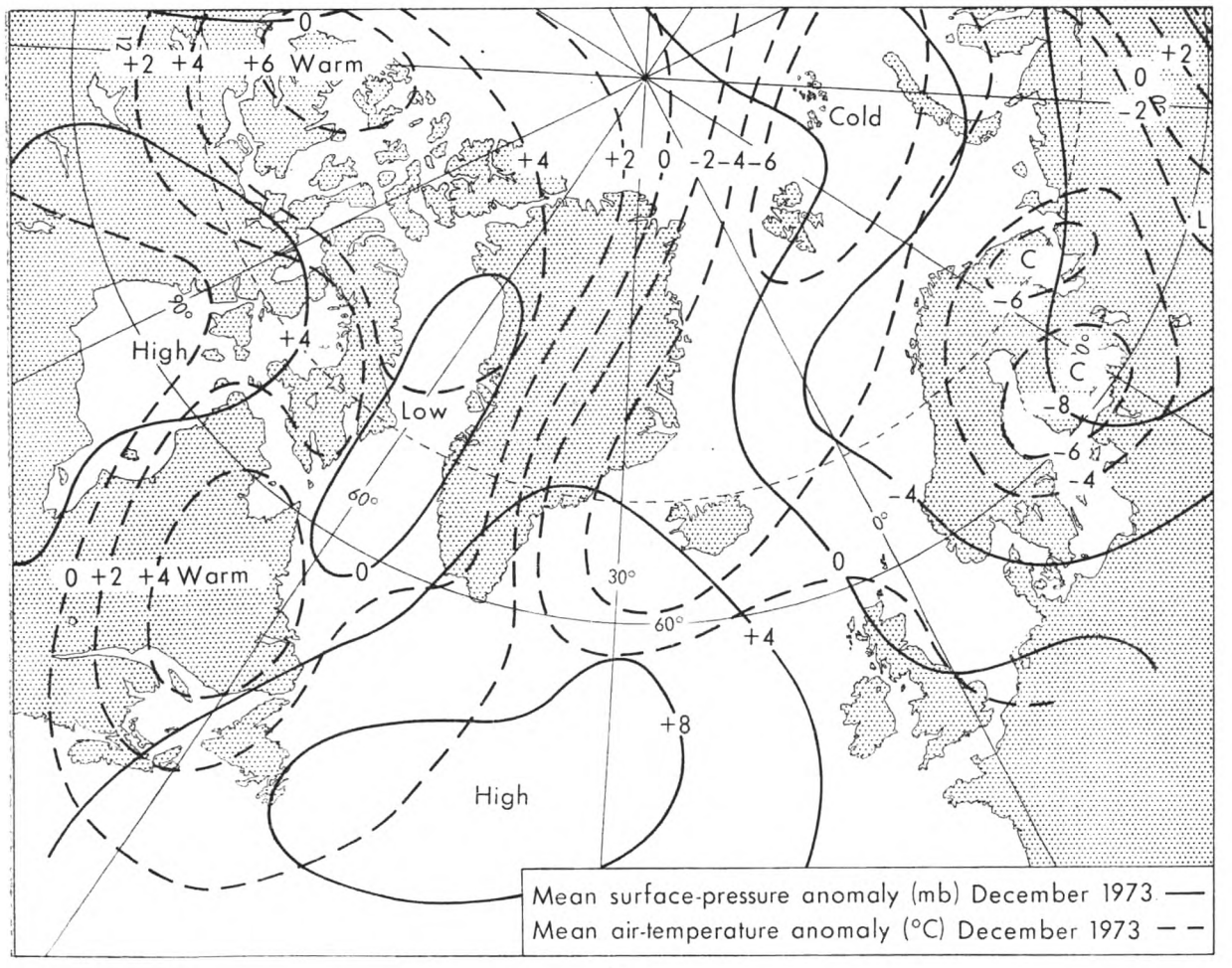

120°
90°
60°
30°
60°
C
-2
-1
0
C
-1
0
0
W
0
C
-1
Actual edge of open pack-ice at end of October 1973
Normal edge of open pack-ice at end of October 1973
Mean sea-surface temperature anomaly (°C) October 1973


120°
Low
Cold
-6
-4
-2
Low
60°
-6
0
+2
-2
-4
W
+6
-4
-2
90°
0
+4
+2
0
+2
+4
+6
+8
C
60°
+4
+10
0°
30°
+2
60°
High
-2
0
Low
Mean surface-pressure anomaly (mb) October 1973
Mean air-temperature anomaly (°C) October 1973


120°
90°
60°
30°
0°
C
-2
-1
0
+1
W
+2
C -1
+1 W
Actual edge of open pack-ice at end of November 1973
Normal edge of open pack-ice at end of November 1973
Mean sea-surface temperature anomaly (°C) November 1973


Warm
Cold
High
Low
Cold
High
Low
High
-2
+6 +4 +2 0 -2 -4 -6
-2 0 +2 +4
+8
0
+4
W
+6
-16
-12
-8
-4
+2
-2
C
-8
-4
0
Mean surface-pressure anomaly (mb) November 1973
Mean air-temperature anomaly (°C) November 1973


120°
90°
60°
30°
0°
C
W
+1
0
-1
-2
Actual edge of open pack-ice at end of December 1973
Normal edge of open pack-ice at end of December1973
Mean sea-surface temperature anomaly (°C) December 1973


+2 +4 +6 Warm
Cold
+4
+2 0 -2-4-6
High
Low
0 +2 +4 Warm
+8
High
+2
0
-2
L
C
-6
-8
-4
Mean surface-pressure anomaly (mb) December 1973
Mean air-temperature anomaly (°C) December 1973

Baltic Ice Summary: October–December 1973

No ice was reported at the following stations during the period: Riga, Ventspils, Tallin, Mariehamn, Kalmar, Göteborg, Visby, Emden, Lubeck, Hamburg, Bremerhaven, Kiel, Flensburg, Stettin, Gdansk, Stralsund, Rostock, Aarhus, Copenhagen, Oslo, Kristiansandfjord.

