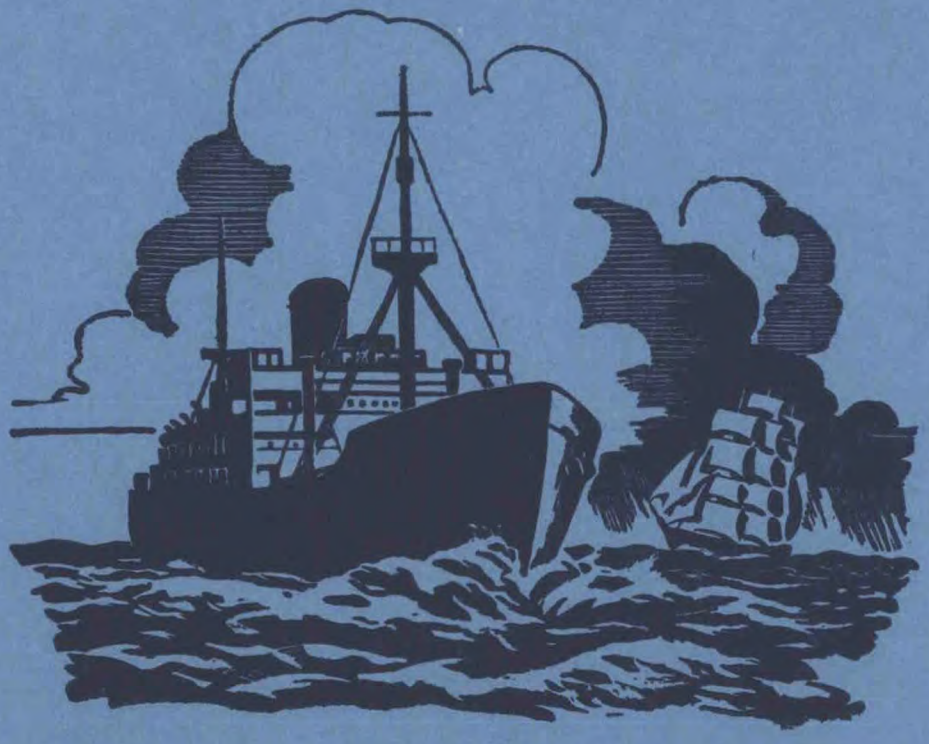
Met.O. 879

The Marine Observer

A quarterly journal of Maritime Meteorology



Volume XLV No. 248

April 1975

PRICE 60p NET

Met.O. 879

THE MARINE OBSERVER

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

VOL. XLV No. 248 APRIL 1975

CONTENTS

Letters to the Editor, and books for review, should be sent to the Editor, "The Marine Observer," Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2UR

Published for the Meteorological Office by
HER MAJESTY'S STATIONERY OFFICE

To be purchased direct from H.M.S.O., at any of the following addresses: 49 High Holborn, LONDON, WC1V 6HB; 13a Castle Street, EDINBURGH, EH2 3AR; 41 The Hayes, CARDIFF CF1 1JW, Brazennose Street, MANCHESTER, M60 8AS; Southey House, Wine Street, BRISTOL BS1 2QB; 258 Broad Street, BIRMINGHAM, B1 2HE; 80 Chichester Street, BELFAST BT1 4JY, or from booksellers

PRICE 60p NET or £2·60 per annum (including postage)

Report of Work for 1974

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

Voluntary Observing Ships

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

(*a*) 538 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*) 47 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*) 50 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. Report 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*) 6 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*) 15 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.

The numerical strength of the Voluntary Observing Fleet has remained almost static throughout the year. Most of the effort of building up the strength of the Fleet rests on the six Port Meteorological Officers at Glasgow, Liverpool, Hull, Cardiff, Southampton and London. They have found that frequently the number of new recruitments is equalled by the number of withdrawals when ships are sold or laid up for long periods. Nevertheless, the number of observations received has increased because the fast container and bulk-carrier type vessels spend more time at sea than their predecessors and are therefore able to make a greater number of observations. The Port Meteorological Office staffs have continued their liaison work between the Meteorological Office and the various shipping companies, to their mutual benefit. Apart from the few special purpose Ocean Weather Ships, meteorological work at sea in British merchant ships has always been carried out on a voluntary basis and it is gratifying to note that the standard of observing has been, in general, well maintained throughout the year. Where a deterioration has been noted it has almost invariably been found in ships which are now sailing with smaller crews. This, unfortunately, may become more serious in the future in the continuous search for ways to reduce the number of qualified and experienced personnel in modern ships; the practice of changing officers at four-monthly intervals accentuates the problem. The policy of appointing Port Meteorological Officers who are Master

Mariners with considerable experience as voluntary weather observers contributes significantly to the scheme and proves to be extremely helpful to the shipping industry. The installation of distant-reading meteorological equipment in a number of ships under construction, in order to ease the work load of observing officers, has continued with the whole-hearted support and co-operation of shipowners.

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. In addition to those listed, there are 3 ships serving the oil and gas industries, 11 Oceanographic ships and 5 Geognostic ships in the Fleet.

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

Europe	35	West Indies	31
Australasia	67	South America	23
Far East	85	Pacific Coast of North America	9
Persian Gulf	34	Falkland Islands and Antarctic	2
South Africa	40	World-wide 'tramping'	130
West Africa	12	Near and distant-water fishing grounds	22
North Atlantic	74		

Once again the Marine Division acknowledges its debt to many Commonwealth and foreign Port Meteorological Officers for holding a small stock of instruments for the replacement of defective equipment on U.K. observing ships which call at distant ports while away from home on protracted voyages, and for withdrawing instruments from ships which have been sold during their voyage. As these sales become more frequent the value of such timely intervention of Port Meteorological Officers overseas to prevent the loss of instruments is enhanced, especially when advance notice is not always given for such transactions.

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.

Ocean Weather Ships

The present four British Weather Ships, ex 'Castle' class frigates built for the Royal Navy in 1944, have now been in service as weather ships for about 15 years. In spite of increasing difficulty in manning at both officer and rating level these ships continue to give reasonably satisfactory service although, as a natural consequence of their age, repair and maintenance costs continue to mount. These ships manned Stations 'India' and 'Juliett' continuously and co-operated with the Netherlands and Norway in occupying Station 'Alfa' part time until 30th June, after which the station was unmanned.

The rules and regulations governing the equipment and operation of the weather ships are administered 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, sea temperature and salinity down to considerable depths, magnetic variation and surface sea-water sampling. The biological sampling programme for the Institute for Marine Environmental Research was continued throughout the year, the Longhurst/Hardy plankton recorder being used to determine the vertical distribution of plankton in the 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

Table 2. Total number of reports received at Bracknell by various sources from ships during two typical days in 1974

	JUNE	*NOVEMBER*
Direct reception from		
British ships in eastern North Atlantic	99	102
Foreign ships in eastern North Atlantic	48	46
British ships in North Sea	58	42
Foreign ships in North Sea	2	12
British ships in other waters	2	0
	209	202
Via other European countries		
Ships in eastern North Atlantic	415	353
Ships in Mediterranean	52	32
Ships in North Sea	96	151
Ships in Pacific	0	2
Ships off northern Russia	26	7
Ships in other waters	136	78
	725	623
Via North America		
Ships in North Atlantic	510	377
Ships in North Pacific	890	552
Ships in other waters	216	260
	1616	1189

of toxic residues in the plankton were made. In the latter part of the year the Marine Aerosol Sampling Programme commenced; this is a project undertaken in co-operation with the Royal Navy (National Gas Turbine Establishment, Naval Marine Wing) to obtain and analyse air samples for salt particle content.

Communication and navigational facilities were available from all British Weather Ships for transatlantic aircraft and air-sea rescue equipment was kept in a constant state of readiness. Search and rescue exercises were frequently carried out in which Nimrod aircraft of the Royal Air Force sometimes participated.

Ship routeing

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. The administration of this service was transferred to the Marine Division on 1st October.

During the year about 200 ship routeings were made for the North Atlantic and about 54 for the North Pacific.

When guidance is given on the advisory routes or courses to steer, the requirements which have to be satisfied depend upon a variety of factors which include the type of vessel, the cargo and the operating costs. In general, these requirements are for crossings to be achieved in as little time as possible, compatible with the need to avoid weather and wave conditions liable to cause damage to the ships and their cargoes. The operating costs of oil tanker companies are very high and therefore the normal requirement is for the least-time passage. An added consideration during the year is that operating costs have rocketed due to fuel price increases; therefore the need to conserve fuel by running at the most economic speed has to be taken into account.

General

The Marine Division was responsible for the survey and charter negotiations for two small vessels, the *Charterer* and the *Endurer*, which formed part of the U.K. contribution throughout the GARP Atlantic Tropical Experiment from 15th June to 30th September.

General services to shipping via BBC Radio and the Post Office coastal radio stations continued as in previous years, but to avoid conflict with the international 'silence' periods the times of broadcast of the first two bulletins of the day on Radio 2 were changed to 0033 and 0633. A proposal to change the order of the coastal station reports in the bulletins was referred to the Department of Trade for consideration by the industry.

A meeting was held with representatives of the Scottish Inshore White Fish Producers' Association Ltd. in October to discuss proposals to ameliorate the problem of poor reception of the shipping bulletins in certain sea areas around Scotland. It was agreed that a Gale Warning summary for all sea areas north of 55°N would be added to the Scottish Radio 4 Inshore Waters forecast pending a longer-term review of the whole problem.

Inquiries

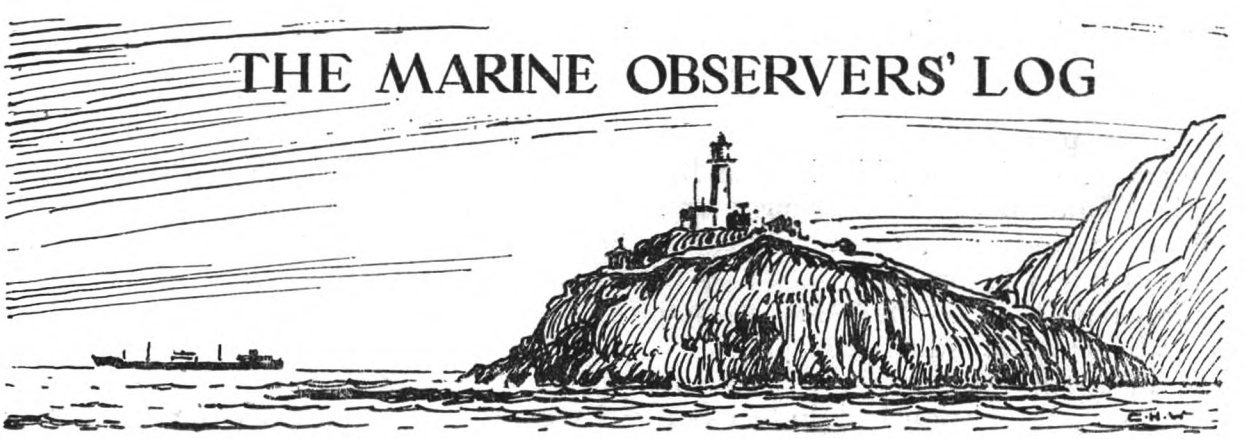
There was a record number of inquiries during the year, nearly 50 per cent more than in 1973. The majority concerned the normal weather hazards of fog, gales, waves and ice, and their effect on shipping schedules, damage to cargoes, a number of sinkings and a few disappearances at sea—notably the trawler *Gaul*. Oil companies and their subsidiaries made many requests for information on weather in the North Sea and Celtic Sea.

Among the miscellaneous inquiries was one for weather in the Solent for 1st–2nd November 1799 from a sub-aqua club whose members wished to find a ship wrecked at that time. After that, a request for information on gales in the northern Irish Sea during 1919 seemed but yesterday.

Awards to Voluntary Observing Ships

'Excellent' awards were made, as customary, to the masters, principal observing officers and radio officers of the hundred Selected and Supplementary ships which had sent in the best logbooks during the year. Seven distant-water trawlers were included in this list. Similar awards were made to the officers of four ships in the coastwise and short sea trades ('Marid' ships) and also to the seven trawler skippers and seven radio operators whose work for us in high latitudes deserved special recognition. Barographs were presented to four shipmasters for their long and meritorious work at sea.

The books selected for awards were *The University Atlas*, *Pears Cyclopaedia* (1973–4) and the Reader's Digest/A.A. *Book of the Road*.



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.

TROPICAL STORM 'DINAH'

Western North Pacific

s.s. *Benalder*. Captain A. McKenzie. Southampton to Tokyo via Cape of Good Hope. Observers, the Master and ship's company.

5th–8th June 1974. Whilst on passage, in fine weather, through the Lombok and Macassar Straits on the 5th and 6th the fax charts indicated the presence of a tropical depression in the western Pacific which might, at a later date, hinder the vessel's progress.

By 0500 GMT on the 7th the vessel was off the south-east tip of Mindanao and there were conflicting reports about the position and movement of the storm centre and little detail of its intensity. Tokyo indicated that at 0001 the centre was at 12°N, 136°E, moving NW at 10 kt. At 1100, in position 08° 19′N, 127° 14′E, the vessel changed course to 010°T to give the depression a wider berth.

When the weather deteriorated, 2-hourly observations were made and transmitted. The following are selected extracts from the logbook and the deck log:

7th

GMT

1200: Air temp. 27·4°C. Pressure 1009·2 mb. Wind WSW, force 3. Overcast with slight rain. Slight sea.

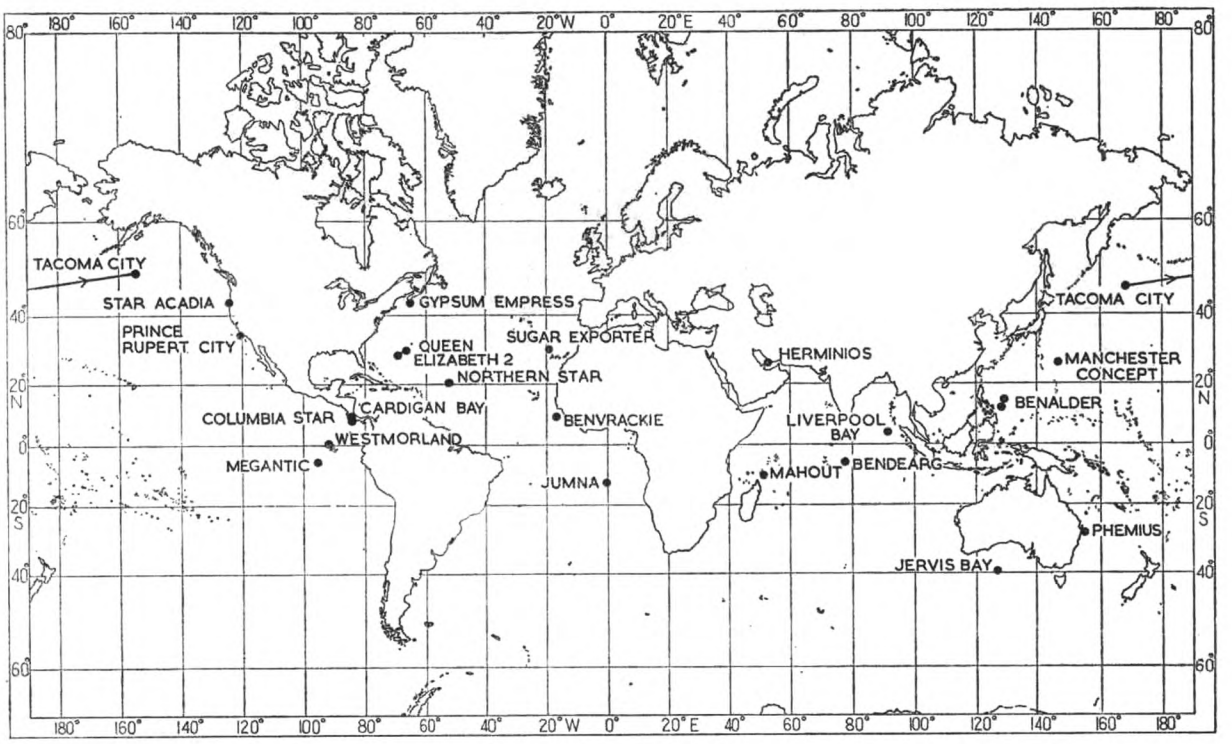
1300: Pressure 1008·6 mb. Wind NW'W, force 4, gusting to force 7.

1500: Pressure 1007·1 mb. Wind NW'N, force 6–7.

1600: Air temp. 27·5°. Pressure 1007·3 mb. Wind WNW, force 7. Overcast with occasional light rain. Slight beam sea. Low swell.

1630: Air temp. 27·4°. Pressure 1006·5 mb. Wind WNW, force 6, decreasing to force 5 at times.

1700: Air temp. 27·5°, sea 28·0°. Pressure 1006·2 mb. Wind W'N, force 3. Vessel encounters violent rain squall. Wind gusting to force 7–8. Pressure still falling.



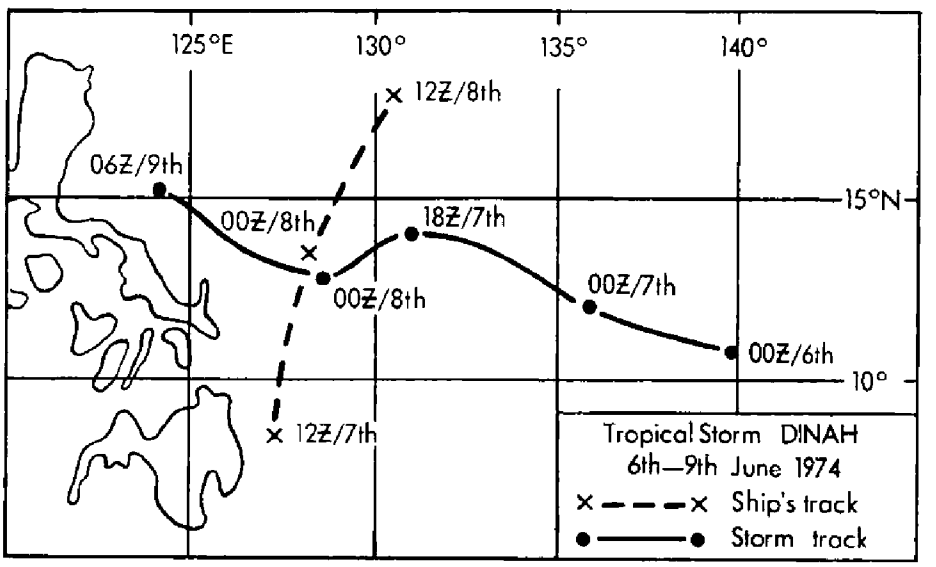
Position of ships whose reports appear in "*The Marine Observers' Log*".

1900: Air temp. 26·3°, sea 28·0°. Pressure 1003·9 mb. Wind WNW, force 3. Heavily overcast with continuous light rain and occasional heavy rain squalls. Visibility mainly good. Vessel rolling in slight beam sea and moderate W'ly swell. By 1905 wind had increased to force 8–9 during a violent rain squall and the barograph trace fell vertically.
2100: Air temp. 26·6°. Pressure 1000·7 mb. Wind NW'W, force 7.
2230: Vessel rolling and pitching in rough sea and moderate to heavy swell.
2300: Air temp. 25·0°. Pressure 995·3 mb. Wind variable, force 2. Heavily overcast with violent rain squalls. Visibility moderate to good.

8th
0001: Air temp. 28·3°. Pressure 993·9 mb. Wind NE'N, force 8–9. Vessel spraying over all. By 0027, vessel on reduced speed due to stress of weather.
0100: Pressure 994·4 mb. Wind NE'E, force 7. Weather improving by 0114. Revolutions slowly increasing to normal sea speed.
0300: Air temp. 28·0°. Pressure 999·6 mb. Wind SE'ly, force 6. Vessel pitching and rolling in rough sea and heavy swell.
0600: Air temp. 28·2°. Pressure 1000·5 mb. Wind ESE, force 5.
0700: Wind ESE, force 5, decreasing to force 4. Heavily overcast with rain in the vicinity. Vessel pitching and spraying easily in rough to moderate sea with short, confused swell. Weather moderating throughout.
1100: Pressure 1004·0 mb. Wind ESE, force 6. Heavily overcast with occasional showers. Vessel pitching and rolling in moderate to heavy sea and swell.
1200: Six-hourly observations resumed.

Position of ship at 2230 on 7th: 12° 50'N, 128° 08'E.
Position of ship at 0300 on 8th: 14° 21'N, 128° 49'E.

Note. The tracks of the *Benalder* and Tropical Storm Dinah are shown on the chart. Dinah suddenly intensified to tropical storm strength on the night of 7th/8th June, temporarily



heading WSW as the storm deepened. Later on the 8th Dinah became a typhoon and resumed its WNW'ly track. It crossed Luzon on the 9th and caused more than 70 deaths and $1,000,000 damage.

TWO DEPRESSIONS

North Pacific Ocean

m.v. *Tacoma City*. Captain J. Cann. Wakayama, Japan to Victoria, B.C. Observers, the Master and ship's company.

24th–26th April 1974. When the vessel was eastward bound in a ballasted condition south of the Aleutian Islands she encountered heavy weather associated with two depressions. The following observations are in SMT and the vessel crossed the Date Line during the period. The ship times and related wind details have been added to the barograph trace.

24th

0001: (GMT + 12). Ship's course 071°T. Slight sea. Very heavy N'ly swell. Vessel rolling and pitching heavily. Overcast and clear. Pressure falling rapidly.

0800: Moderate to rough following sea. Heavy N'ly swell which became confused by 1000.

1200: Course now 090°T. Heavy S'ly swell. Overcast with occasional rain.

1600: Rough sea. Heavy S'ly swell. Vessel rolling heavily at times, shipping water over all. Continuous light rain.

