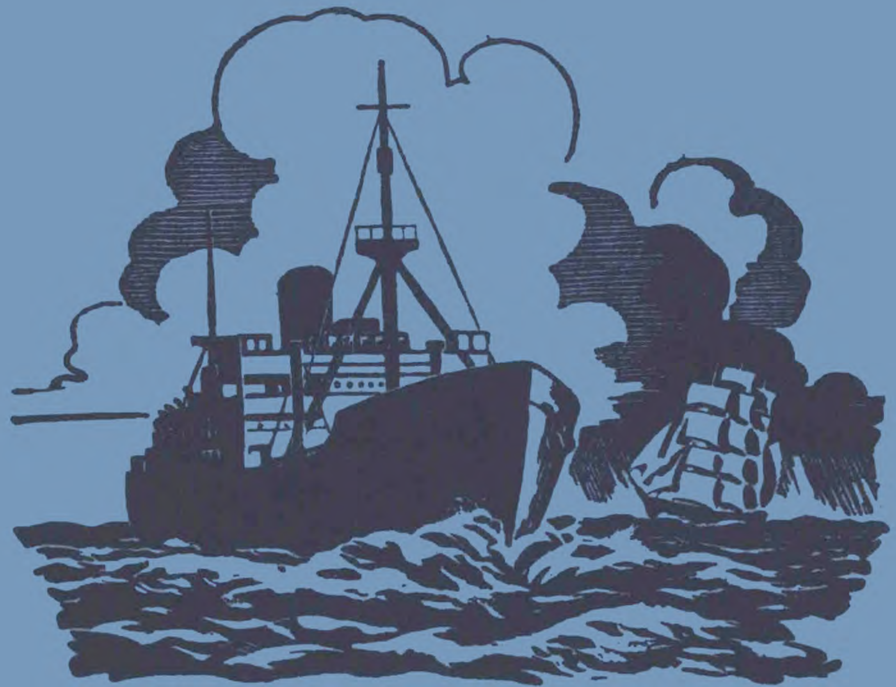
Met. O. 914

The Marine Observer

A quarterly journal of Maritime Meteorology



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THE MARINE OBSERVER

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

VOL. XLVIII **No. 260** **APRIL 1978**

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Report of Work for 1977

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

1. Voluntary Observing Ships

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

(*a*) 515 Selected Ships, including 7 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*) 38 Supplementary Ships, including 8 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*) 57 coasting ('Marid') vessels which make sea-surface temperature observations in UK 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*) 12 Light-vessels and 1 light-tower which make observations of wind, waves, visibility, air and sea temperatures; all of these send coded reports by R/T. Reports from the Royal Sovereign light-tower and the *Noord Hinder*, *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*) 7 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 UK, Canada, Iceland, Norway or USSR depending on the area in which they are fishing.

(*f*) 6 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 maintaining the strength of the Fleet rests on the seven Port Meteorological Officers at Glasgow, Liverpool, Hull, Tyne, Cardiff, Southampton and London. These Officers 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 continued to increase because the majority of vessels now 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 and research vessels, 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. The policy of appointing Port Meteorological Officers who are Master Mariners with considerable experience as voluntary observers at sea, contributes significantly to the high standard of observations received from the officers of UK shipping. 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.

Table 1. Average number of British Selected and Supplementary Ships on main trade routes to and from the UK

Europe	40	West Indies	22
Australasia	49	South America	16
Far East	59	Pacific Coast of North America	7
Persian Gulf	38	Falkland Islands and Antarctic	2
South Africa	22	World-wide 'tramping'	173
West Africa	14	Near and distant-water fishing grounds	15
North Atlantic	53		

Acknowledgement should once again be made of the valuable service rendered by many Commonwealth and foreign Port Meteorological Officers for their services in the replacement of defective instruments in UK Selected Ships on protracted voyages, and the withdrawal of instruments from British ships which have been sold abroad to foreign interests. The timely intervention of the foreign Port Meteorological Officers has been of immense assistance to us as the number of vessels ending their British sea-going career in ports abroad has continued to increase.