No ice was reported at any of the stations during October.

Station	November									December								
	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Leningrad ..	21	30	10	7	3	10	0	0	90	1	31	31	25	6	4	27	0	296
Pyarnu ..	26	30	5	4	0	3	1	0	—	1	31	31	31	0	5	26	0	—
Viborg ..	21	30	10	10	0	3	7	0	—	1	31	31	31	0	0	31	0	—
Klaipeda ..	29	30	2	0	0	0	0	0	—	1	17	6	0	3	4	0	0	—
Helsinki ..	0	0	0	0	0	0	0	0	81	1	31	31	12	12	30	0	0	281
Turku ..	0	0	0	0	0	0	0	0	108	9	18	10	0	0	10	0	0	298
Mantyluoto	0	0	0	0	0	0	0	0	—	2	31	30	0	0	7	3	0	—
Vaasa ..	17	30	14	10	0	10	0	0	146	1	31	31	31	0	18	13	0	434
Oulu ..	13	30	18	14	0	13	5	0	—	1	31	31	31	0	0	31	0	—
Roytaa ..	18	30	11	0	0	9	0	0	—	1	31	31	0	26	3	27	0	—
Lulea ..	19	30	12	12	0	12	0	0	270	1	31	31	31	0	6	25	0	631
Bredskar ..	0	0	0	0	0	0	0	0	—	1	31	29	6	5	6	17	0	—
Sundsvall ..	0	0	0	0	0	0	0	0	—	3	28	13	0	0	7	0	0	—
Stockholm ..	26	30	5	0	0	5	0	0	59	1	31	31	29	0	31	0	0	140
Skelleftea ..	25	30	6	0	0	0	0	0	0	1	31	29	20	0	0	25	0	—

CODE:
A First day ice reported.
B Last day ice reported.
C No. of days that ice was reported.
D No. of days continuous land-fast ice.
E No. of days of pack-ice.
F No. of days dangerous to navigation, but assistance not required.
G No. of days assistance required.
H No. of days closed to navigation.
I Accumulated degree-days of air temperature (°C) where known.*

* These figures give a rough measure of the first probability of the formation of sea ice, and later the progress of the growth and its thickness. They are derived from daily averages of temperature (00 + 06 + 12 + 18 GMT) and are the sum of the number of the degrees Celsius below zero experienced each day during the period of sustained frost.

Personalities

RETIREMENT.—Captain S. K. Williams of the Clan Line has retired from the sea after bringing the *Clan Maciver* home.

Samuel Kent Williams, of Caernarvonshire stock, was born in Gravesend, Kent in 1914, his father, a master in sail, being with the Port of London Authority. Captain Williams, wishing to go to sea, could not get an apprenticeship during the slump of the 1930s so he joined his first ship, the *North Anglia* of H. Roberts of Newcastle, as an ordinary seaman in October 1931. After serving before the mast with various companies he obtained his 2nd Mate's Certificate and joined the *Dalcairn* of Campbell Bros. of Newcastle in August 1937.

When Chief Officer of the *Zarian* in December 1942 the vessel was torpedoed off West Africa and he was picked up by H.M.S. *Milne*. For a further 18 months he traded on the West African coast and was appointed to his first command, the *Eketian*, in 1945.

In February 1947 he joined the *Busen Star* of Star Whaling Ltd. as he always had a great desire to visit the Antarctic. Then in 1953 he joined Hector Whaling Ltd. in command of the *Busen Rollo*. In 1961 Hector Whaling was taken over by the Clan Line and in 1967 Captain Williams transferred to cargo ships where he has served ever since.

Captain William's record of voluntary observing goes back to January 1955 when he sent in his first logbook from the *Busen Rollo*. In the 12 years of voluntary observing to his credit he has sent in 29 logbooks of which 7 were classed as Excellent and he received an Excellent Award in 1958.

We wish him health and happiness in his retirement in North Wales.

J. C. M.

THE LIGHTER SIDE

Extract from a recent meteorological logbook from the *Buccleuch*:

Gentle zephyrs blowing light,
Round the wheel-house doors tonight,
You're just a poor pathetic One
But Washington forecast you as Ten,
Frobisher said that you'd be Eight,
Bracknell said that you'd abate.
Oh! Great Met Man in the sky
Upon which should we rely?
Guide me, O Thou great Jehovah,
Safely till this trip is over.

A plea from the *Dart Atlantic*:

Harold said we'd have it made
If we changed to Centigrade.
Out go the feet, in come the metres,
Pints of beer to parts of litres.
I do not like this sorry plight.
Go back, Ted, to Fahrenheit.

During the afternoon watch the sea bucket from the *Fourah Bay* became entangled in the gangway. A tug on the line parted it and the bucket fell into the sea. The cadet who was taking the sea temperature left this note:

Alas, dear P.O.O., there's something you ought to know:
Our shiny new sea bucket that was in tow
Has vanished into the Atlantic deep,
Lost without trace. Oh! I could weep.
I imagine that you will want the cause.
My opinion is a faulty hawse.
I hope you'll see 'twas no fault of mine,
Just a bit of second-rate twine.
Now you're thinking what to tell the Met.
To flee the country is our best bet,
Otherwise they'll send down the 'Bracknell Boys'
To seek revenge for losing their toys.

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