1700: Altered course to 144°T to avoid close proximity of depression.

2000: Very rough sea and very heavy swell. Rolling and pitching heavily. Speed reduced at 2015 due to heavy weather. Wind had increased to SE'S, force 8. Overcast with continuous rain.

2130: Altered course to 060°T.

2359: Sea conditions unchanged. Overcast with light rain. Wind SE'S, force 5, later easing to force 4.

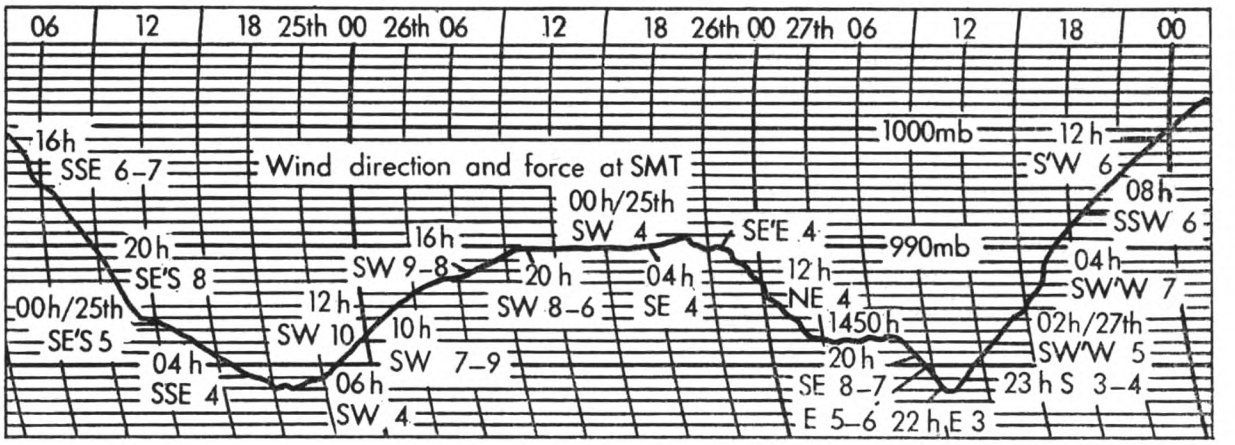
24th

0100: Clocks retarded 23 hours (GMT − 11). Increased to full speed. At 0115 altered course to 090°T.

0400: Slight to moderate sea. Very heavy high swell. Rolling and pitching heavily at times. Overcast with occasional light drizzle.

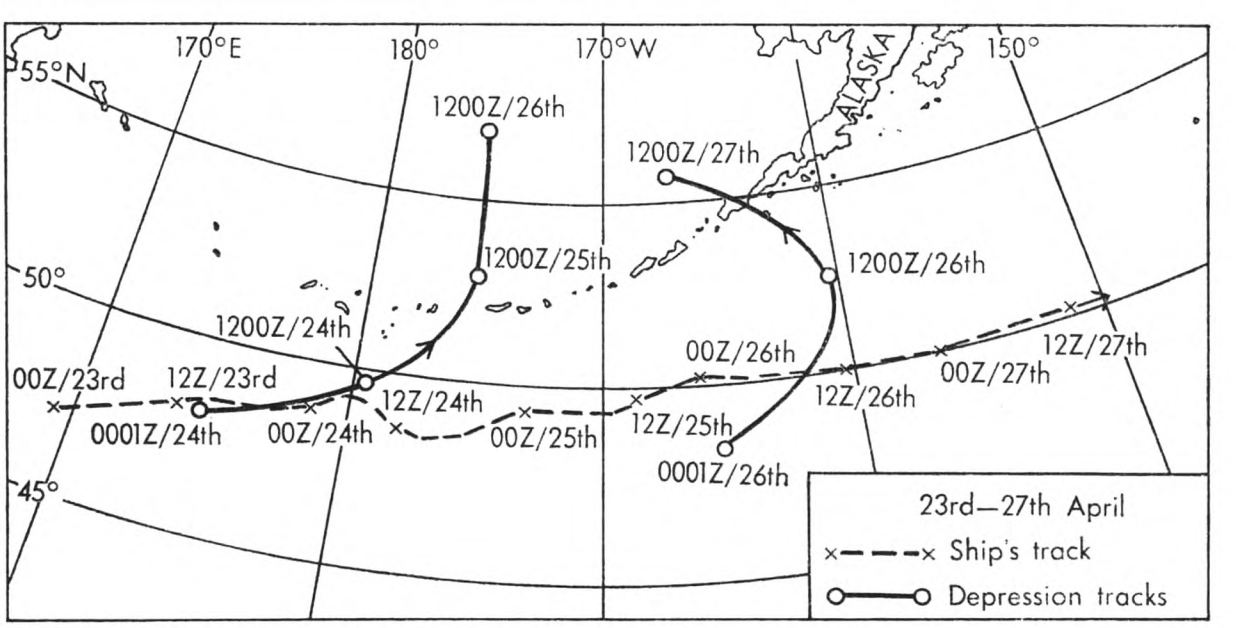
0600: Wind veered to SW, force 4, increasing to force 6 by 0700.

0800: Rough following sea. Steep heavy swell. Rolling heavily and pitching violently at times. Shipping water over all. Overcast with frequent rain.



1100: Wind increased to SW, force 9–10.
1200: Wind now force 10. Very rough following sea. Very steep heavy swell. Overcast with light rain.
1600: Sea conditions unchanged. Rolling and pitching heavily. Cloudy with occasional light rain. Wind SW, force 9, decreasing to force 8.
0001: Wind SW, force 6, decreasing to force 4. Cloudy and clear. Sea conditions unchanged.
0400: Wind SE, force 4. Slight to moderate sea. Still rolling and pitching heavily. cloudy with occasional rain.
1210: Wind backed suddenly to NE, force 4.
1345: Wind veered suddenly to ESE, force 3 and rapidly increased.
1520: Reduced speed due to heavy weather. Wind ESE, force 8.
2000: Very rough sea and very confused swell. Rolling and pitching heavily. Shipping water over all. Continuous light rain. Wind SE, force 8, backing to E'ly at 2100 and decreasing.
2300: Wind veered to s'ly, force 3.

25th
0145: (GMT – 10). Wind veered to SW'W, force 5.
0400: Rough sea. Heavy swell. Vessel rolling and pitching heavily at times. Shipping occasional water. Overcast with intermittent light rain. Wind increased to force 7.
0500: Engines increased to full speed.



0800: Wind SSW, force 6. Sea conditions gradually moderated during the day and the weather conditions improved.

Position of ship at 2100 SMT on 23rd: 46° 47′N, 168° 17′E.

Position of ship at 0001 on 27th: 26° 50′N, 155° 00′W.

Note. The *Tacoma City* was unfortunate enough to be affected by two depressions which passed close to the ship in the space of about 48 hours (see chart). The first depression formed during the forenoon of the 23rd and deepened rapidly as it moved ENE, passing close to the ship during the following night. This storm turned north on the evening of the 25th and decayed later on the following day. As it decayed, another depression (which probably developed from a wave on the cold front associated with the first depression) formed on the 26th and passed very close to the ship early that afternoon before recurving towards the NW during the evening. As both depressions were deepening as they passed close to the ship the minimum pressures recorded on board occurred several hours after both centres passed their closest point of approach.

UNUSUAL CLOUD FORMATION

Australian waters

m.v. *Phemius*. Captain D. M. Belk. Brisbane to Sydney. Observer, Mr. J. Othman, 3rd Officer.

14th April 1974. At 1045 LMT (0045 GMT), in position 10 miles off Cape Byron, a distinct white streak resembling a bent waterspout was seen, two points off the port bow, amongst a darkened patch of Cb cloud. On closer inspection through binoculars, the streak appeared to start from the top of the cloud, curving towards the horizon and ending just above it. The phenomenon lasted for about 7 min and

disappeared when the clouds enclosed it. The cloud base was approx. 900–1200 m with a horizontal visibility of 12–14 miles. I have tried to find out what caused the above-mentioned phenomenon and perhaps discover the name by referring to some books on meteorology, but have been unsuccessful. I hope you will be able to explain this phenomenon from the basis of my description. Air temp. 21·8°C, wet bulb 19·7°. Pressure 1014·3 mb. Wind SSW, force 4.

Position of ship: 28° 43′S, 153°47′E.

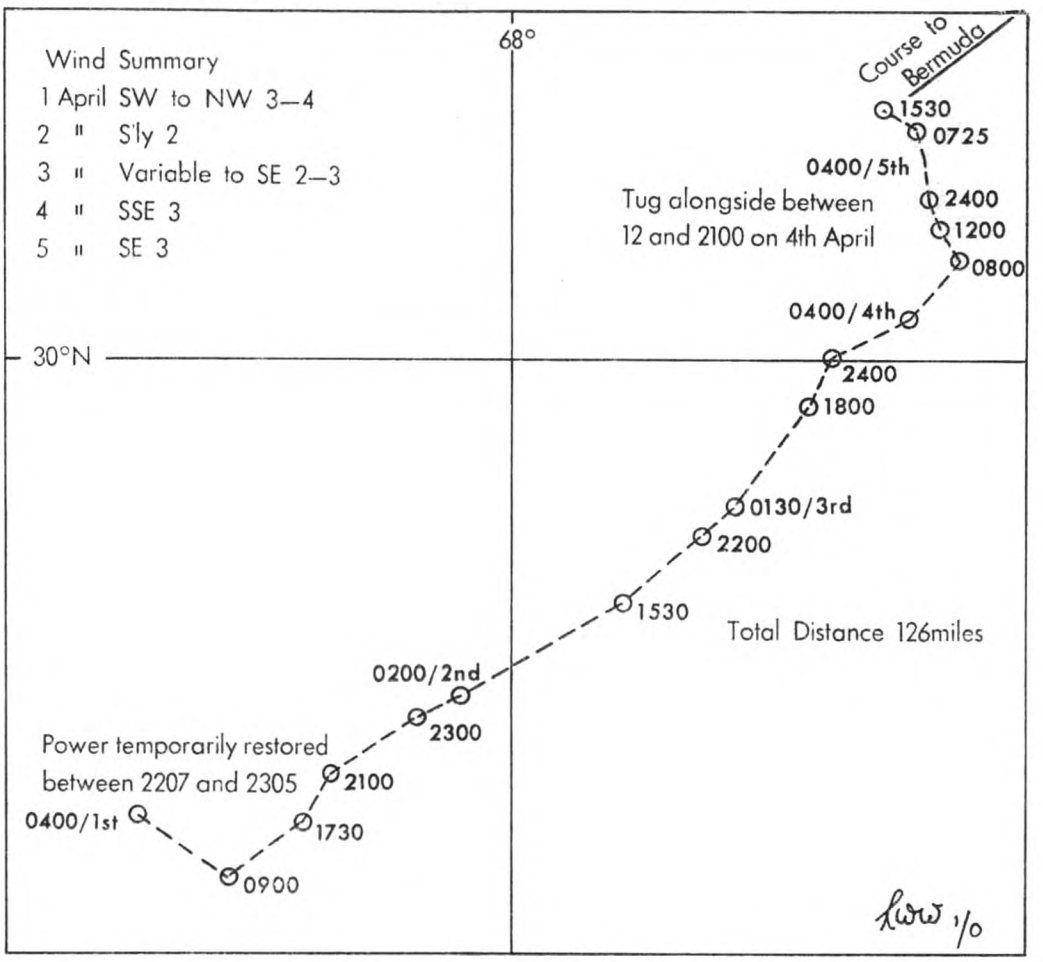
Note. A possible explanation is that the white streak was a swath of heavy precipitation which evaporated in the dry air below the cloud base. The distortion of the streak would probably be due to a vertical wind shear—strong winds overlying weaker winds.

CURRENT SETS

Western North Atlantic

R.M.S. *Queen Elizabeth 2*. Captain P. Jackson. Cruising. Observers, the Master, Mr. R. W. Warwick, 1st Officer and Mr. N. Bamford, 2nd Officer.

1st-5th April 1974. While the vessel was stopped for 4½ days south-west of Bermuda it was possible to observe the ocean currents. The drift experienced is plotted on the chart. The draft of the ship was 9·1 m and the height of the bridge above the



water-line is over 27 m. The positions on the plot were established by Omega navigation equipment.

Position of ship at 0400 GMT on 1st: 29° 14′N, 68° 44′W.

Position of ship at 1530 on 5th: 30° 15′N, 67° 17′W

Note. The predominant current in this region at this time sets NNE at a rate of about ½ kt; the mean rate of the vessel's drift over the four-day period was about 1 kt. Some of this drift is probably directly due to the wind blowing on to the vessel. In general, the direction of the drift is to the right of the wind direction: this is in keeping with the effect of the earth's rotation. Since the direction of drift seems to have responded well to wind direction changes, especially on the 4th and 5th, perhaps the major part of the vessel's movement was, in fact, leeway.

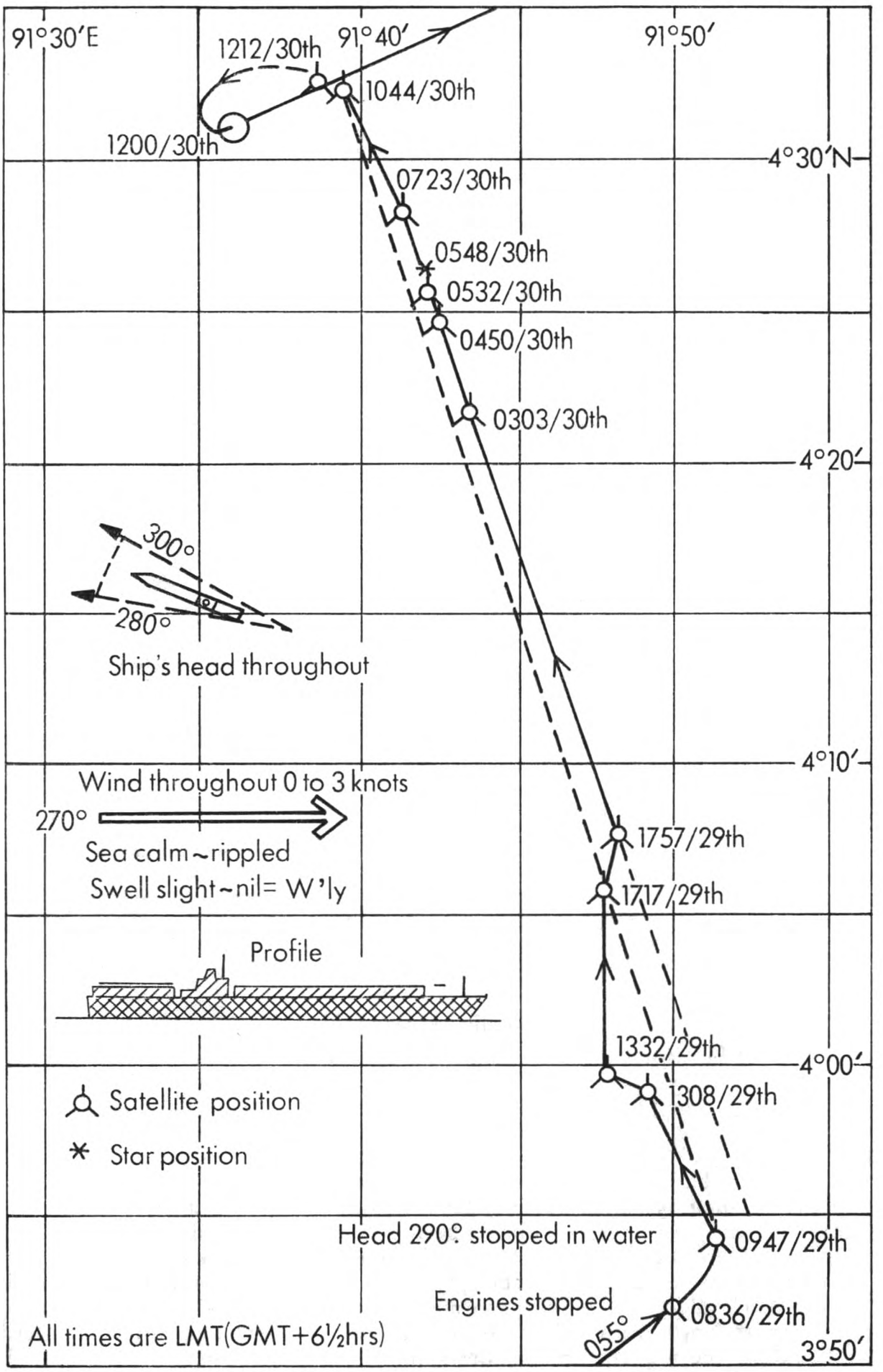
Indian Ocean

s.s. *Liverpool Bay*. Captain C. S. MacKinnon. Table Bay to Singapore. Observer, the Master.

29th–30th June 1974. The vessel experienced an unexpected drift and set to NNW whilst stopped for 27 hours about 250 miles westward of northern Sumatra. During that period the change of position amounted to a course of 345° by 42·4 miles at a rate of 1·56 kt. However, when the engines stopped at 0836 SMT (1206 GMT), the ship was heading 055° at 26 kt in calm conditions and, with a displacement of 63,213 tons, the head reach should have been in the order of 6 miles. Unfortunately the power failure affected the SAL log so this could not be verified.

A position by satellite navigator at 0947 (see chart overleaf) appeared to be a good fix. It gives a head reach of 4 miles or so, allowing for the ship having turned through 125°, through North, with rudder amidships. The ship then stopped in the water.

At 1136 on the 30th the position was good, worked back from noon sights and satellite positions. The change of position between 0947 on the 29th and 1136 next day was 342° by 40·7 miles, equalling 1·58 kt.



Drift experienced by the *Liverpool Bay* (see previous page).

The positions between 0947 and 1757 on the 29th appear to be erratic, as plotted, but these positions also seemed to be quite reasonable according to the satellite print-out. Unfortunately, due to power disturbance, the satellite navigator was definitely unreliable between 1757 on the 29th and 0303 next day.

The extract from the routeing charts for June and July make it clear that the set and drift experienced by the vessel was completely contrary to expectation. With the enormous expanse of flat side, these [container] ships do unquestionably 'sail' at times but, tacking so close to the wind, I question whether the *Cutty Sark* could have equalled this performance in the prevailing light wind.

Position of ship at 0836 on 29th: 03° 52′N, 91° 50′E.

Note. The chief characteristic of the currents in this area is their variability. The constancy of the predominantly SE'ly set shown on current charts is low—less than 50 per cent. Current roses for this region show that the current may set in any direction and that its mean rate is less than 1 kt, though occasionally this may be exceeded.

RADAR ECHO FROM FISH

Eastern North Pacific

m.v. *Westmorland.* Captain J. D. Guyler. Balboa to Auckland. Observers, Mr. L. J. Hesketh, 2nd Officer and Mr. M. C. Hill, 2nd Radio Officer.

17th May 1974. At 0900 GMT, whilst the radar was in operation for navigational purposes, an echo was observed ahead at a range of 8 miles. The size of this echo was about 6 miles by 2 miles and appeared similar in character to a normal echo of rain reaching the surface. However it was a clear night and no clouds or rain were visible ahead. When the vessel entered this area, which was only after navigating with extreme caution, the air became fouled by a strong smell of fish and, when a light was shone over the ship's side, it was reflected back from the eyes of numerous fish. The type of fish was unidentifiable owing to darkness, but their number was sufficient to affect the ship's steering.

Position of ship: 00° 22′N, 91° 43′W.

Note. Mr. A. C. Wheeler, Department of Zoology, Natural History Museum, comments:

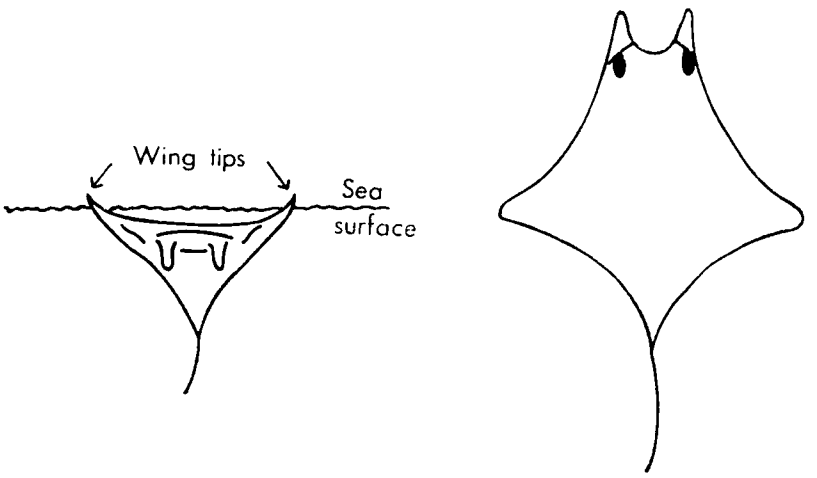
"It is impossible to give any identification of the fish concerned without actual details of specimens. As it was night-time it may be that the fish observed were deep-water species, many of which are known to make vertical migrations daily and to be close to the surface at night. Such fishes as lantern-fish and hatchet-fish can often be taken at the surface. If so I have never heard of them being present in such numbers as to affect the steering. It may be, however, that they were so dense in the relatively small area as a result of the accumulation of food organisms by currents and that other predatory marine animals were also present. I can offer no explanation of the radar echo from the area."

FISH

Eastern North Atlantic

s.s. *Benvrackie.* Captain J. D. Pryde. Dakar to Cape Town. Observers, Mr. R. I. Roberts, 1st Officer, Mr. T. J. Mooney, Cadet and ship's company.

2nd February 1974. Between 1700 and 1915 GMT many hundreds of Rays were observed; even with binoculars, the 'wing' tips of the fish could be seen above the surface on either side of the ship and also ahead for as far as the eye could see. Some were in pairs and others in groups of two or three, all along the vessel's course line, a total of about 40 miles. It seemed that they were all heading on a reciprocal course to ourselves, moving slowly on the surface with an occasional Ray leaping clear of the water to land with a great splash. Good observations were made with the aid of binoculars and the Rays appeared to be about 1·5 m across the wings and from 1·8–2·4 m in length, including the tail. They were black on top and very white beneath, having two 'horns' in front below the mouth, very much like Manta Rays.



Until the ship moved nearer only two 'wing' tips could be seen above the surface looking like the fins of two sharks. Observations ceased at sunset but, as we crossed the 100-fm line at 1908, the number of Rays seemed to be thinning out. Course 143°T at 15·3 kt.

Position of ship at 1800: 09° 54′N, 16° 24′W.

Note. This interesting report was received too late for inclusion in the January edition.

MARINE LIFE

Eastern North Atlantic

m.v. *Sugar Exporter.* Captain C. N. L. Davies. Porto Grande, St. Vincent to London. Observers, the Master, Mr. T. L. J. Evans, 2nd Officer and ship's company.

27th April 1974. From 1400 to 1700 GMT a shoal of *Velella* or 'by-the-wind sailors' was observed passing along the ship's lee side while the vessel was stopped. The shoal consisted of numerous clusters of very small *Velella* which appeared to be under the watchful eye of a few larger members of the community. It was impossible to estimate accurately the extent of the shoal as the colour of the *Velella* is almost that of the sea, and also because they could not be observed while the ship was in motion. However, a rough estimate was 20–30 in a square metre, which took about 15 minutes to complete the length of the ship (170 m). At the time the wind was NE'ly, force 3.

The sizes of the *Velella* ranged from 1 to 4 cm, but there were some as big as 6 cm which we were unable to catch. The specimens were oval in shape with a perfectly shaped semi-transparent sail which was mounted diagonally. Concentric circles extended from the point where the centre of the sail met the float, spreading outwards for 2/3 of the radius to a dark-blue circle. The float was then bordered by a broad light-blue band. Tentacles hung underneath from the edge of the float and there was a group of smaller tentacles surrounding the 'heart' of the animal. This centre was blue/grey and banana-shaped.

On close inspection of the specimens, one was seen to have a small fish trapped in the innermost tentacles. It was not known whether this fish was a parasite or the *Velella*'s next meal.

Position of ship: 30° 39′N, 18° 37′W.

Note. Dr. P. F. S. Cornelius, Head of the Coelenterate Section, Department of Zoology, Natural History Museum, comments:

"*Velella* is of course commonly reported from tropical mid North Atlantic but it is nice to receive specimens. The fish on which they were feeding were identified by Mr. A. C. Wheeler, Fish Section, as immature pipe-fish, *Macromorphosus gracilis.* He commented that it is unusual to find specimens of the fish so small as this on the surface in mid-ocean."

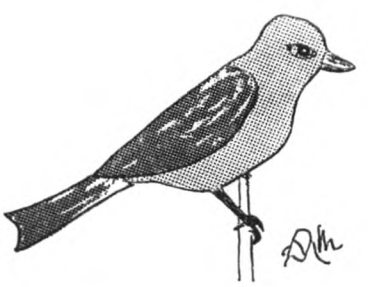
BIRDS

North Atlantic Ocean

s.s. *Northern Star*. Captain W. A. Murison. Barbados to Southampton. Observers, the Master, Mr. D. Stewart-Taylor, Extra 1st Officer and Mr. C. Leggett, Cadet.

3rd May 1974. Between 1330 and 1530 GMT a finch-like bird of unknown species was sighted flying around the vessel. It was about the size of a starling with the following features: the beak was seed-eating in shape and dark yellow; the bird's wings and tail were black or very dark brown with light under-wings; the head and body were scarlet and it had black or dark-brown legs. The bird flew with short bursts of rapid wing beats, followed by a dipping glide. Course of vessel 044°T.

Position of ship at 1200: 20° 08′N, 52° 33′W.



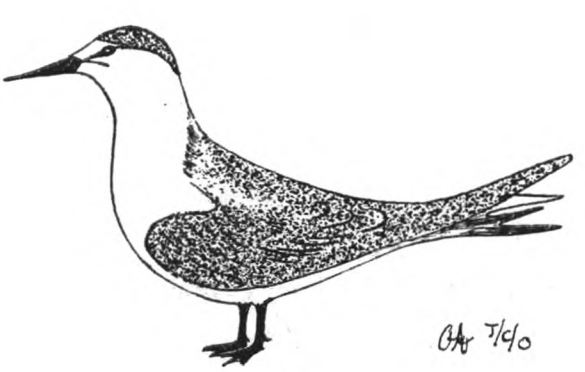
Note. Captain G. S. Tuck, D.S.O., R.N., Chairman of the Royal Naval Birdwatching Society, comments:

"The bird was a male Scarlet Tanager (*Piranga olivacea*). It breeds in North America from Nova Scotia southwards and migrates southwards to South America to winter in Colombia and Bolivia, eastern birds passing through the West Indies. This bird was in full spring/summer plumage and on a northward migration in May. It breeds in woodlands and groves. The females, immatures and even males in winter plumage are dull green above and yellowish below, the plumage of the male contrasting with its brilliant scarlet summer plumage."

Indian Ocean

m.v. *Mahout*. Captain G. F. Kay. Colombo to Durban. Observer, Mr. A. M. P. Henderson, Junior Chief Officer.

18th April 1974. At 2345 GMT two birds were observed circling the ship, emitting sharp, high-pitched cries and exhibiting flashes of white as they flew past the navigation lights. Just before the synoptic hour, one flew into a whip aerial above the bridge and fell stunned on to the bridge wing. It did not seem injured, although it frequently jerked its head forward with its beak open and then shook it vigorously as if trying to clear its throat of an obstruction. It stood still while I got close to sketch it by torchlight. The other bird continued circling overhead, calling out and being answered by the bird on the deck. It flew off as I finished the weather observation, apparently unhurt and able to fly normally. We have no literature on birds



aboard and would be glad if it could be identified. The vessel was at this time 40 miles ESE of the Farquhar Islands. Wind ENE, force 5.

Position of ship: 10° 30′S, 51° 38′E.

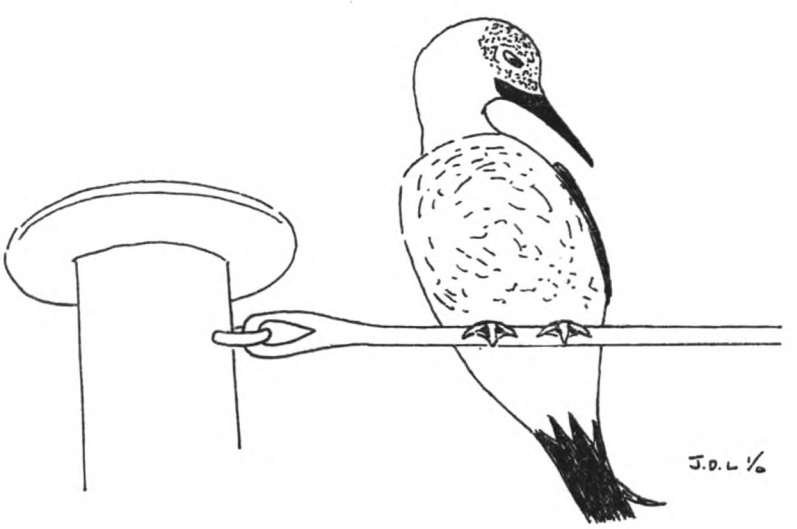
Note. Captain G. S. Tuck comments:

"The birds were Sooty Terns (*Sterna fuscata*). This is the most prolific of the tropical terns, breeding in immense colonies principally on islands in all the three main tropical oceans of the world. It is also highly oceanic and is often seen far from land in large flocks, hovering and fishing on shoaling fish. The Sooty Tern tends to follow in the wake of ships at night, feeding on small squid churned to the surface while uttering high, screaming calls. Attracted by ships' lights, it sometimes hits the rigging and is found stunned on deck."

Indian Ocean

m.v. *Bendearg*. Captain R. E. Cowie. Durban to Penang. Observers, Mr. J. D. Lewthwaite, Chief Officer and Mr. C. C. McPherson, Cadet.

26th April 1974. At 0030 GMT a bird was seen resting on the triatic stay near the mainmast truck. It seemed quite happy there preening its feathers and stayed for about an hour. The bird's forehead was brown, becoming paler towards the crown



and the rest of its head was off-white, as was its neck. Its body was mainly dark brown on the back and light brown on the underside, becoming off-white towards the tail. It had a dark-brown beak and red webbed feet. When the bird flew away we noticed that its wing span was approximately twice the length of its body. The mainmast truck is shown in the sketch to indicate the bird's relative size and is 30 cm in diameter.

Position of ship: 6° 04′S, 77° 50′E.

Note. Captain G. S. Tuck comments: "This was a Red-footed Booby (*Sula sula*), the red legs identifying the species. They occur in both a pale phase with white wings and body, and a dark phase with brownish wings and body."

Eastern South Pacific

m.v. *Megantic*. Captain W. M. Wheatley. Balboa to Wellington. Observers, Mr. R. Wooding, Chief Officer, Mr. A. V. Macan and Mr. M. Green, Cadets.

23rd–24th April 1974. At approx. 0615 LMT (0015 GMT) on the 23rd the cadet on watch discovered that we had gained a passenger, namely a small bird which was flapping around the engineers' deck. The bird appeared to be quite unafraid and was easily picked up and placed in a cardboard box. It was then noticed that a small amount of oil or grease covered part of its chest; this was easily removed by using a small amount of grease solvent.

The next task was to try and feed the bird and the first method attempted was with

a syringe, minus the needle and filled with sugared water, but this method brought no success. Meanwhile the Chief Officer was attempting to identify the bird by referring to back editions of *The Marine Observer*. A picture of a Storm Petrel was located in one edition and by comparing the sketch with the real thing it was decided that the bird was indeed a Storm Petrel. It appeared to be in a state of some exhaustion so we left it in the box to rest.

It was assumed that the bird originated from the Galapagos Islands since we had passed 40 miles to the south of them about 36 hours previously.

The bird slept on and off during the remainder of the day and refused to eat anything that was offered but, when placed in the sink with some water in it, it took two or three sips.

By keeping the bird overnight in the cadets' cabin it was able to rest in the warmth and regain its strength so that, by the morning of the 24th, despite having had nothing to eat, it appeared to have fully recovered. In the afternoon we decided to set the bird free but, when placed on the deck, it appeared to be top-heavy and kept falling forward. As there seemed no chance of it taking off without assistance it was thrown gently into the wind and was last seen flying low over the crests of the waves.

Position of ship at 0015 GMT on 23rd: 5° 42′S, 95° 12′W.

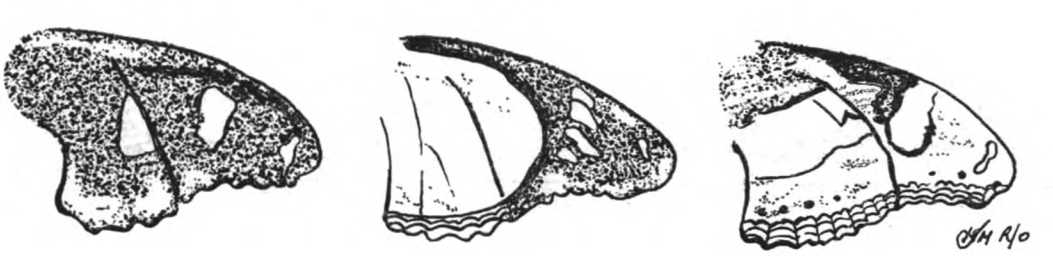
INSECTS

South Atlantic Ocean

m.v. *Jumna*. Captain G. A. Hankin. Port Louis, Mauritius to U.K. Observers, Mr. H. T. Kyi, 3rd Officer and Mr. J. H. Hutchinson, Radio Officer.

2nd April 1974. At 0400 GMT, while the vessel was about 360 miles ENE of St. Helena, an extremely large number of butterflies descended on the ship and a few of them were caught for examination. There were two types, presumably the male and female of the species. One had wings which were orange and black with white patches; the other had black or very dark blue wings, with white patches on the top side. The undersides of both were similar, being mainly orange or brown with white patches (see sketches). Wing span was approx. 8 cm. By 0900 nearly all the butterflies had disappeared, the majority going when the ship entered a rain shower. Course of ship 323°T at 14·3 kt. Air temp. 25·5°C, wet bulb 24·1°. Wind SE'ly, force 3.

Position of ship at 0400: 12° 48′S, 00° 30′W.



Note. Mr. R. I. Vane-Wright of the Department of Entomology, Natural History Museum, comments:

"The description clearly refers to the well-known migratory butterfly, *Hypolimnas misippus* (L.). This extremely interesting species, the tan-coloured females of which are mimics of *Danaus chrysippus*, is known from the Old World tropics, and has also penetrated central and southern America, perhaps quite recently by its own 'unaided' efforts."

Eastern North Pacific

s.s. *Cardigan Bay*. Captain D. H. Stewart, R.D. Balboa to Tokyo. Observer, Mr. S. Brown, 2nd Officer.

14th–15th April 1974. Having made the canal transit on the 14th and then steamed south around the Azuero Peninsula, a beetle was found on the morning of the 15th, striding boldly along the bridge-wing dodger.

During the night of the 14th we experienced, at times, strong off-shore winds, force 4–5; as our courses were only 10 miles off the coast, it is more than likely that our beetle was thus transported from the shore. Failing that, during our actual canal transit seemed the ideal time for it to have stowed away.

Although a full tin of a well-known brand of aerosol insect-killer was used in a confined space, this had no effect and a more sure method had to be adopted. Thus a cup of water was used for the final kill.

Position of ship: 08° 50′N, 84° 55′W.

Note. Mr. C. H. C. Lyal of the Department of Entomology, Natural History Museum, comments:

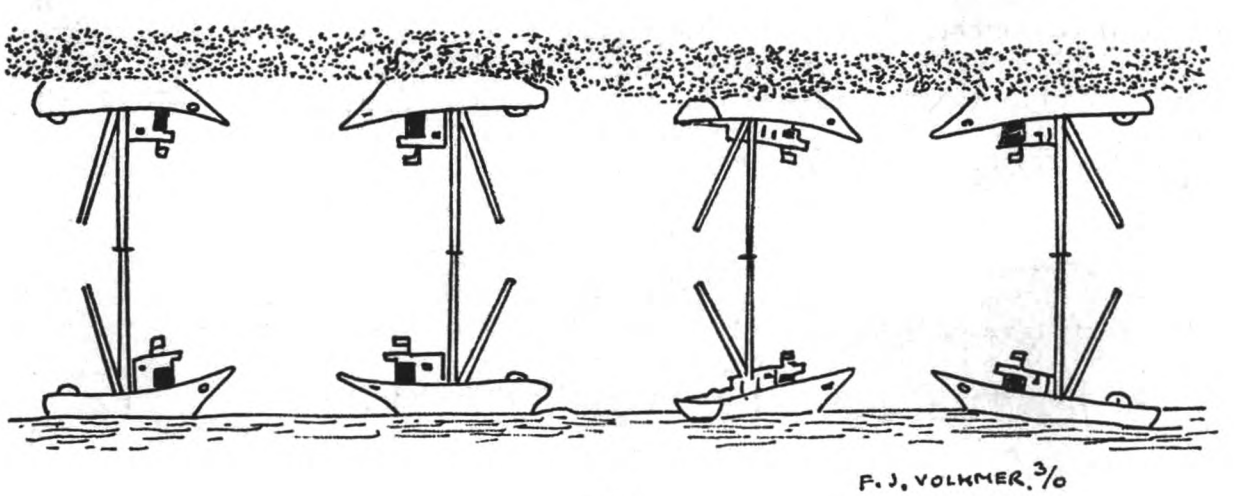
"The beetle collected aboard the *Cardigan Bay* is a Hemipterous insect of the family Pentatomidae, the species being *Vulsirea violaceus* (Fabricius). Our thanks for this insect which is not very well represented in our collection."

ABNORMAL REFRACTION

Nova Scotian waters

s.s. *Gypsum Empress*. Captain E. S. Creaser. Little Narrows, N.S. to Stony Point, N.Y. Observers, Mr. P. K. Mukherjee, Chief Officer and Mr. F. J. Volkmer, 3rd Officer.

21st May 1974. At about 1100 GMT (0700 SMT) an unusual phenomenon of abnormal refraction was observed approx. SSE of the ship. Four fishing vessels were seen, their reflections inverted immediately above their true positions, against the horizon. This was apparently a case of total internal reflection within a narrow medium of extremely variable atmospheric densities. A thin straight line of grey cloud marked the reflective surface or layer. This appeared to be the upper edge of the medium. The phenomenon was visible for about 10 min. Width of medium



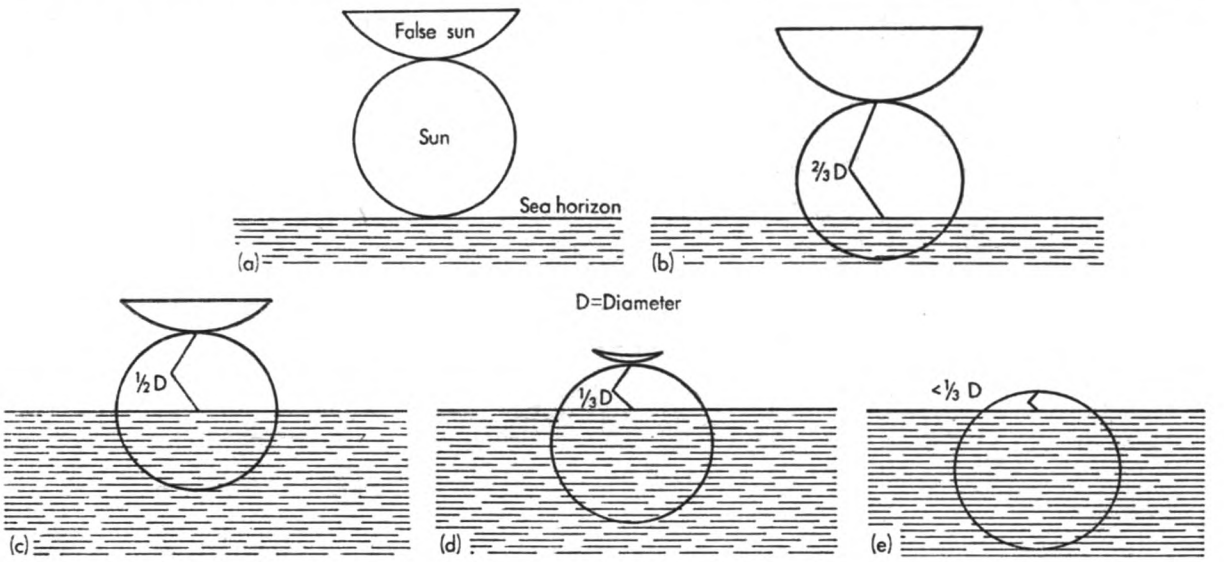
approx. 3°. Air temp. 7·0°C. Pressure 1022·0 mb. No wind, calm sea. Sky cloudless.
Position of ship: 43° 20′N 65° 15′W.

Note. The *Gypsum Empress* is a Canadian Auxiliary Ship.

Persian Gulf

t.t. *Herminios.* Captain E. Castro. Kharg Island to Lisbon. Observer, Mr. P. N. Mendes, Chief Officer.

15th May 1974. As the sun set some unusual features were observed, as shown in the sketches. When the sun's lower limb was close to the horizon a false sun began



to appear (a). As the sunset continued the false sun increased in size and reached its greatest dimension when about a third of the sun's diameter was below the horizon (b). The false sun began to decrease in size as the sun sank further below the horizon. The sun's outline had not been very clear, as if viewed through layers of mist. The sky was clear but hazy, a typical sky in the Persian Gulf at this time of year, and a few small clouds only became visible at sunset. Air temp. 29·0°C, wet bulb 24·5°, sea 27·0°. Wind WNW, force 4.

Position of ship at 1509 GMT: 26° 37′N, 52° 59′E.

Note. The *Herminios* is a Portuguese Selected Ship.

LUNAR MIST BOW

North Pacific Ocean

m.v. *Star Acadia.* Captain R. G. Dickson. Eureka, Calif. to Goldriver. Observer, Mr. E. G. Stout, 2nd Officer.

2nd June 1974. At 0730 GMT (0030 SMT), as the vessel was proceeding northwards off Cap Blanco, a distinct lunar mist bow was observed for a period of approx. 20 min during a light drizzle and in a mist patch.

Appearing at first as a dull-greyish colour, it intensified into a whitish glow with faint red and blue external and internal arcs. This rather brilliant phenomenon lasted for a period of 12 min before the bow again returned to its former colour and them diminished completely as the mist began to clear. The moon, which was waxing about ¾ full (gibbous), was bearing 203°T at an altitude of 26°. The ends of the bow bore 350° and 055°, about half way between the vessel and the horizon. The altitude of the arc was 15° above the horizon. Mist and drizzle patches had been predominant during the preceding hour and persisted for about an hour after the observation, but no further bows were observed. Wind N′W, force 4. No cloud. Course 350°T.

Position of ship: 42° 43′N, 124° 45′W.

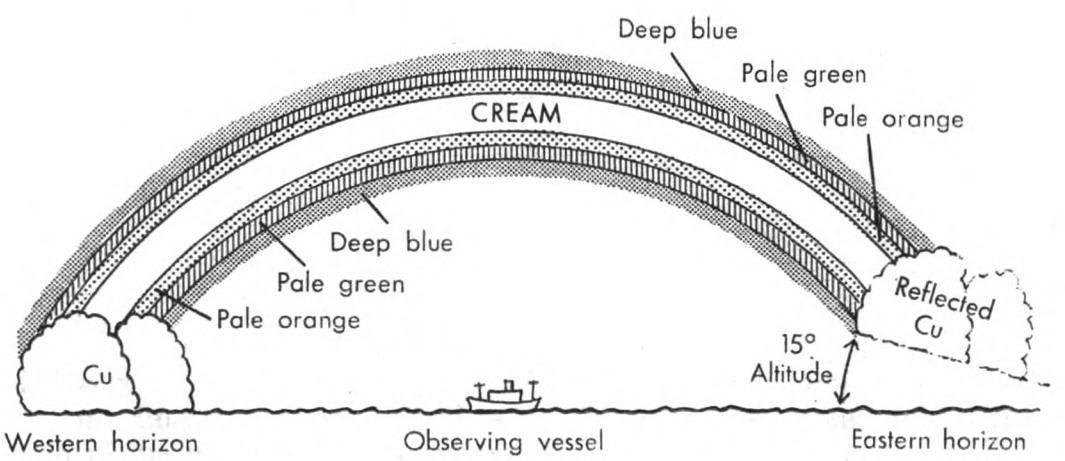
CREPUSCULAR RAYS

Western North Pacific

m.v. *Manchester Concept*. Captain J. Baker. Los Angeles to Keelung. Observers, the Master and most of ship's company.

17th April 1974. At about 1930 SMT (0930 GMT), shortly after sunset, the sky was observed to be divided into two distinct halves by what appeared to be crepuscular rays. These rays spread from the western horizon across to the eastern horizon in a band approx. 5° wide. The sky was deep blue and the rays were arranged in the order of pale green, pale orange, cream, pale orange and pale green. At the time of sunset there were, on the western horizon, medium and towering Cu clouds, the eastern horizon being clear. By following these rays across to the east a well-defined reflection of the Cu cloud on the western horizon could be seen at an altitude of approx. 15° above the eastern horizon where the rays converged. Air temp. 23·2°C, wet bulb 22·8°. Pressure 1015·9 mb, rising steadily. Wind light and variable with a calm sea. Excellent visibility.

Position of ship: 26° 33′N, 146° 34′E.



Note. Although crepuscular rays are commonly observed they are rarely seen so vividly. Due to perspective, they appear to diverge from the direction of the sun and then converge towards a point above the opposite horizon, known as the anti-solar point. The appearance at this point of an image of the clouds which are producing the crepuscular rays cannot be readily explained.

TOTAL SOLAR ECLIPSE

Indian Ocean

s.s. *Jervis Bay*. Captain M. J. Heron. Cape Town to Melbourne. Observers, the Master and ship's company.

20th June 1974. Shortly after lunchtime the whole ship's company gathered on and around the port bridge wing armed with sextants, smoked glass, welding masks and any other suitable optical accessories available to view the extensively advertised total eclipse of the sun.

At 0430 GMT the moon made its first contact with the sun and for the next hour the crowd waited in breathless anticipation for the total eclipse to occur, but with many a fearful glance towards the ominous clouds which were threatening to ruin the long-awaited spectacle. Fortunately, due to some split-second manœuvring by the 2nd Officer Navigating to avoid a rain shower, we saw the total eclipse which commenced at 0534. During this period a breathtaking 'diamond-ring' effect was observed, but unfortunately Baily's Beads failed to materialize and there was some disagreement as to whether anybody had actually seen the solar prominences.

After the period of totality, which lasted from 0534 to 0538, the audience slowly drifted away and the last contact between the sun and the moon was at 0647.

Mention should be made of the rival 'side-show' which took place on the starboard bow. A spectacular rainbow was observed there for the entire duration of the eclipse except for the period of totality, during which time it could not compete with the greater attraction and hid its face in shame. Air temp. 10·5°C, wet bulb 8·4°. Pressure 1028·4 mb. Wind SW'ly, force 3. Cloud 4/8 C_L2. Course 086°T at 21 kt.

Position of ship at 0534: 39° 54'S, 127° 27'E.

ROCKET LAUNCH

off California

m.v. *Prince Rupert City*. Captain J. S. Murray. Vancouver to Panama. Observer, Mr. K. J. Cribbin, 3rd Officer.

26th April 1974. At 0724 GMT I observed the launch of a space craft of some description on a bearing of 050°T from the vessel's position. The coastline, over 21 miles away, was illuminated clearly by the flare from the rocket, and several vessels in the vicinity were clearly visible in the glare. The rocket rose vertically to an altitude of approx. 5° and then, while still rising, began to head in a direction of about 260°T. After approx. 12 sec, at an altitude of approx. 45°, the first stage of the craft was observed to detach itself from the main body and begin to fall behind and below it erratically. The latter was still flaming, but I saw on or near it what appeared to be a regular, quick-flashing light. Both sections soon disappeared behind low cloud.

Position of ship: 34° 34'N, 121° 05'W.

Note. Unfortunately we have no details of the space vehicle but it was launched from the Western Test Range, California (34° 38'N, 120° 32'W).

SEARCH AND RESCUE

Eastern North Pacific

m.v. *Columbia Star*. Captain R. Brownbill. Los Angeles to Balboa. Observers, the Master and ship's company.

28th May 1974. At 0400 GMT the vessel received an urgent message from the *Fresno City*, call sign GOND, that she had lost a man overboard. At 0808 the vessel arrived in the search area and commenced a search up and down the course line of the *Fresno City*. One of our cadets, Mr. J. Willis-Richards, sighted a man waving in the water at 1127 and, at 1150, 18-year-old Cadet John Concannon of the *Fresno City* was recovered from the water by our port lifeboat.

The survivor was brought back to the ship where his first request was for a drink of water. He drank about three pints after which he had a bath, a rub-down and a change of clothes. Apart from his obvious exhaustion, he seemed very fit and one hour later was returned to his own vessel, again by lifeboat. The *Fresno City* is owned by Sir William Reardon Smith & Co. of Cardiff.

This lad undoubtedly owes his life to a great deal of luck and the very calm weather prevailing at the time. Throughout this period the winds were variable, about force 1 and hence no sea, although there was a confused swell of about 2½ m. The sea temperature was 28·0°C.

The survivor reported that at no time was he troubled by the cold. He did have some difficulty with his breathing and found that with short, shallow breaths he swallowed less water. He saw one shark but it went away as he was thrashing about trying to attract the attention of a passing ship. In all, he spent about 10 hours in the water.

Position of ship at 1150: 08° 37'N, 84° 45'W.

AURORA

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

"We summarize briefly in the accompanying list the auroral reports received from British ships at the Balfour Stewart Auroral Laboratory of the University of Edinburgh for the months April, May and June 1974. Most sightings occurred during the late equinoctial period. This is because of the obvious factor of lack of darkness during May and June and not due to lack of essential ingredients; sunspot and geomagnetic activity varied little during the three months.

"During April the geomagnetic field was unsettled-to-active for most of the month. There was a dramatic increase of solar activity in the week 9th–15th April, but a recurrent disturbance evident in the geomagnetic field, which started on 18th April and continued at a moderately high level to the 29th, was more productive from an auroral observer's viewpoint.

"On 2nd and 3rd April the *Silvershore* and the *St. Loman* were positioned in an area where aurora in some form might be seen on any clear night, but the flashing and colourful display of 2nd April seen from the *Silvershore* and the beautiful coloured 'curtain' reported from the *St. Loman* were bonuses and visible indications of the increase in the level of geomagnetism at that period.

"Associated with the activity of 18th April, rays to the zenith were reported from the *Weather Reporter* at Station 'India' and were seen from the *Weather Adviser* at 'Juliett' as a rayed glow to a height of 8°. The display with flaming rays seen from the *Sugar Carrier* at a relatively low latitude off Nova Scotia in the morning of 21st April was associated with the same level of geomagnetism.

"A sketch and report from observers in the *Weather Reporter* record the maximum of a display around midnight on 26th/27th April. The display developed typically as a glow which spread southwards until visible as an arc, became active with the outburst of rays, pulsating 'curtains', red and green flashes and appearances of other forms, and finally faded away polewards.

"There were quiet geomagnetic conditions at the beginning of May, which rose to a minor storm on 5th May. The short-lived glow seen from the *Weather Monitor* on 8th May was associated with only moderate activity. Active to minor storm conditions prevailed from 14th to 18th May. The report of an associated display seen from the *Manchester Quest* on 16th May allowed estimation of the most southerly arc to be overhead at the latitude of Belle Isle Strait.

"There were no reports of aurora from ships during June though there were several periods of unsettled conditions in the geomagnetic field and a 27-day recurrence, 25th–28th June. During the month solar activity passed from low to moderate and to high after 28th June, building up to the outburst which was to occur early in July.

"We were pleased to receive two reports of noctilucent clouds, which readers will know are also a subject of study and on which we collect data.

Date (1973–4)	Ship	Geographic Position		Λ	Φ	I	Time (GMT)	Forms
14th Nov.	*Summity*	62°42′N	19°54′E	110	61	+74	1745–1900	RR, N
2nd Apr.	*Silvershore*	70°40′N	20°20′E	120	68	+78	2015–2028	HA, HB, P
							2100–2200	HA, HB, RA, RB, RR
	St. Loman	69°45′N	16°00′E	110	68	+78	2345	HA
3rd	*Silvershore*	70°11′N	18°00′E	120	68	+78	0001–0150	HA, RA, RB
	St. Loman	71°30′N	25°30′E	120	67	+78	2100	RB
9th	*Weather Reporter*	59°02′N	19°10′W	070	65	+72	2200–2315	N
18th	*Weather Reporter*	59°05′N	19°00′W	070	65	+72	0230–0500	RB, RR
	Weather Adviser	52°25′N	20°07′W	060	59	+69	0320–0500	RB, RR, P
	Weather Reporter	59°05′N	18°49′W	070	65	+72	2345	N
19th	*Weather Reporter*	59°05′N	18°49′W	070	65	+72	0030–0215	HA
21st	*Weather Adviser*	52°23′N	20°06′W	060	59	+69	0100–0400	N
	Sugar Carrier	44°51′N	60°40′W	010	56	+73	0430–0730	RR, N
	Weather Reporter	59°00′N	18°58′W	070	65	+72	2335–0310	HB, N
22nd	*Sugar Carrier*	49°00′N	64°30′W	010	60	+75	0500	N
25th	*Weather Reporter*	59°11′N	19°00′W	070	65	+72	0001–0120	HB, RA, RB, N
26th	*Weather Reporter*	59°06′N	18°33′W	070	65	+72	2340	HB, N
27th	*Weather Reporter*	59°06′N	18°33′W	070	65	+72	0001–0205	HA, HB, RA, RB, RR
8th May	*Weather Monitor*	52°22′N	19°47′W	060	59	+69	2250–2310	N
16th	*Manchester Quest*	46°53′N	57°28′W	010	58	+74	0250–0325	HA, RA, N

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); P = Patch N = unidentified auroral form.

"On 8th June, at 0100, observers in the *Weather Adviser, en route* from Londonderry, reported seeing wisps of the cloud to the NNE. We received a report from Dyce airport for the same time and giving the same azimuth.

"On 13th June, at 0500, observers in the *Weather Monitor* saw a bright patch of the clouds between NNE and NE, tropospheric clouds clearly outlined against them. The clouds were the usual pearly-white at the southern extension, fading to sepia near the horizon. There were reports of that display also from western Scotland, northern England and Ireland. A KLM pilot, eastward-bound over the western Atlantic, reported simultaneous aurora and noctilucent cloud at 0200.

"During 1974 mid-May to mid-August the clouds were reported on about 40 nights from the Atlantic and Western Europe.

"We are indebted to all of you who make these reports for us, and to others who extract the data and transmit them to us. Please accept our thanks for your help."

551.5:06:551.501.9

Mauritius: Two Hundred Years of Meteorology*

By K. Mülnier and B. M. Padya

Early records

The hurricanes of the south-west Indian Ocean are reason enough for people living in this part of the world to take notice of the weather. But the systematic recording of the weather sequence in Mauritius for over two centuries should be ascribed to the presence of men of science among the settlers and officials.

Among the earlier publications we note an account of the hurricanes of Mauritius and Bourbon (Reunion Island) from 1733–54 in the *Mémoires de l'Académie Royale des Sciences*, followed by articles in various learned publications about other hurricanes in the area.

The 1806 Annual Report of the Société d'Emulation de l'Ile de France (Mauritius) refers to the daily observations of Mr. de Céré, director of the Botanical Gardens at Pamplemousses. Mr. de Céré started his series of observations in 1774, when he acquired his thermometers and barometer. We also know that Mr. de Céré's barometer was not the only one from which records were being made in Mauritius.

The Government builds an observatory

The first public observatory was commissioned in 1832 by Colonel Lloyd, government engineer, on the wharf in Port Louis. Here again, observations of the weather, temperature, wind, humidity and pressure were only a secondary function as compared with the more urgent observations of the magnetic elements and the determination of time for the use of the residents and of ships calling at Mauritius.

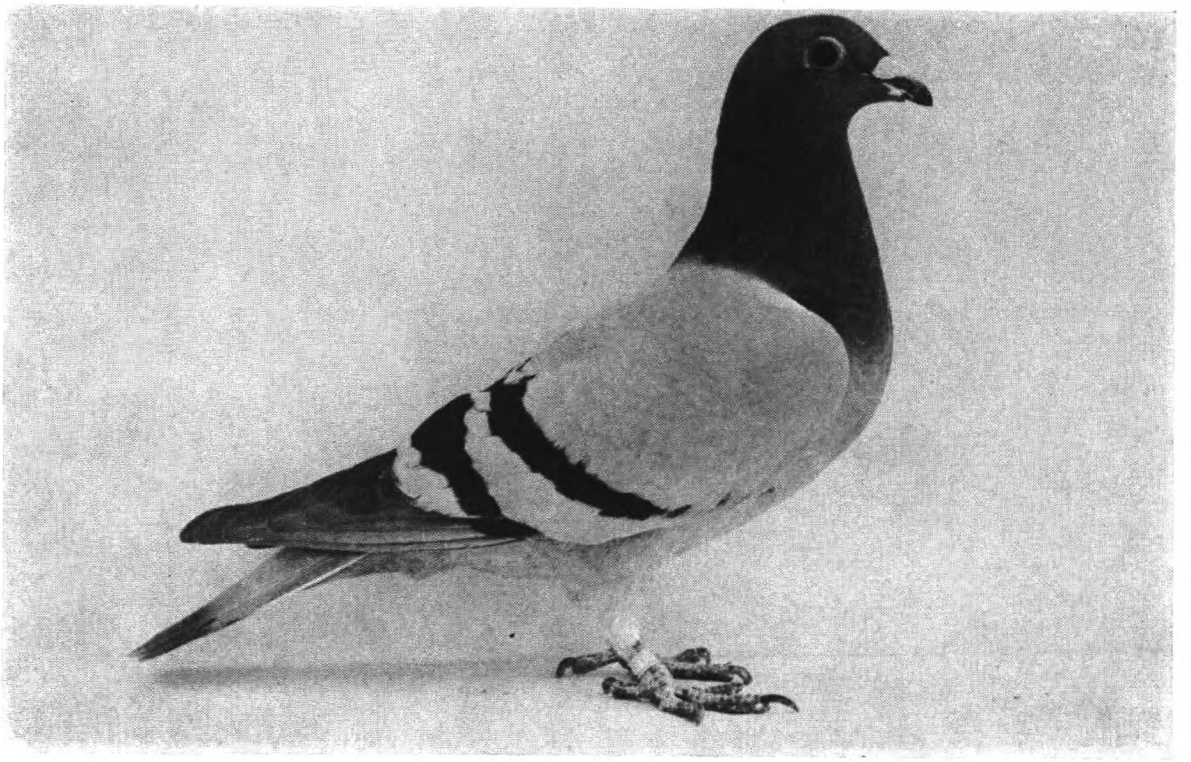
The Government Observatory was by nature purely functional. It continued its observations on a routine basis, with some gaps, until 1866, its meteorological activities being limited to noting down the weather elements twice a day and preparing a few averages. But in the meantime a Meteorological Society was established. The main driving force here was Charles Meldrum, a young professor of mathematics who came to the Royal College, Mauritius, in 1848. He took a keen interest in 'cyclonology' and in 1851 succeeded in persuading some high government officials, scientists, planters and military officers to get together under the patronage of the Governor to form a Society which would earnestly and seriously study the atmosphere. The existing observatory did not publish its observations and findings, a circumstance which was noted with regret at the inaugural meeting. The objects which the Meteorological Society laid down for itself were: to procure instruments of the best description; to provide for meteorological observations being made in Mauritius and its dependencies; to tabulate meteorological observations taken daily on board vessels in the Indian Ocean and to encourage these to be made on a systematic basis; and to collect, arrange and publish information obtained.

A clerk was employed by the Society to visit every ship anchoring in Port Louis Harbour. He used to present a letter from the Secretary of the Society to the master to obtain access to the ship's log, and copy the meteorological observations it contained. It is interesting to note that the Meteorological Service continued this practice right up to the 1960s.

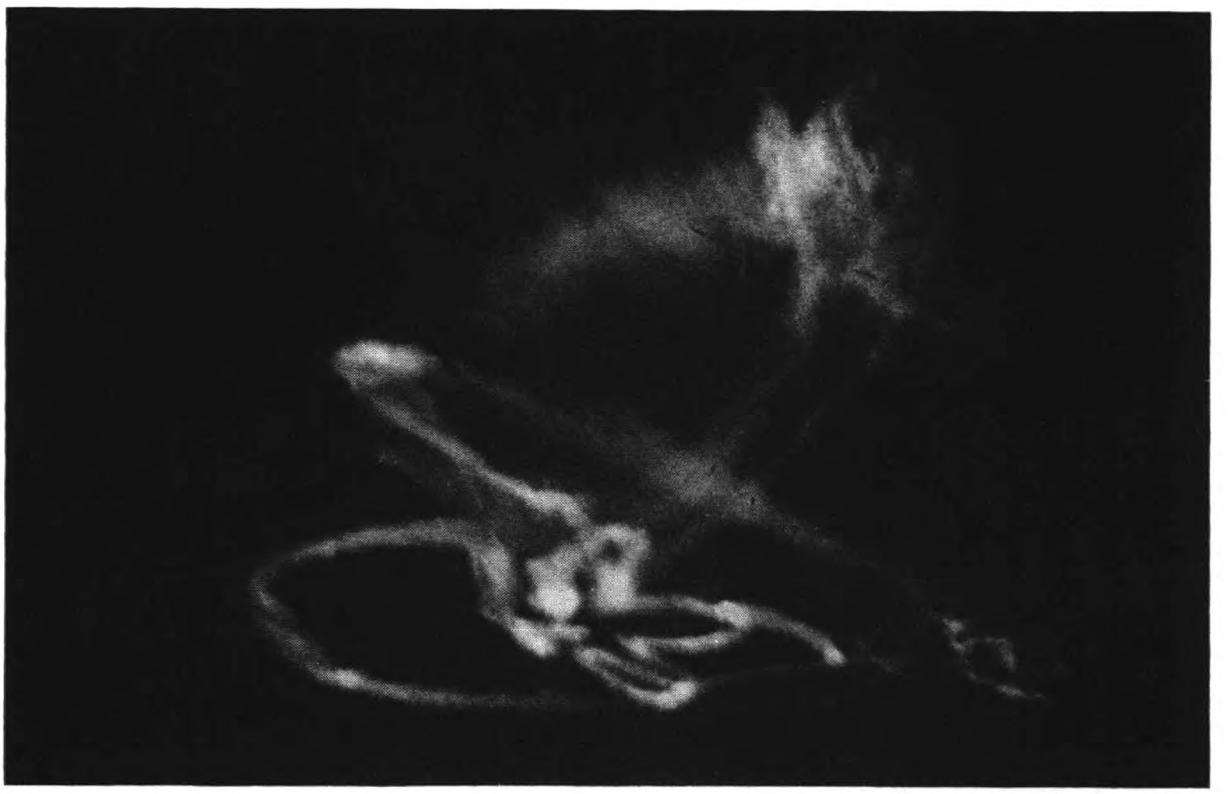
As could be expected, the Government Observer was not very pleased with the Society. To him its very establishment was a reflection on his inadequacy. The Society asked for hourly observations—it did not have any instruments of its own—and the Observer did not agree. The Society was authorized to rent rooms in the Government Observatory, but the rent was fixed so high that it had to vacate them

* This article is reproduced from the *WMO Bulletin*, Vol. XXIII, No. 4, October 1974, with the kind permission of the Editor.

(*Opposite page 72*)



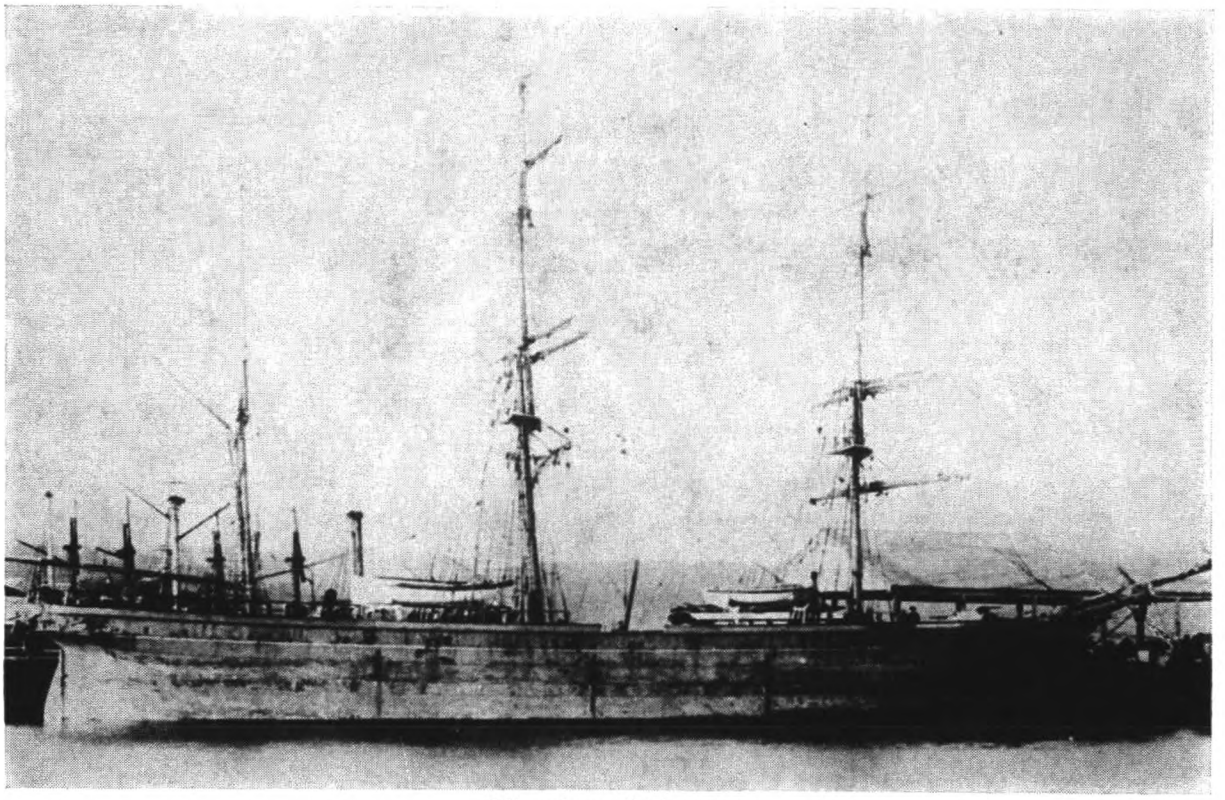
A typical racing pigeon (*see* page 77).



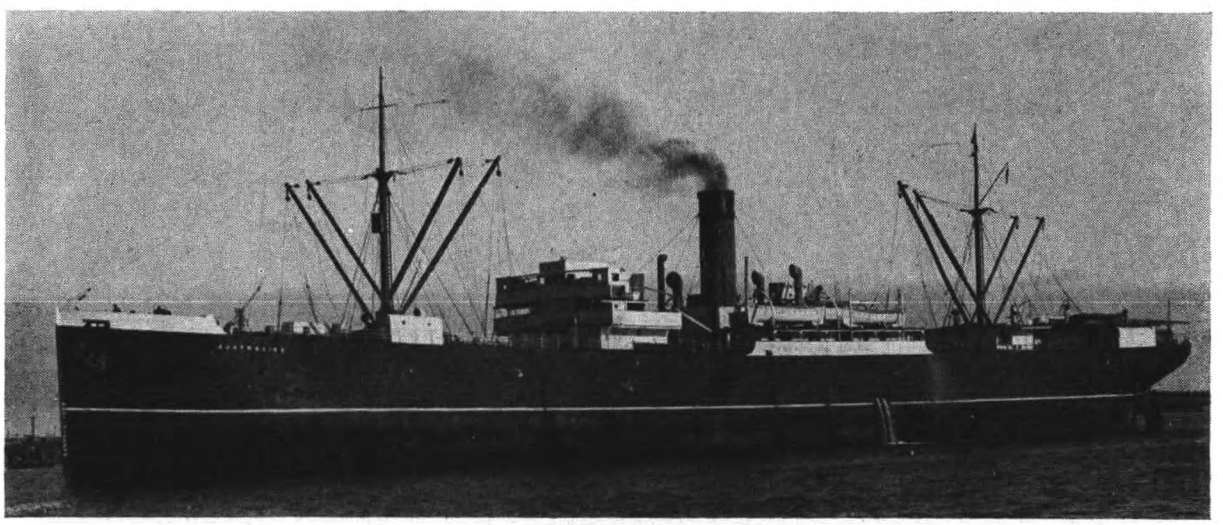
Photograph by R. A. Hardman

The luminous trail of a 'ball of fire' in the sky over Spain, the result of the malfunctioning of a French meteorological rocket (*see* page 80).

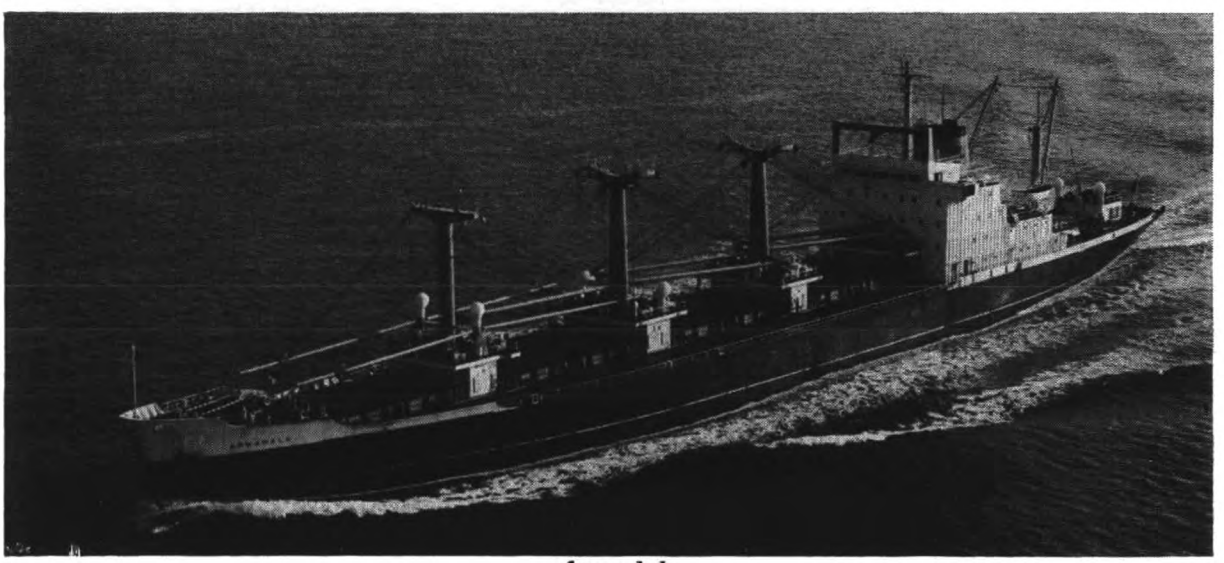
Opposite page 73)



Kingdom of Saxony



Australind



Armadale

THREE SHIPS OWNED BY TRINDER, ANDERSON & CO. LTD.

(*see* page 81).

in 1853. It was only in 1855 that the Society was allowed the use of the Observatory free of charge; this was the result of representations made to the Secretary of State for the Colonies (in England) on the usefulness of meteorological observations to commerce and navigation. The instruments ordered by the Society, which had arrived in 1853, were then installed.

A parallel observatory was built in 1852 by the British Army some two hundred metres from the existing one. This was part of the network of stations which was being established throughout the British Empire. It carried out six-hourly observations until 1858 when it was pulled down, presumably because it lay in the path of the railway system which was being constructed.

In 1854, the three functions of Government Observer, officer-in-charge of the Army Observatory, and Secretary of the Meteorological Society were given to the same man, Lieutenant Fyers of the Royal Engineers corps of the Army. There was thus no disruption of observations when the Army station was demolished: observations continued to be made in the original Government Observatory.

In 1861, Charles Meldrum was appointed Government Observer and could at last devote all his time and energy to meteorology. He made full use of the ships' logs which had been copied, and produced daily synoptic charts of the Indian Ocean for the cyclone periods of previous years.

This was made possible by the adoption by all commercial vessels of the convention of recording the weather at set times, introduced in the U.S. Navy by Lieutenant Maury. The decision was taken in September 1853 at a meeting of the major seafaring nations held at Brussels on the initiative of the American Government with the object of co-ordinating and organizing meteorological observations. As the observations contained in the log books of all ships were made synchronously, the long-advocated synoptic method could be applied.

Transfer to a more spacious, quieter site

In 1860, the Society felt that the location of the Observatory near Port Louis Harbour was unsatisfactory. The mountains prevented observations of the transits of circumpolar stars and deflected the winds. It also pointed out that the place was dusty and noisy and that "the vibrations caused by heavy traffic to the docks disturbed the instruments".

In a memorial addressed to the Governor embodying these objections, it was also stressed that "the Colony is admirably adapted for astronomical, magnetical and meteorological observations, especially the latter, being situated in the very track of the rotary storms of this hemisphere". It advocated a central observatory for hourly or two-hourly observations day and night together with a number of subsidiary observations at Rodriguez, St. Brandon, Agalega, Diego Garcia and Seychelles.

A committee composed of the President and a few members of the Meteorological Society visited various parts of the west coast and found a number of sites where the desiderata of a good horizon and freedom from local magnetic attraction were more or less satisfied, but ultimately the observatory was built at Pamplemousses in the northern plains because it was a fashionable suburb easily accessible by railway.

The Governor, Sir Henry Barkly, took great interest in meteorological science. His favourable disposition to the Society greatly helped towards the appropriation of the amount realized by the sale of the site of the Port Louis Observatory for the purpose of building the new one. In 1866, on the suggestion of General Sabine, President of the Royal Society, and of Admiral Fitzroy of the British Meteorological Office, Dr. Meldrum was sent to England to visit Kew Observatory to acquaint himself with the layout of an observatory and to acquire instruments. Plans and estimates were made in 1867. In 1870 the Duke of Edinburgh visited Mauritius. The Society considered his visit "a fitting opportunity for laying the foundation

stone of the new observatory ... A commencement to the erection of the main building was thus made under the most auspicious conditions". The Duke also became an honorary member of the Society.

In the period of transfer between the giving up of the old Observatory and the completion of the new, a house was hired in the village of Pamplemousses for the purpose of making meteorological observations as near as possible to the proposed observatory. By the end of 1874 the Royal Alfred Observatory was in operation and Dr. Meldrum was appointed its first Director. Magnetometers and magnetographs were installed early in 1875 and later in the same year an anemograph and a thermograph. Between 1885 and 1887, actinometers, earth thermometers, a sunshine recorder, ozone recorders and a pluviograph were set up. In 1898 a Milne seismograph was installed and remained in operation until 1920.

In the field of astronomy the main function of the Observatory was the provision of a time service. But some work of an academic nature was also undertaken such as, for instance, the study of double stars. Daily photographs of the sun made with a 4-inch Dallmeyer photoheliograph were sent to London to supplement those taken at Greenwich, Dehra Dun and the Cape. The photographs from the Royal Alfred Observatory were, however, seldom required and the instrument was put out of commission soon after its installation.

The Royal Alfred Observatory was not without its problems. Malaria had made its appearance in 1867 and a severe epidemic lasted up to 1869, after which it established itself as an endemic disease in the low-lying areas.

The headquarters goes to Vacoas

The unhealthiness of the site brought Mr. Claxton, the Director of the Observatory, to make an objective and dispassionate re-estimation of its advantages. He found that in spite of its distance from the hills the locality was subject to considerable magnetic attraction. On the other hand, the mountains rose to over 600 metres all along the southern horizon, and no sea horizon was visible to the north. The staff of the Observatory was authorized to live up-country; efficient control and inspection were thus difficult. Evening observations had been stopped in 1885.

In 1922, permission was obtained to rent a small portion of land from the military authorities at Vacoas. The station was intended primarily to serve as an aerological station for the study of the currents of the upper atmosphere by means of pilot and sounding balloons, and also as a time-determining station.

The station at Vacoas was completed in 1925. It consisted of one office of about 50 square metres, an anemometer hut, a few outhouses, and a transit building for the determination of time. The simpler meteorological observations appropriate to a high-level station were made. The station at once became the headquarters of the Department. The senior staff resided nearby, worked mostly in the Vacoas office and visited the Royal Alfred Observatory only once or twice a week. Most of the junior staff continued, however, to work in Pamplemousses.

The technological advances of the twentieth century brought about profound changes in meteorological practice. Aviation and shipping demanded more precise and elaborate observations and forecasts; the development of radio communications made these possible. Originally a science which appealed only to inquiring minds, meteorology was fast developing a consumer-orientated outlook. The scientists and research workers were becoming all the more active as the means of investigation became more sophisticated, but the less glamorous function of providing data and forecasts routinely to an ever-increasing number of users was asserting itself as the main purpose of Meteorological Services.

The Mauritius Meteorological Service established its first outstation 350 miles away at Rodriguez in 1902 as soon as a cable connexion became available. But the other outstations—Diego Garcia, St. Brandon, Agalega—had to wait until military

necessity made itself felt during World War II. In the meantime, pilot-balloon observations were started in Vacoas in the 1920s.

Between 1930 and 1950 the Mauritius Observatory Department gradually focused attention on meteorological functions and gave up other interests. Astronomy had already been reduced to a time service which was discontinued in the early 1940s, regular time signals on the wireless having made it redundant; observation of the electric potential of the air was discontinued in 1941; the Milne seismograph had already gone out of commission in 1920; the determination of ozone in the surface air was stopped. Magnetic observations were, however, continued and are still being made.

It would be futile to deplore this shrinking of the field of interest of the Observatory. The observations obtained in the branches that were abandoned had been of only marginal value, and the limited resources could be more usefully employed by concentrating all efforts where they were most needed. This stand was definitely asserted when the Observatory's name was changed to Meteorological Department in 1959, when the site of the Pamplemousses Observatory was taken over by the health authorities for the erection of a large, modern hospital. The Royal Alfred Observatory building was pulled down in 1961.

Present status and future outlook

The Meteorological Service provides forecasts on the air routes to and from Perth, Bombay, Johannesburg, Mombasa, Nairobi, Tananarive and Réunion. Broadcasts for shipping are made on two channels: on short wave for the area covering the Indian Ocean to latitude 40°S and longitude 105°E and on medium wave for the area between the Equator and 35°S, and between 50°E and 80°E.

The provision of storm warnings to ships on the high seas and to the population of Mauritius continues to be an important function of the service. Weather forecasts are issued twice a day to the Mauritian public. The Meteorological Service is planning considerable improvement in its telecommunications in the next twelve months.

With the current emphasis on industrialization and the diversification of agriculture, the department has to face a large number of requests for climatological and weather information. This expansion in meteorological activities has laid bare the inadequacies both in the professional training of the staff and in the facilities for the processing of data. An ambitious programme of re-training has been undertaken, and here the World Meteorological Organization (WMO) and some States are giving valuable assistance. The agrometeorological and hydrometeorological divisions of the Service will be expanded. At the same time a start is being made with the storage of available data on cards and magnetic tape.

Radiosonde/radar-wind observations were started at Vacoas in 1956. In the 1950s it was found necessary to increase the professional staff from two to eight, and the Assistant establishment was also considerably increased. Subsequently the department's growth has been proceeding at the same rate as other departments—an inevitable consequence of general economic growth.

It was only after World War II that Mauritius started to "take its part in the work of International Meteorological Organization" as the annual report puts it. When the International Meteorological Organization joined the United Nations' family as the WMO, Mauritius became a Member territory. It participated actively in the work of the Organization. Although its limited resources only permitted it to send delegates to attend those meetings which directly concerned it, a considerable volume of correspondence was maintained.

In 1968 Mauritius acceded to independence and became a Member State of the Organization. Meteorology being essentially international and even global in nature, it is unnecessary to state that the Mauritius Meteorological Service is keeping the

best possible relations with the Organization as a whole and with its Members individually. Indeed the Service is most appreciative of the co-operation it is receiving from these quarters.

The planned programme of expansion will enable the Meteorological Service to help effectively in the industrial and agricultural development of the country while continuing to provide a forecasting service to the public and to international transport services.

551.5:598.2:798

Racing Pigeons

By Major L. Lewis, M.B.E.
(General Manager, The Royal Pigeon Racing Association)

The racing pigeon is an eater of hard grain with maples, maize, wheat and barley being its chief diet. However, when very tired due to overtaxing its strength, a lighter diet of groats, lentils, split peas, or even rice is beneficial as is the addition of glucose to the drinking water. The average, healthy, racing pigeon (*see* photograph opposite page 72) should be fed about 1¼ ounces of grain each day, though when distressed three feeds of approximately half an ounce per feed per day suits the bird better.

Every racing pigeon carries a registration ring which may be metal, or metal covered with plastic, on which such details as NU 74 A 12345 may be found. The prefix letters NU indicate that the ring has been issued by the Royal Pigeon Racing Association (R.P.R.A.), the figures 74 (written athwart the ring) its year of birth, and A 12345 its registration number. The R.P.R.A. require full and complete details carried by the ring in order to trace its owner. With effect from 1976 the prefix letters GB will be used in lieu of NU.

A pigeon race is unlike any other race, in that whilst there is one start point, there are literally hundreds of potential winners, for each competitor's loft is a possible winning post. Identification, distance flown, and the time taken to fly it, are of the very essence.

A racing-pigeon fancier, entering his bird in a race, will first of all complete his race entry form with the colour, sex and registration ring details of each pigeon being entered in the race. On arrival at the club-house his basket of pigeons is handed over to a race marking committee, one of whom takes over the race sheet. As each pigeon is removed from the basket its colour, sex and ring data are read out and cross-checked against the race sheet. Each pigeon has affixed to its leg a rubber/plastic 'garter' which is coded and numbered, inside and outside, and is specific to that one pigeon and one race only. The 'garter' details are entered on the race sheet against the appropriate pigeon which is then placed in a race pannier. The owner takes no part in this and once his race sheet is handed over he never sees it again. This takes care of the identification aspect.

Each racing pigeon owner owns a specially designed timing clock, and whilst the pigeons are being race marked, the pigeon clocks will be wound, set, started against Master Time (BBC time signals) locked and sealed with a numbered seal. All details, time set and started, seal number, etc. are recorded in the club record book.

The pigeons are then taken by a purpose-built, road transport vehicle to the race point and, after detailed study of the weather report and consultation with the officials at the home end, the pigeons are released. As soon as a pigeon arrives home the owner must remove from its leg the 'garter', place it in the timing clock, and turn a handle which causes to be recorded, either by punctured details, or an internal print out, the day, hour, minute and second of timing in. Within two hours of 'clocking', the owner takes his clock to the club-house where it is struck against Master Time, opened, the 'garter' details cross-checked against the race sheet, and the exact time of flight ascertained.

Each racing pigeon loft is accurately located to two places of a decimal of a second, as are race points, with the distance between the two being calculated by computer to the nearest yard. It is then a question of dividing the time taken into the distance flown to obtain the flying speed of the pigeon which is expressed in terms of yards per minute. The fastest pigeon wins the race.

The speed of flight depends upon the weather, and in particular the wind. In strong tail-winds speeds very much in excess of 2,000 yards per minute have been recorded. However, a general average over the season would be around the 1,100 yard per minute mark. Some amazing performances have been accomplished. Quite

recently a pigeon, "Woodsider" by name, won the Barcelona race, flying 857 miles into Yorkshire at an average speed of some 30 miles per hour. A truly remarkable performance.

As the sport expands, which it is, so does the selling price of the really big winners. In 1973 the sum of £5,000 was paid for one pigeon which, at a body weight of approximately 14 ounces, makes it the most expensive pedigreed bloodstock in the world.

I doubt very much whether the weary travellers which alight on your ships from time to time are in the £5,000 bracket, but they will be good birds, made better by the care and attention I know they will receive from you, for which I send my grateful thanks and appreciation.

A Rare Mollusc from Ocean Weather Station 'Juliett'

By R. Williams
(Institute for Marine Environmental Research, Edinburgh)

During a recent voyage of Ocean Weather Ship *Weather Reporter* (17th May–18th June 1974) to Station 'Juliett' (52° 30′N, 20° 00′W) a rare planktonic organism was caught on the sea surface by the Bosun, Mr. Angus McLeod and the Donkeyman, Mr. Ted Hayward. The specimen was sent to the Oceanographic Laboratory (I.M.E.R.) by the Acting Chief Officer, Mr. P. Swan.

The animal caught at Station 'Juliett' belongs to the same group of organisms as the limpets and winkles found on the seashore. They are classified as gastropod Molluscs, and this particular specimen belongs to a sub-group of Gastropoda known as the Heteropoda. It has no common name and is known as *Carinaria lamarcki* Péron and Lesueur, 1810 (Péron and Lesueur being the first workers to describe this animal in 1810). This specimen was of particular interest as it was in perfect condition—an unusual occurrence as they are rather delicate and the shells are easily damaged by the nets used to sample the plankton.

Carinaria has a body covered with a thick, almost transparent skin or cutis studded with small bumps or tubercles (*see* Fig. 1 and photographs opposite pages 80 and 81). Beneath the cutis, partly obscured by the jelly-like substance, are intercrossing muscular bundles. It has a very small shell into which the animal cannot retract, a ventral swimming fin, a thick proboscis with a powerful mouth (*see* photograph 4), prominent eyes, an alimentary system, heart, kidney, gills and gonads. This specimen is an adult male as can be observed from the copulatory apparatus on the right side of the body (*see* photographs 1 and 3). It has a total length of 90 millimetres which is comparable with previous animals collected in the open Atlantic, although specimens of 220 millimetres have been recorded from the Mediterranean. The animal occurs in the warmer upper layers of the ocean where it finds its food.

Carinaria are thought to be highly mobile and active in catching their prey which they detect by sight (Van der Spoel[1]). There are numerous Atlantic records of this species south of 40°N especially in the Caribbean and Sargasso Sea. The most

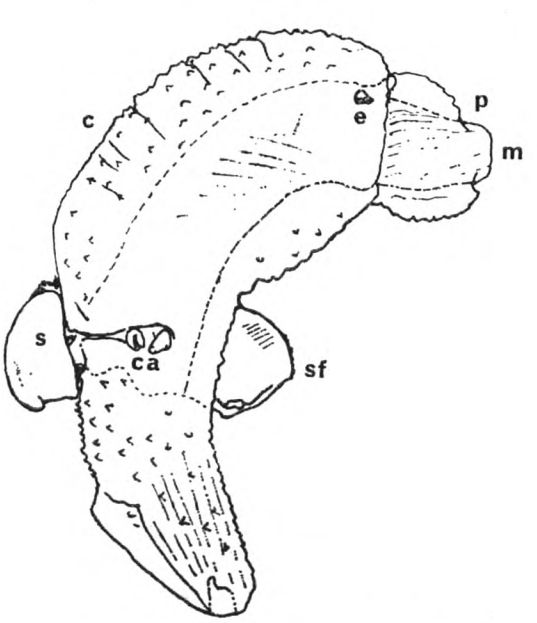


Fig. 1. *Carinaria lamarcki*: **c = cutis, e = eye, p = proboscis, m = mouth, s = shell, c.a. = copulatory apparatus, s.f. = swimming foot.**

northerly records were 47° 02′N, 31° 45′W and 49° 49′N, 30° 22′W in the summer of 1931 (Tesch[2]) and it has also been observed off the south-west coast of Ireland (Massy, 1907 from Tesch[2]). It is the only Heteropod species penetrating into the temperate regions and this specimen from Station 'Juliett' is the most northerly record in the Atlantic.

REFERENCES

1. VAN DER SPOEL, S. Notes on the identification and speciation of Heteropoda (Gastropoda). *Zoologische Mededelingen*, 47 (45), 1972, pp. 545–560.
2. TESCH, J. J. Heteropoda. *Dana Report*, 34, 1949, pp. 1–53.

SPECTACULAR FLYING OBJECT OVER SPAIN

The photograph opposite page 72 shows the complicated luminous trail of a glowing object in the sky, seen by thousands of people all over Spain on 12th June 1974 in the late afternoon and evening.

Mr. R. A. Hardman, Chief Officer aboard m.v. *Panther* which was leaving Puerto de Pasajes harbour at the time of the first sightings, was able to photograph the phenomenon. It was also extensively reported by the Spanish press. Accounts of the phenomenon were received from many parts of Spain including Madrid, Tarrasa, Castellón de la Plana and Barcelona (see Fig. 1).

The object was first seen over Pasajes, moving towards Madrid. It suddenly started to zigzag and take on an orange hue. Soon a figure-of-eight trail was formed within concentric circles. At this point it was thought that the orange colouring could be attributed to the late evening sunshine being reflected by the body of the 'UFO'.

Almost the whole population of Tarrasa watched the brilliant orange glow for

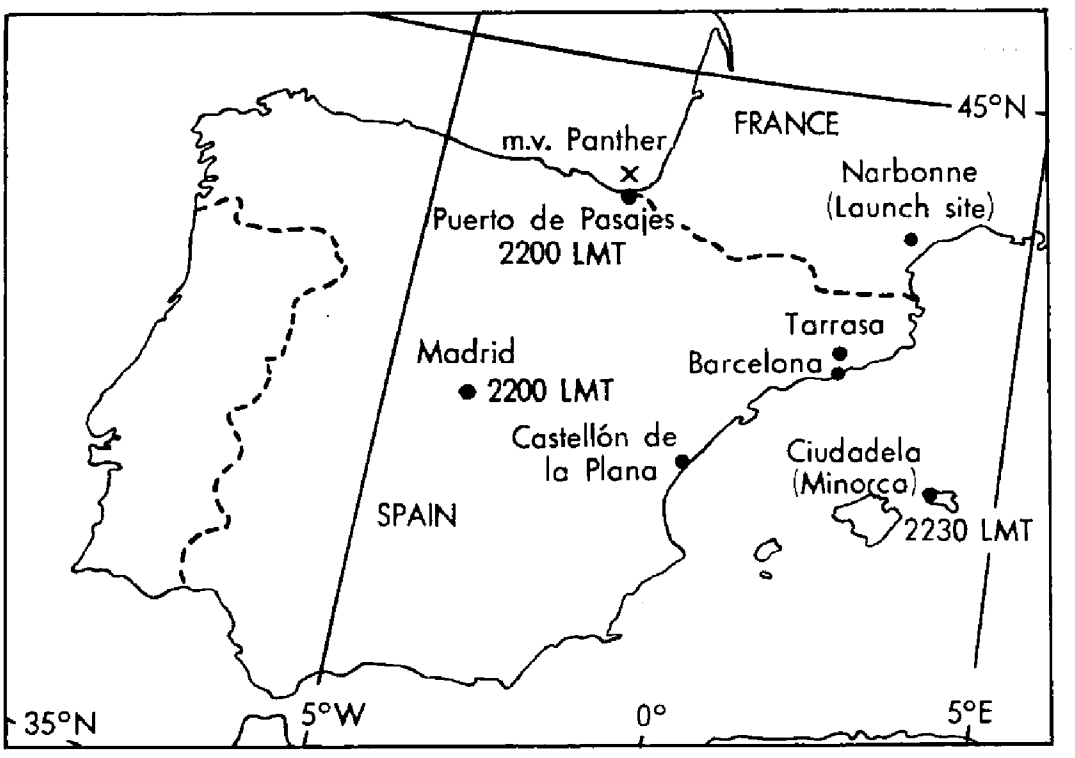
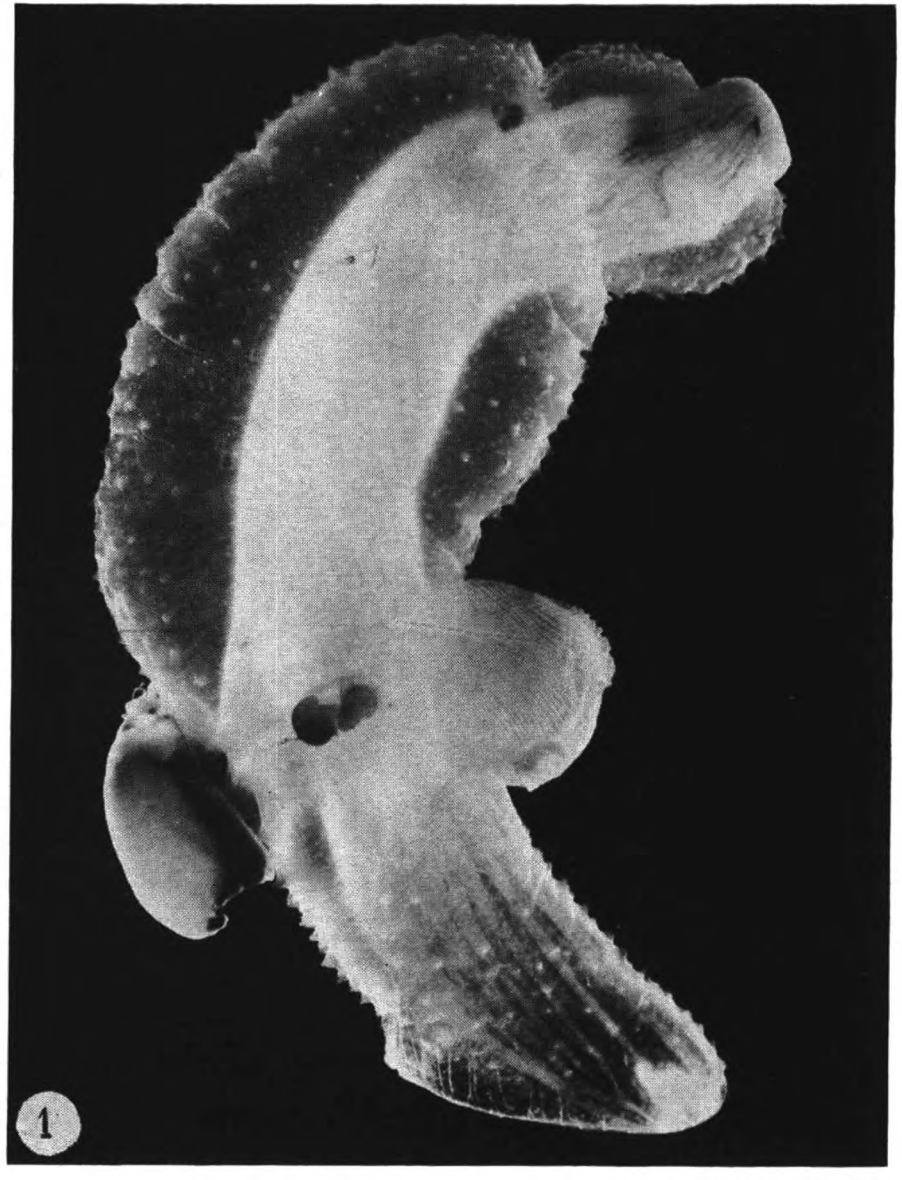
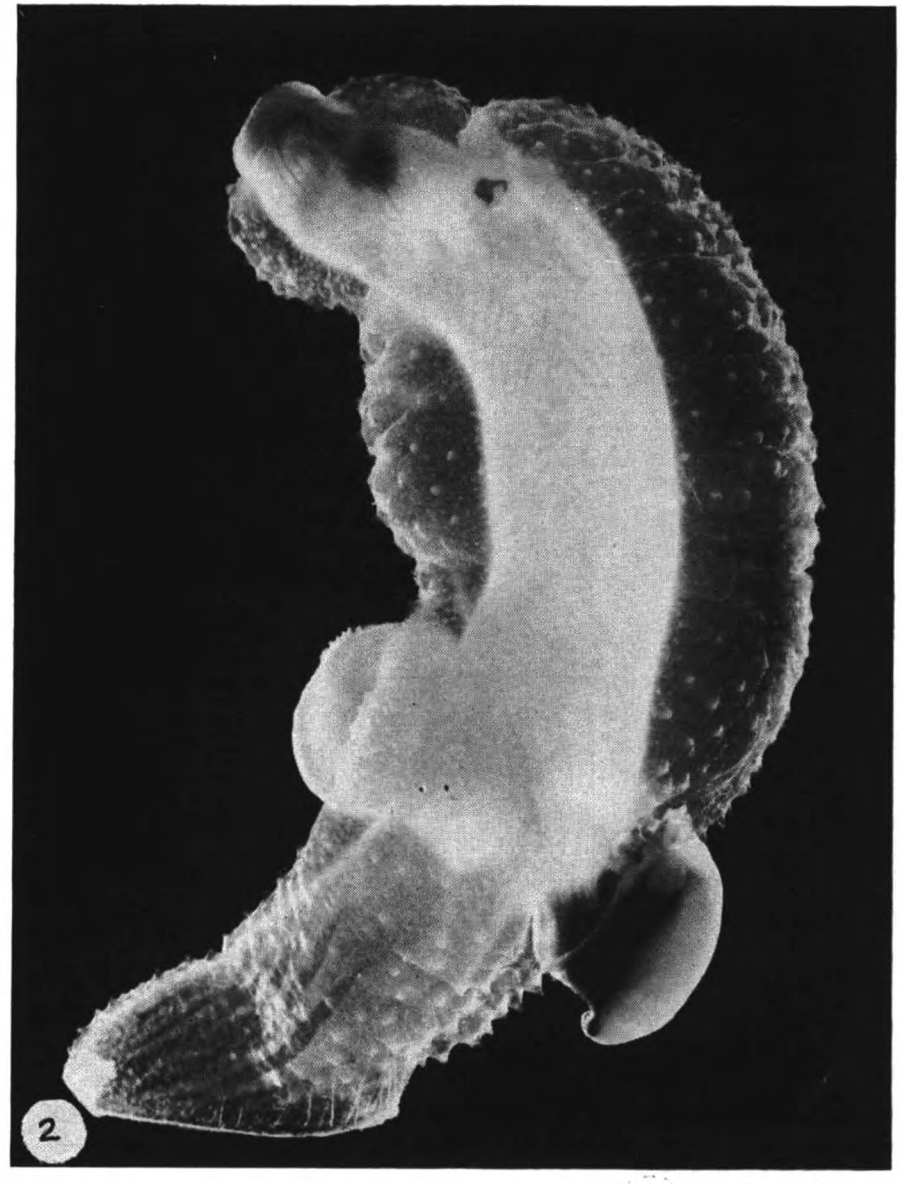


Fig. 1. Map showing the launch site and other places named in the text.



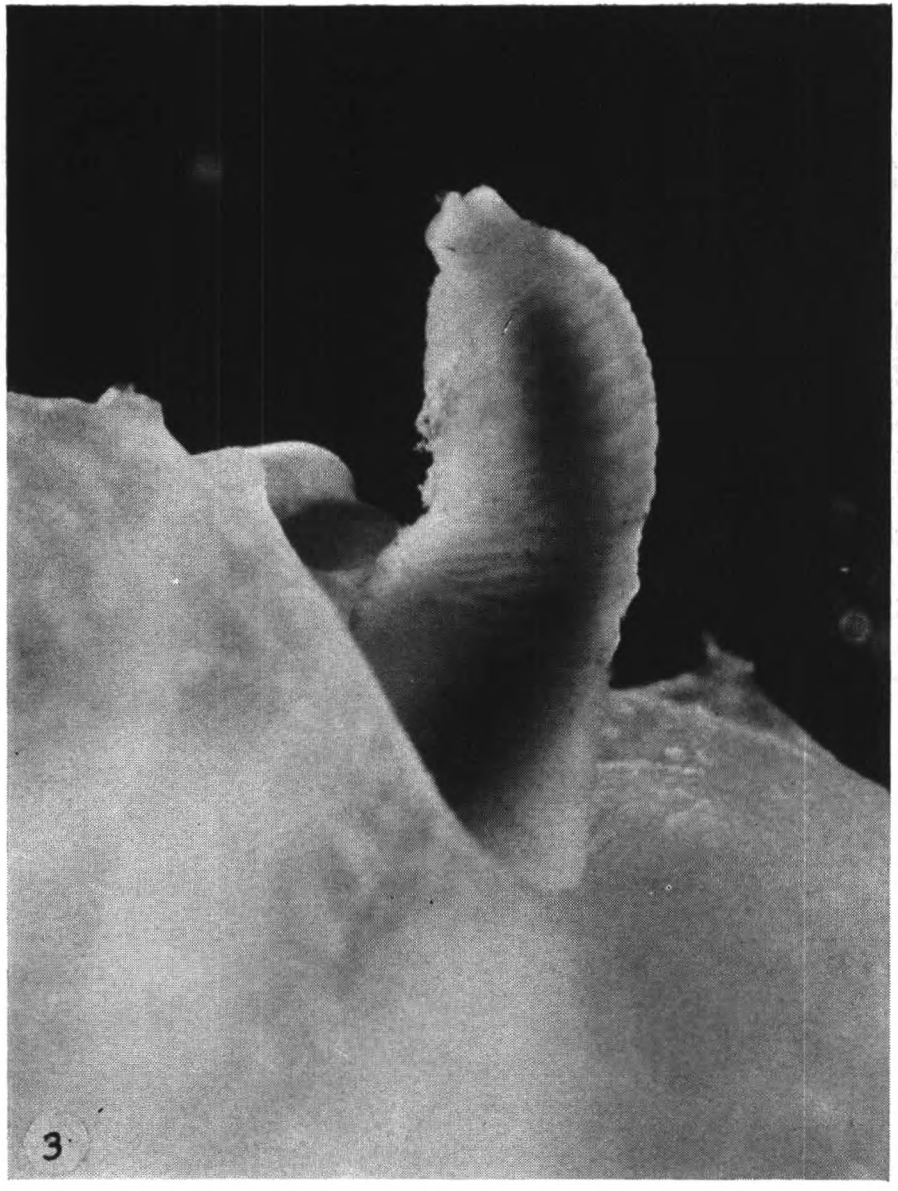


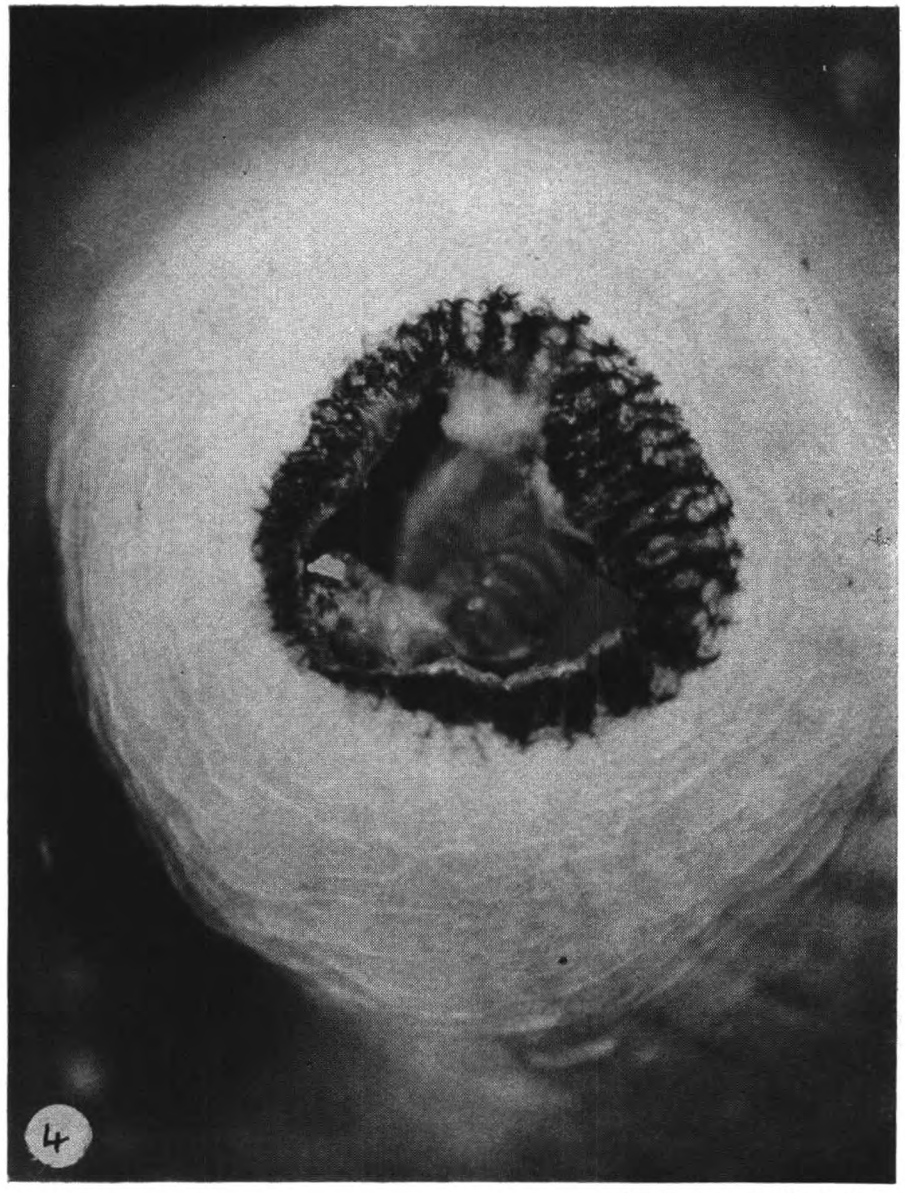
Photographs by T. S. Bain

Carinaria lamarcki, a mollusc from Station 'Juliett' in the north-east Atlantic: (1) animal viewed from the right; (2) animal viewed from the left (*see* page 79).

(*Opposite page* 80)

(*Opposite page* 81)





Photographs by T. S. Bain

Further enlargements of *Carinaria lamarcki*: (3) copulatory apparatus of the male; (4) mouth, showing teeth or radula (*see* page 79).

about half an hour. To the unaided eye, it appeared to be more than 100 metres wide and 80 metres high. The lower part of the glow began to show flashes of yellowish-red and, towards the end of the display, there was a large explosion which reduced the object to a smaller, longer and less bright mass. By 2315 the glow had virtually disappeared, leaving only three reddish-blue bands of the trail in the sky. Similar observations were reported from Barcelona and various ideas were put forward as to the origin of the phenomenon; never before had a UFO been so clearly viewed for such a length of time.

In Madrid the strange object was observed from Barrajas Airport at 2200. Passengers saw a plainly visible luminous trail of great length which caused much excitement and the observations were passed to the Madrid Astronomical Observatory. At 2230 in Ciudadela, Minorca, it was seen as a large, shining, circular mass with a long wavy tail of an intense red colour reaching almost to the horizon.

Eventually the UFO was identified as a French meteorological satellite which had malfunctioned after being launched from Narbonne earlier that day. The ignition stage of the launch was still in operation and it was this that caused the brilliant orange glow. In all, the satellite was visible for about an hour.

We are grateful to Chief Officer Hardman for sending us this report, with photographs, and a copy of the San Sebastian newspaper *La Voz de España* where the phenomenon was fully reported.

A CENTURY OF VOLUNTARY OBSERVING—TRINDER, ANDERSON & CO. LTD.

Following our usual practice of annually publishing an illustrated feature concerning ships of one owner covering a century of voluntary observing, we continue with ships of Messrs. Trinder, Anderson & Co. Ltd. (*see* photographs opposite page 73).

The firm of Trinder, Anderson & Company was formed in 1873 by Oliver Jones Trinder and John Rogerson Anderson who in the earlier days, either as owners or managers, operated sailing ships and later steamships on the Australian run. Their first recorded voluntary observing vessel was the *Kingdom of Saxony*, as shown in our first photograph. She was recruited in London on 8th December 1873 and was a three-masted barque of 558 G.R.T. with a carrying capacity of 1,115 tons. In her first meteorological logbook it was recorded that she was commanded by Captain W. C. Smith and made the voyage from London to Madras, commencing on 3rd January 1874 and arriving at Madras on 22nd May, a passage of 139 days.

Captain Smith's logbook was assessed as Excellent by the Meteorological Office at the end of the voyage. It was meticulously kept at all times and contained entries such as: "water dark green, peculiar smell, fishy, seaweedy, as if clothes drying" and "immense shoals of fish (Grampus?) and birds (few)", these observations being made while the vessel was north of the Cape Verde Islands in January 1874.

Doubting the accuracy of his Walker's A.1. log between 0900 and noon on one occasion, Captain Smith wrote in his logbook: "I put Massey's Patent Log out too, and also measured 100 feet of main deck and found speed of ship by throwing a piece of wood over for'ard and timing it; mean of 4 trials, at intervals of half an hour, gave 8·5 knots."

At least one more of the Company's ships was a member of the Voluntary Observing scheme in the 1890s; she was the *Minero*, an iron barque of 478 tons.

Our second photograph shows the first of four ships of the same name; this was the *Australind* which was the Company's first steamship and was built in 1904, being commanded on her maiden voyage by Captain C. Angel. This vessel survived World War I, having been employed on fleet transport between Southampton and France. She was sold in 1927 and was replaced by another vessel of the same name.

The second *Australind* was sunk by an enemy raider in the Pacific in August 1941 and was replaced by the third *Australind* which was delivered in October 1944.

This vessel was recruited in 1946 and spent the next 13 years as a member of the Voluntary Observing Fleet until being sold in 1959.

The fourth *Australind* was built in 1961, and is still in service. She was recruited by the Meteorological Office in the same year and has given us loyal service ever since.

The newest of Trinder, Anderson's ships, the *Armadale*, shown in our third photograph, is the third *Armadale* to be owned by the Company; she was built by Austin & Pickersgill Ltd. and delivered in 1970. She is a motor ship of 10,388 G.R.T. and is the first ship of the SD 15 type. She was recruited by the Port Meteorological Office in Liverpool on 8th October 1970 and sailed for Australia via the Cape on her maiden voyage under the command of Captain R. J. Ogilvy.

It is with pleasure that we can now express our gratitude to Trinder, Anderson & Co. Ltd. and to all their masters and officers, both past and present, who have given us so much of their time voluntarily over the past century.

At the present time we have five of the Company's ships as members of the Voluntary Observing Fleet, three of which it manages for the P. & O. General Cargo Division.

J. D. B.

SPECIAL LONG-SERVICE AWARDS

Every year since 1948 the Director-General of the Meteorological Office has made special awards to the four voluntary marine observers whose long and enthusiastic service on behalf of the Meteorological Office is considered worthy of a special award.

All officers who have provided us with meteorological records in fifteen or more years, and who have compiled at least one meteorological logbook in the previous year, come within the possibilities of being selected for the special awards. Personal cards are scrutinized; length of service combined with the number and quality of their records decides the order of placings.

This year there were again 94 officers with the necessary service, over fifteen years; these years are very seldom continuous but often cover periods of thirty years or more.

The Director-General is pleased to make the special awards to the following shipmasters:

1. CAPTAIN A. B. STALKER of the P. & O. Lines, whose first meteorological logbook was received here in 1948 from the *Kent*. During his 21 years of voluntary observing he has sent us 38 meteorological logbooks, of which 34 were classed as Excellent.
2. CAPTAIN J. H. B. WESTON of the P. & O. Lines, whose first logbook was received here in 1950 from the *Devon*. In his 21 years of voluntary observing he has provided us with 37 logbooks, 34 of which were classed Excellent.
3. CAPTAIN D. G. THOMAS of Manchester Liners, who sent in his first logbook in 1947 from the *Manchester Trader*. He has 24 years of voluntary observing to his credit and has provided us with 55 meteorological logbooks, 22 of which were classed Excellent.
4. CAPTAIN G. V. BARNES of the Bristol Steam Navigation Company. He supplied us with his first meteorological logbook in 1955, from the *Apollo*, the ship in which he was still serving until his recent retirement. Altogether Captain Barnes has sent in 24 logbooks, all of which were classed Excellent.

As in previous years, the award will be in the form of a suitably inscribed barograph, and it is with pleasure that we congratulate these four shipmasters on this acknowledgement of their many years of voluntary meteorological work at sea.

They will be notified personally of the award and of the arrangements which will be made for its presentation.

J. D. B.

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM OCTOBER TO DECEMBER 1974

The charts on pages 84 to 86 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 upto 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 most significant development during the month was an unusually rapid formation of ice in Foxe Basin and the western part of Hudson Bay. By the end of the month the ice development was about 2 weeks ahead of normal and this was associated with temperatures well below average especially over western Hudson Bay. In Baffin Bay the overall cover was near to normal in spite of higher than normal air temperatures. In the Greenland Sea, where temperatures were near normal, the deficit of the previous months remained. In the northern Barents Sea, the excess of the previous month changed to a deficit although there were no marked anomalies to account for this. In the Kara Sea there was a slight excess, probably due to the slightly lower than normal air temperatures.

November

In Hudson Bay the rapid development of ice continued so there was still an excess over normal by the end of the month though air temperatures were, on the whole, higher than average (as opposed to the very low temperatures of October). Over Baffin Bay and Davis Strait the ice developed much as normally except that there was less ice than usual in the south near Cumberland Sound, where air temperatures were somewhat above average. The deficit of ice in the Greenland Sea was maintained. With an anomaly for south-easterly winds the ice edge was, in places, as far as 150 miles north-west of the normal position for the end of November. Similarly, in the Barents Sea there was a deficit of ice; this deficit became, in fact, more extensive during the month because of anomalous winds from the south-west.

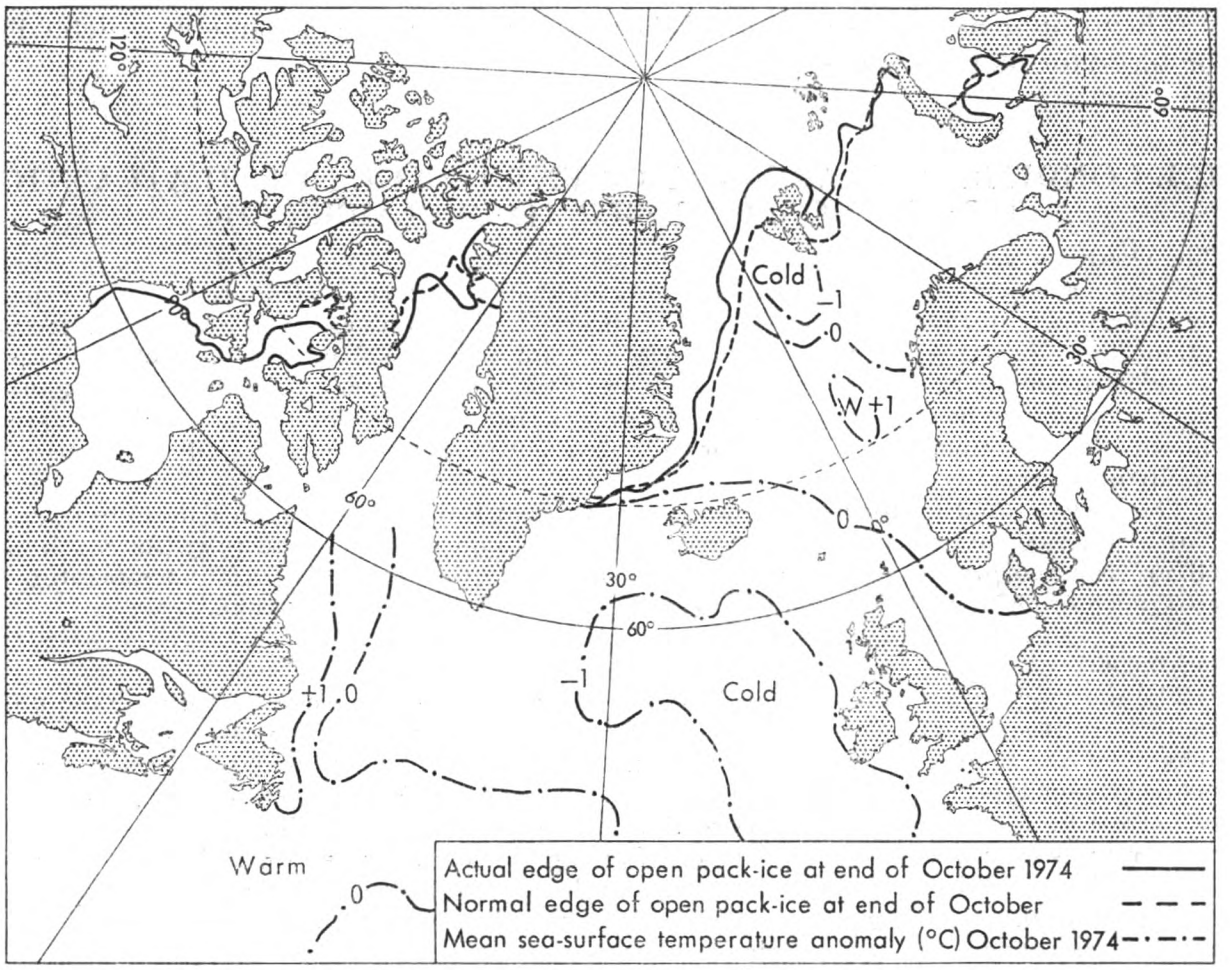
December

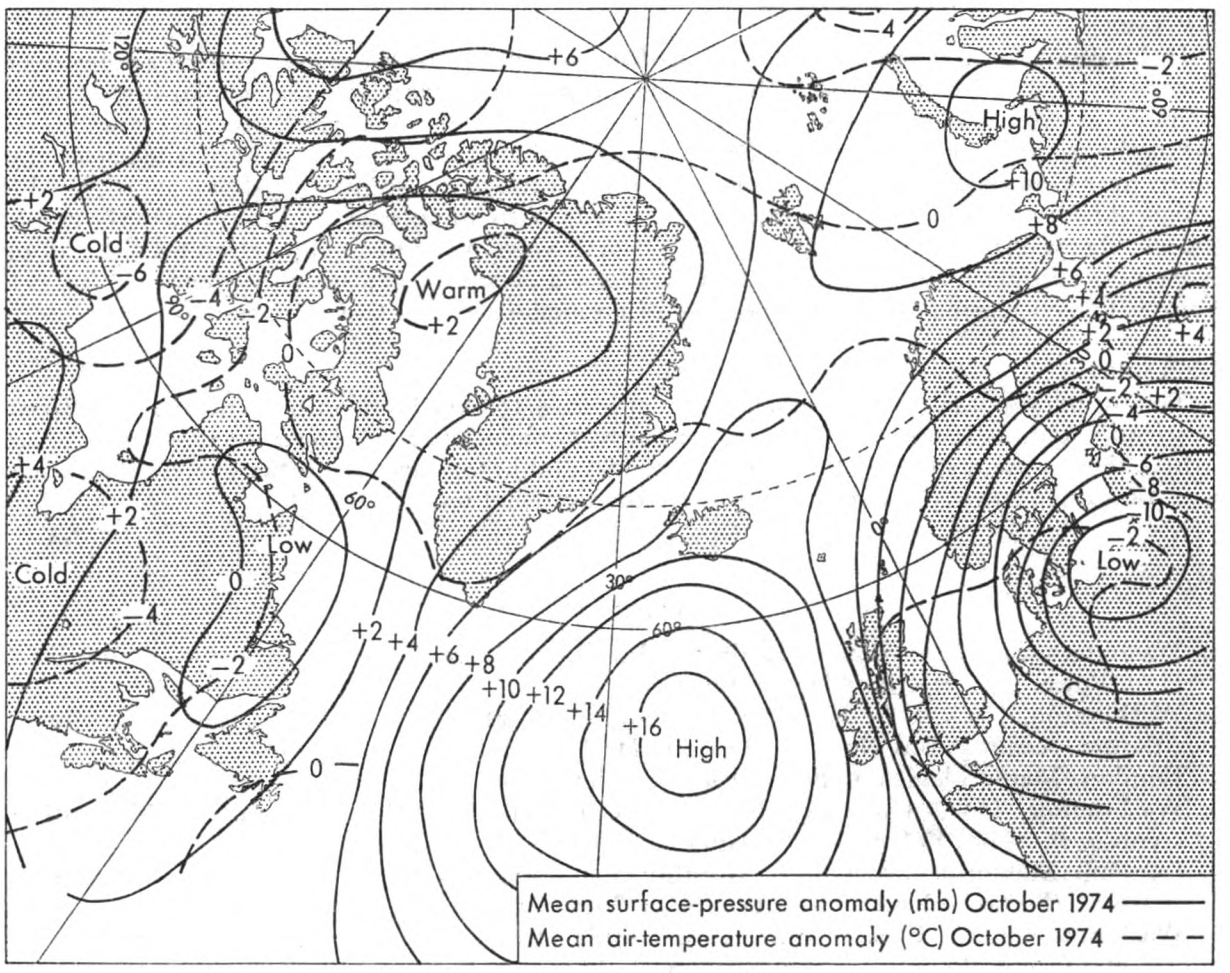
The formation of ice to a concentration of at least 4/10 over Hudson Bay and Hudson Strait was completed, as is normal, during the month. Deficits of ice persisted in the Barents Sea (where there was an anomaly for southerly winds) and in the Greenland Sea (where the deficit was somewhat reduced on account of lower than normal temperatures).

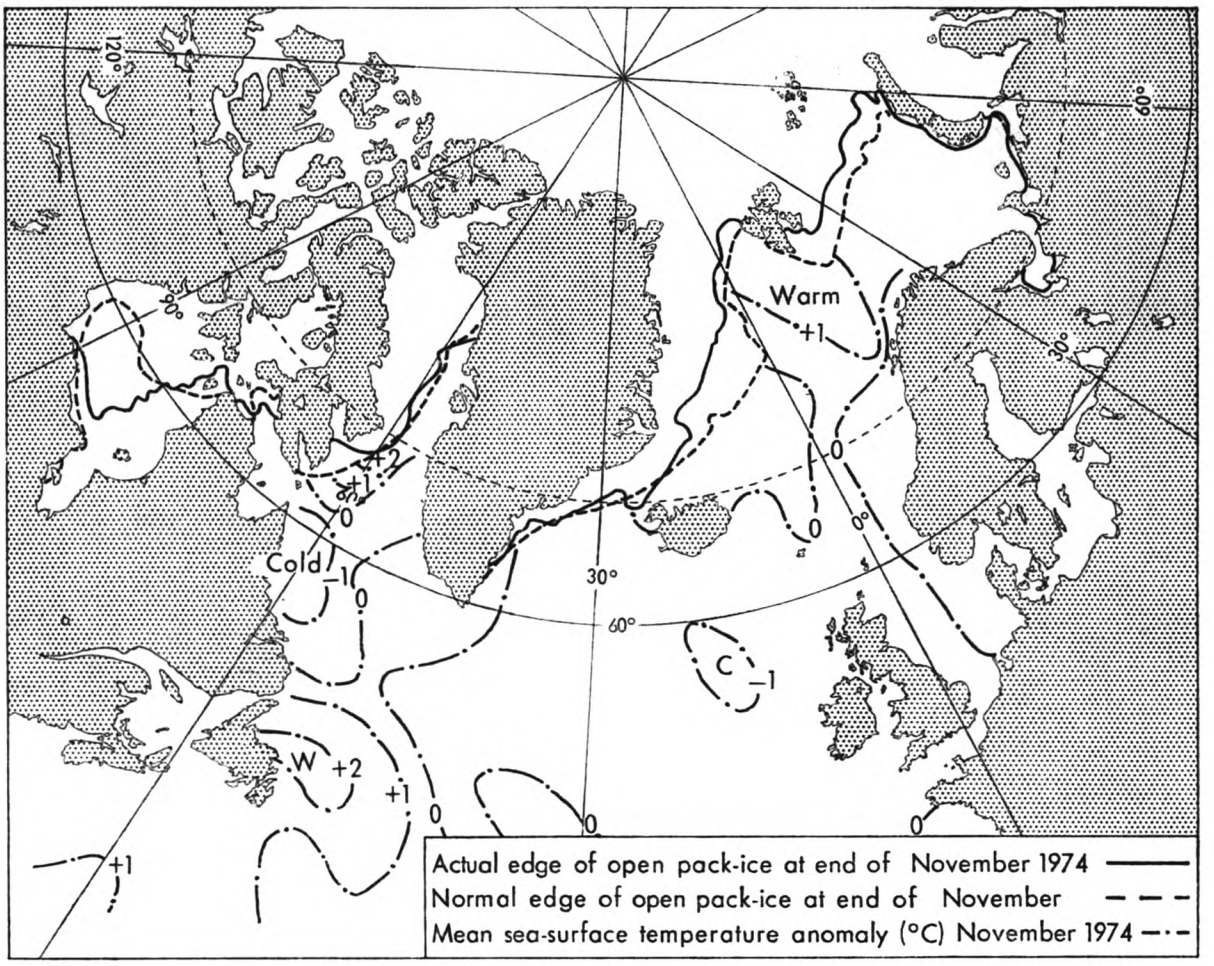
P.A.

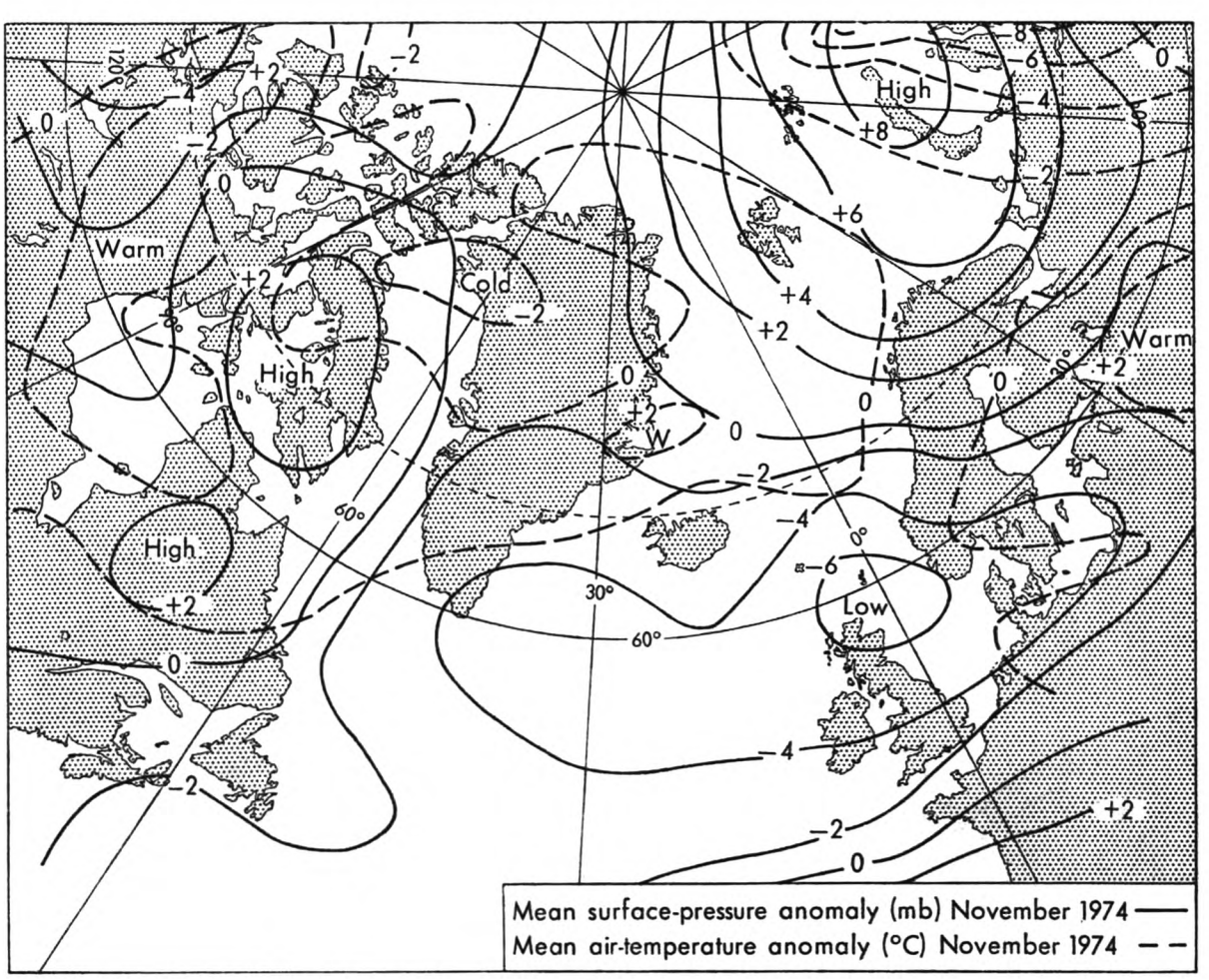
REFERENCES

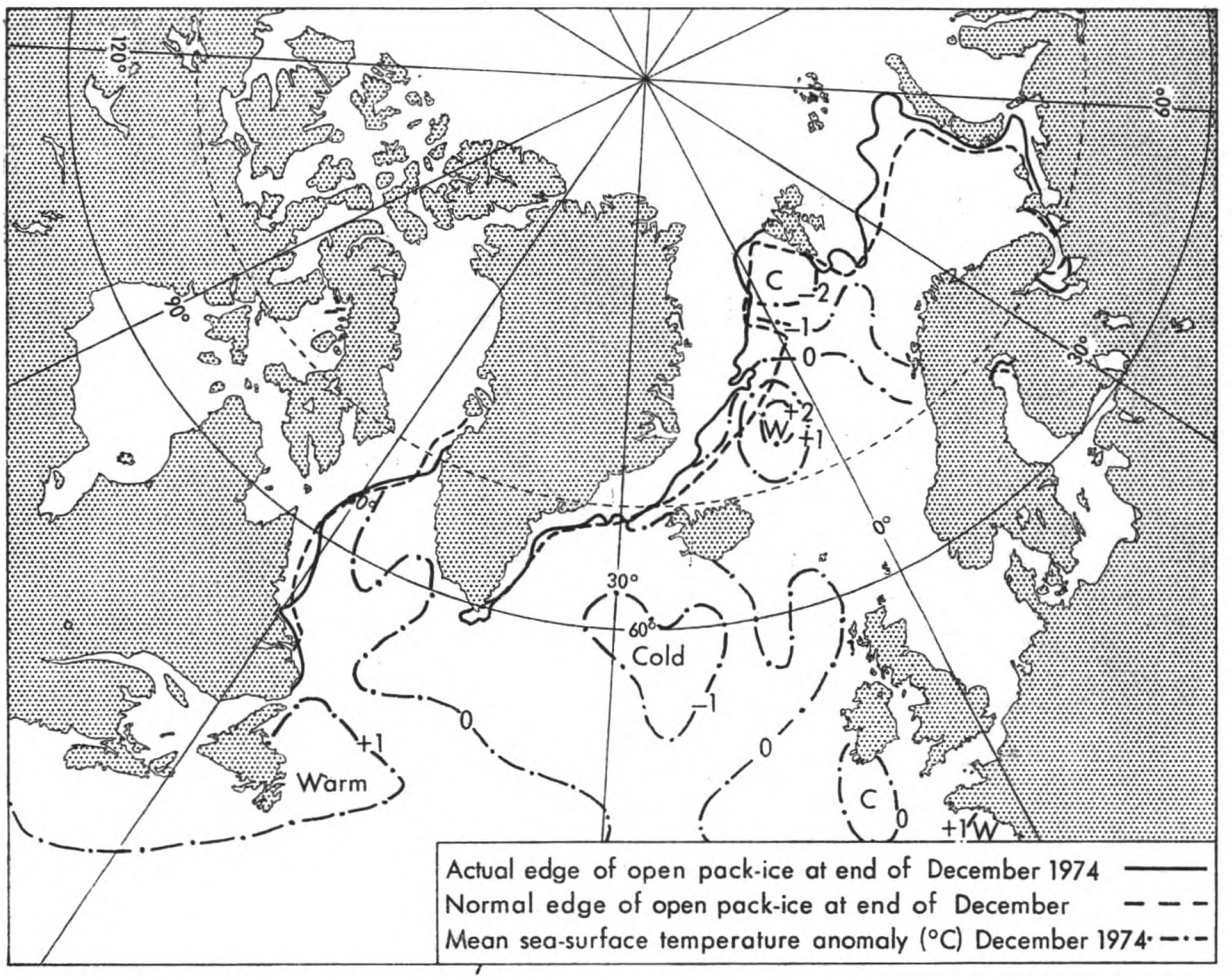
1. Washington, D.C., U.S. Navy Hydrographic Office. Oceanographic atlas of the Polar Seas. H.O. Pubn. No. 705, Part II: Arctic, 1958.
2. Washington, D.C., U.S. Naval Oceanographic Office. Oceanographic atlas of the North Atlantic Ocean. Pubn. No. 700, Section III: Ice, 1968.
3. London, Meteorological Office. Various publications.
4. Washington, D.C., U.S. Department of Commerce Weather Bureau. World weather records, 1951–60. Vol. 1: North America, 1965.
5. London, Meteorological Office. Monthly meteorological charts and sea surface current charts of the Greenland and Barents Seas. Met.O.575, 1966.
6. Washington, D.C., U.S. Naval Oceanographic Office. Oceanographic atlas of the North Atlantic Ocean. Pubn. No. 700, Section II: Physical Properties, 1967.

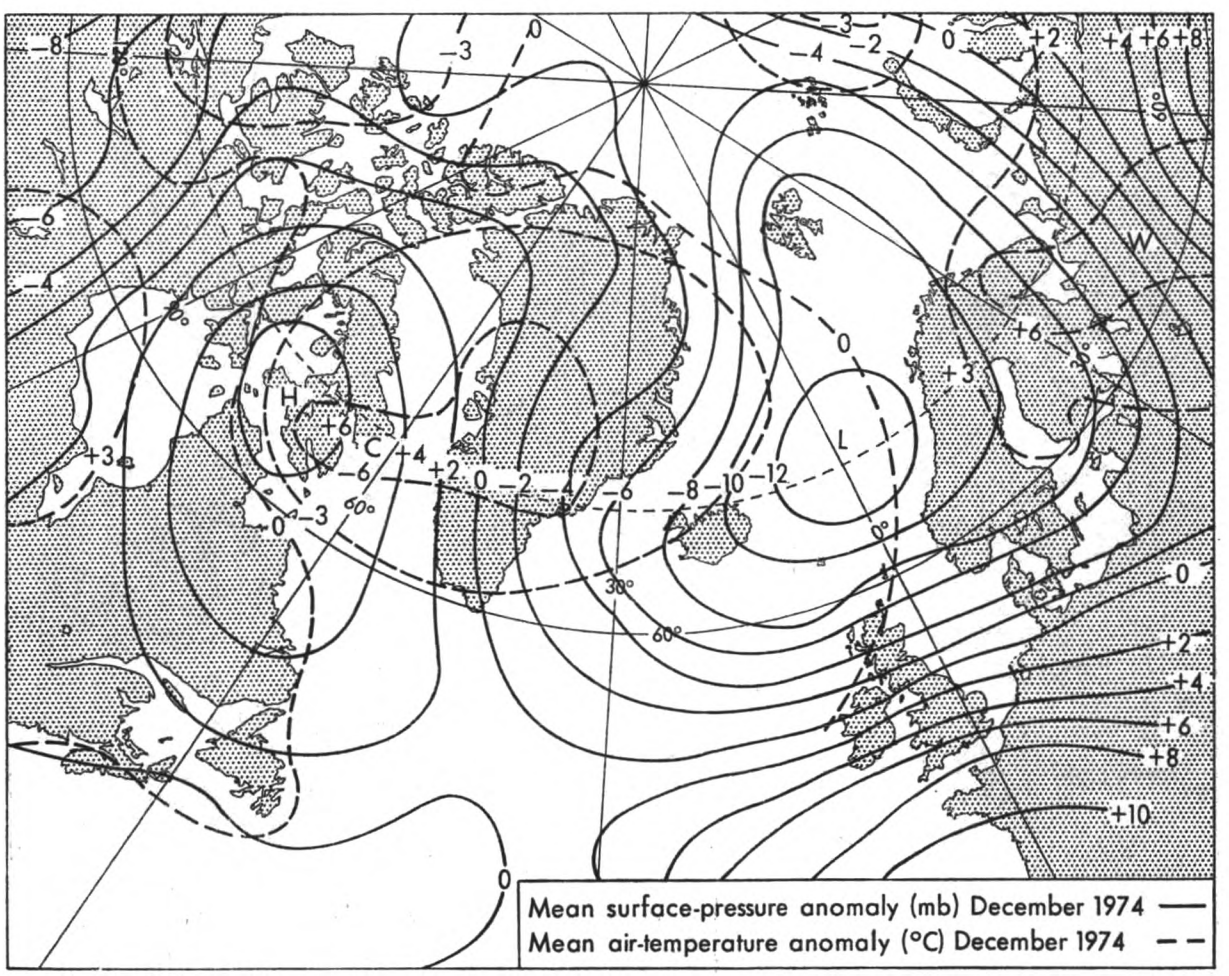

Cold
Cold
Warm
Actual edge of open pack-ice at end of October 1974
Normal edge of open pack-ice at end of October
Mean sea-surface temperature anomaly (°C) October 1974


High
Cold
Warm
Low
Cold
Low
High
Mean surface-pressure anomaly (mb) October 1974
Mean air-temperature anomaly (°C) October 1974


120°
60°
90°
30°
Warm
+1
0
+2
+1
0
Cold
−1
0
30°
60°
C
−1
W
+2
+1
0
0
0
+1
Actual edge of open pack-ice at end of November 1974
Normal edge of open pack-ice at end of November
Mean sea-surface temperature anomaly (°C) November 1974


120°
60°
30°
0°
−2
+2
−4
0
−2
0
Warm
+2
High
+2
Cold
−2
0
+2
W
0
−2
−4
−6
Low
−4
−2
0
High
+8
−8
−6
−4
−2
0
+6
+4
+2
0
Warm
+2
0
0
Mean surface-pressure anomaly (mb) November 1974
Mean air-temperature anomaly (°C) November 1974


120°
90°
60°
30°
0°
C
W
Cold
Warm
Actual edge of open pack-ice at end of December 1974
Normal edge of open pack-ice at end of December
Mean sea-surface temperature anomaly (°C) December 1974


H
C
L
W
Mean surface-pressure anomaly (mb) December 1974
Mean air-temperature anomaly (°C) December 1974

Baltic Ice Summary: October–December 1974

No ice was reported at the following stations during the period: Leningrad, Riga, Pyarnu, Viborg, Klaipeda, Ventspils, Tallin, Helsinki, Mariehamn, Turku, Vaasa, Bredskar, Sundsvall, Stockholm, 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 and November.

Station	December								
	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days
	A	B	C	D	E	F	G	H	I
Oulu ..	18	31	12	2	4	11	0	0	—
Roytaa ..	30	31	2	0	0	2	0	0	—
Lulea ..	2	31	30	20	0	2	29	0	291
Skelleftea ..	29	31	2	0	0	0	0	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.

Book Reviews

Sea and Air, by Jerome Williams, John J. Higginson and John D. Rohrbough. 248 mm × 190 mm, pp. 360, *illus.* Patrick Stephens Ltd., Bar Hill, Cambridge, CB3 8EL, 1973 (2nd Edition). Price: £6·00.

Sea and Air was initially written for use in an introductory course given to all midshipmen at the U.S. Naval Academy at Annapolis, and is an attempt to bring into a single volume a great deal of basic information on chemical, geological, biological, but primarily physical aspects of the ocean and atmosphere relevant to all who go to sea or need to know something about the marine environment.

As a reference book it is largely successful. Many scientific and technical terms are explained from isobar to syzygy, from bathythermograph to psychrometer. Clouds, winds, waves, currents, heat, light and sound are some of the subjects described, albeit briefly and in some cases superficially. I notice a few surprising omissions, for example Lee waves, but the coverage is reasonably thorough.

As a text book, from which to gain a basic understanding of the physics of the sea and air, I am less happy about the book. A very uneven background knowledge is assumed of the reader, possibly reflecting the styles of the three authors, one of whom is an academic, the others a surface officer and a naval aviator. For example, in Chapter 9, vectors and vector addition are described at an elementary level suitable for a person who has never heard of a vector before. Yet, in Chapter 8, one must be acquainted with both integration and natural logarithms to follow the derivation of Lambert's Law.

Nor do I find the explanations always satisfactory. Firing a gun from the North Pole is given as the familiar illustration of the Coriolis force, followed by the statement, "it may similarly be shown that a projectile fired from the equator toward the North Pole would again undergo a deflection to the right." The student is not warned that the equator is moving under the rotation of the earth while the pole is not, nor is the angular momentum mentioned. When the authors do introduce angular momentum later, in discussing wind systems, it is not satisfactorily described, nor is it made clear why it should need to be conserved. Surely the illustration of the ice skater could have been given. There are other omissions, the most

important being in Chapter 2, where the findings that have revolutionized geological understanding of 'continental drift' over the past few years have not been mentioned.

The layout of the book could be improved. A chapter on 'Life in the Sea' is placed haphazardly in the middle of the physical section of the book. Elementary information on waves is duplicated in the chapters on 'light and sound' and 'wind waves'. 'Condensation and precipitation' is in Chapter 15, but 'water, the common denominator' is in Chapter 3. The final chapter, 'Epilogue' reads like the afterthought it is.

But I do not wish to appear too negative. The non-physicist may be frustrated by a number of sections, but all readers will pick up a good deal of useful information by browsing through *Sea and Air*. It is a book worth having on one's reference shelves.

R. T. P.

Ice with Everything, by H. W. Tilman. 222 mm × 145 mm, pp. 142, *illus*. Nautical Publishing Co. Ltd., Nautical House, Lymington, Hampshire, SO4 9BA. Price: £2·75.

Most readers of this journal will be familiar with the name Bill Tilman, a man who sails long distances in small boats in order to climb rugged mountains. A number of such journeys, in both hemispheres, were made in *Mischief*, a Bristol Channel Pilot cutter of some 50 feet in length. This famous cutter sank when under tow across the Norwegian Sea following a stranding at Jan Mayen. *Mischief* was replaced by *Seabreeze*, an almost identical Pilot cutter.

This book tells the story of annual voyages into the Arctic in *Seabreeze* and her successor *Baroque*, during the period 1971 to 1973.

For some considerable time the author's goal has been to sail into Scoresby Sound, a magnificent, isolated fjord on the east coast of Greenland, well within the Arctic Circle. *Seabreeze* left Lymington early in June 1971 bound for this destination, sailing east about through the Dover Straits and Pentland Firth and, after calling at the Faeroes, she arrived at Reykjavik on 17th July. The propeller and shaft were replaced in Iceland before leaving there at the end of July. Unfortunately, 1971 turned out to be a particularly bad year for pack ice in the Greenland Sea and *Seabreeze* was unable to make a closer approach than about 60 miles to the entrance to Scoresby Sound. However, the object was to climb mountains in Greenland so a course was laid for Angmagssalik, some 500 miles further south-west. Having achieved the object in this region, *Seabreeze* left Greenland waters early in September and arrived at Lymington towards the end of the month.

After some reflection on the almost insurmountable difficulties of reaching Scoresby Sound, the destination for the following year was changed to Ellesmere Island in the north of Baffin Bay—only slightly less inaccessible for a small boat than Scoresby Sound. An insight into the author's attitude towards these difficulties can be obtained from his own conclusion: "Anyway, why start for a place that is almost certain to be reached?"

Seabreeze set sail from Lymington at the end of May 1972 but had to divert to Reykjavik to replace a broken spar. She left Iceland around mid-July and, as it was then too late to reach Ellesmere Island, it was decided to make yet another attempt to reach Scoresby Sound. The cutter arrived off Scoresby Sound early in August but, while standing-off to await the clearance of a relatively narrow belt of ice, the engine became unserviceable. As it would have been foolhardy to have attempted to navigate through broken ice conditions into Scoresby Sound without the support of the engine, this goal was abandoned yet again and *Seabreeze* sailed for Angmagssalik. On the 21st August, in attempting to seek shelter in a fjord close to Angmagssalik, *Seabreeze* foundered on skerries close to the entrance. Though the crew were saved, they were unable to salvage much from the wreck to support their own survival. However, they were spotted next day by a passing Greenland vessel

and eventually returned by air to England. The author later considered salvaging *Seabreeze* but aircraft reports indicated that she had slipped into deep water.

Yet another Pilot cutter, *Baroque*, again built around the turn of the century, was purchased and fitted out in Cornwall during the following winter. *Baroque* sailed for Ellesmere Island towards the end of May 1973. As a considerable time had to be spent in Ireland carrying out repairs to the chain-plates, Ellesmere Island was abandoned in favour of Umanak Fjord on the west coast of Greenland. She left Bantry Bay towards the end of June and arrived at Umanak in mid-August, where some time was spent in mountaineering, an object of the voyage. *Baroque* left the area before the end of August and, after an adventurous return voyage, culminating in beating against easterly winds in the Channel for about a week, she arrived at Lymington on 7th October.

Such voyages, undertaken in old boats, are fraught with difficulties. Each one has been accompanied by engine trouble, broken spars (a failing of Pilot cutters) and crew difficulties, to say nothing of the inherent hazards associated with navigating stormy, ice-infested seas in high latitudes. Some difficulties are completely unforeseen, such as poorly-marked salmon nets in the Davis Strait which caused *Baroque* more problems than the icebergs of this region.

The book is written in the author's inimitable style, amusingly punctuated by anecdote and quotation as well as descriptions of life aboard in mid-ocean. For those who have been fortunate enough to read Bill Tilman's earlier books, this is another classic which must not be missed; for those who have not, here is a chance to meet an author whose books make compulsive reading.

R. M. S.

Personalities

RETIREMENT.—Captain G. V. Barnes has retired from active service after 47 years at sea, 28 of which were spent with the Bristol Steam Navigation Company.

George Victor Barnes was born in Sunderland in 1911 and, having decided on a nautical career, was indentured to B. J. Sutherland & Co. as a navigating apprentice in 1927. He obtained his Second Mate's Certificate in 1931 but, due to the depression in the thirties, he was unable to obtain an appointment until the end of 1932 when he was appointed Third Officer in one of Sutherland's ships. Having successfully gained his First Mate's Certificate, Captain Barnes resumed his career with the Consett Iron Company. In 1939 he joined Billmeir & Co. in whose ships he saw the outbreak of World War II, sailing in the first North Atlantic convoys. In 1940, in order to complete his sea time, Captain Barnes accepted a berth in the *Penhurst* for voyages to Portugal and the Mediterranean.

The close of 1940 saw Captain Barnes sailing in the *City of Charleroy* of the Brussels Steamship Company, having obtained his Foreign-going Master's Certificate. He spent the remainder of the war in ships belonging to that Company, engaged mainly in the coal trade from ports in the north-east to the south coast of England. This entailed making frequent passages through the notorious 'E-boat Alley', where Captain Barnes saw plenty of action. On one occasion his ship, the *Greyfriars*, was credited with the destruction of an E-boat. Captain Barnes took the *City of Charleroy* to Normandy in 1944 for the invasion and afterwards she was the first Allied merchant ship to enter Dieppe and St. Malo when these ports were liberated. Captain Barnes considered himself very fortunate because he did not get his feet wet throughout the war.

After the war the *City of Charleroy* was chartered by the Bristol Steam Navigation Company and Captain Barnes commenced his long association with that Company, being appointed permanent Master. At the invitation of the Directors,

he assisted in the design of the *Apollo*, which was considered to be far in advance of her time when she was completed by Charles Hill, in Bristol, in 1954. Captain Barnes was in command of her on her maiden voyage and remained in her until his recent retirement. Originally she was employed between the Bristol Channel and Continental ports, but in 1969, having been lengthened, the *Apollo* began the Company's service between Bristol and Ireland in which she is still employed.

Captain Barnes, who is a member of the Honourable Company of Master Mariners, was appointed to the Younger Brethren of Kingston-upon-Hull Trinity House in 1960 and subsequently served as a Steward to the Board. He was appointed to the Assistant Elder Brethren in 1970 and, on his retirement from the sea, has been appointed to the Board of Trinity House. He will shortly be moving from Bristol to Hull to take up this appointment.

Captain Barnes' record of voluntary observing commenced in 1954, when the *Pluto* was recruited as a 'Marid' ship. At his request, the *Apollo* was recruited in 1954 as a 'Marid' and a year later she became a Supplementary Ship. In nineteen years of observing, Captain Barnes has sent us 24 logbooks, all of which have been classed as Excellent. He has received an Excellent Award each year from 1956 to 1974, with the exception of 1957 and 1970, a record which speaks for itself. This year he is one of the four shipmasters to be presented with a special long-service award (see page 82).

We wish Captain Barnes good health, happiness and every success in his new appointment in Hull.

D. J. F. S.

RETIREMENT.—CAPTAIN J. L. JENKINS has retired after 47 years at sea, the final 23 years of which were spent with the Bristol Steam Navigation Company.

John Lloyd Jenkins was born in the small Pembrokeshire port of Solva in 1912 and spent most of his school holidays sailing in the coastal schooners which plied between the Welsh ports in those days. He left school at the age of fifteen and went to sea 'before the mast', with his father who was Master in Walford Lines Ltd. A year later, he decided to go 'deep-sea' and he spent the next three years in ships belonging to Burdick & Cook of London and Chellew's of Cardiff. However, Lloyd Jenkins preferred the Home Trade and, as berths were scarce in 1931, he served once more under his father's command, in vessels belonging to Hugh Craig & Company of Belfast.

Captain Jenkins obtained his Master's Certificate of Competency in 1939, and took command of the *Quaysider*, owned by British Isles Coasters Ltd. He continued to serve in this Company's ships until 1944 when he joined Care Lines of Cardiff. Thus he spent the whole of World War II in and around the coasts of the British Isles and life during that period was extremely hectic and exciting, if not a little frightening.

In 1951 Care Lines sold Captain Jenkin's ship, the *Porthmeor*, to the Bristol Steam Navigation Company, and this began Captain Jenkins' long and happy association with that Company. He served in several of the Company's ships and then, in 1959, he was appointed to the *Echo*. He remained in command of her until his retirement in December 1974. Originally she was engaged in the Company's Bristol Channel to the Continent trade. In 1969, the *Echo* was lengthened and transferred to the Company's container and unit-load service between Avonmouth, Cork and Dublin, in which she is still employed.

Captain Jenkins' record of voluntary observing began in 1954 when he was appointed Master of the *Cato*, a 'Marid' ship. In 1956 he joined the *Milo*, a Supplementary Ship, and his first logbook was subsequently received in the Marine Division. In nineteen years of observing, Captain Jenkins has sent us 23 logbooks,

21 of which were classed as Excellent. He has received an Excellent Award each year since 1960, with the exception of 1965 and 1970.

We wish Captain Jenkins good health and much happiness in his retirement.

D. J. F. S.

Notice to Marine Observers

PORT METEOROLOGICAL OFFICE, MIAMI, FLORIDA

Our attention has been called to the manning of a relatively new Port Meteorological Office in Miami, Florida. Its services are available to any vessel calling there which may be in need of assistance and is under the supervision of Mr. W. A. Sitartz, the Port Meteorological Officer. His address is:

Port Meteorological Officer,
NOAA, National Weather Service,
Atlantic Oceanographic and Meteorological Laboratories,
15 Rickenbacker Causeway, Virginia Key,
Miami, Florida 33149. Telephone (305) 361–3361.

Printed in England for Her Majesty's Stationery Office by
William Clowes & Sons Limited, London, Beccles and Colchester

Dd. 506685 K20 4/75

ISBN 0 11 723006 5