During two typical five-day periods, one in June and one in November, the average daily number of reports from ships received in the Central Forecasting Office at Bracknell from various sources is shown in Table 2.

Table 2. Average daily number of reports received at Bracknell by various sources from ships during 1977

	JUNE	*NOVEMBER*
Direct reception from		
British ships in eastern North Atlantic	92	115
Foreign ships in eastern North Atlantic	100	89
British ships in North Sea	29	27
Foreign ships in North Sea	8	12
Ships in other waters	7	17
Total	236	260
Via other countries		
Ships in eastern North Atlantic	455	503
Ships in western North Atlantic	299	335
Ships in Mediterranean	59	60
Ships in North Sea	98	87
Ships in Arctic Ocean	66	53
Ships in North Pacific	749	821
Ships in other waters	313	281
Total	2039	2140

2. Ocean Weather Ships

The United Kingdom continued to operate two ocean weather ships within the North Atlantic Ocean Station scheme throughout the year although changes in operational ships were made. At the commencement of the year the *Weather Surveyor* and *Weather Reporter* were in service whilst the *Weather Adviser* and *Weather Monitor* were undergoing extensive refits and modernization programs in Manchester Dry Docks. The purpose of the refits was to extend the serviceable lives of the ships for a number of years and to improve the living and working conditions for those on board. As the ships are 33 years old and underwent a limited conversion 18 years ago, a vast amount of work was necessary endeavouring to raise the standards to those approaching modern ships of the same size.

The ships were completely rewired, the electrical generating systems being renewed and changed from direct to alternating current. The balloon shelters were raised to a higher deck and the use of hydrogen as a balloon gas was discontinued and a new helium system installed. The air-search radars used previously for upper wind finding was replaced by a NAVAID system making it possible to reduce the size of the ships' complements. A further saving in personnel was achieved by fitting automatic controls to the boilers. The reductions in crew made it possible, after stripping and refitting part of the accommodation, to provide single berth cabins for all adult members of the crew. Further improvements for crew comfort and entertainment included the fitting of completely new galleys and providing crew recreation rooms and video tape television in crew messes and the wardrooms. The opportunity was taken to strip the radio and transmitting cabins and to refit with new and more modern radio transmitters and receivers providing links between the ships, coast radio stations and the Bracknell Telecommunication Centre. Navigating bridges were removed and combined wheelhouse/chartrooms constructed and equipped with modern navigational aids and equipment. On the completion of satisfactory sea trials the ships were renamed OWS *Admiral FitzRoy* and OWS *Admiral Beaufort.*

Three Quays Marine Services, being the technical services division of the P. & O. Group, were employed as consultants throughout the refits and they provided most satisfactory guidance and technical assistance.

The *Admiral FitzRoy* (ex *Weather Adviser*) sailed on her first voyage under her new name on 17 March replacing the *Weather Surveyor*, and was followed by the *Admiral Beaufort* (ex *Weather Monitor*), sailing on 28 May, replacing the *Weather Reporter*, the oldest of the Castle Class Frigates. Ocean Station Lima was manned continuously throughout the year, there being no disruption due to the introduction into service of the refurbished weather ships.

The weather ships make hourly surface and six-hourly upper air observations. The following additional observations were made at regular intervals by the two British weather ships: sea temperature and salinity to considerable depths, collection of rain water for analysis by the International Atomic Energy Agency, magnetic variation, samples of sea water collected at monthly intervals for an International Atomic Energy/World Meteorological Organization tritium survey, sea water samples collected to and from station for monitoring radio-active content and reporting of floating pollutants for the Intergovernmental Oceanographic Commission/World Meteorological Organization pilot project on marine pollution monitoring. Sea and swell records were maintained throughout the year using the Tucker shipborne wave recorder.

3. Ship Routeing

A ship routeing service is provided to advise on North Atlantic and North Pacific passages and to offer advice in regard to the movement of tows. The object of the service for conventional vessels is to select the best route for a ship to follow in order to reach its destination in the shortest time with the least damage to hull and cargo and with the most economical fuel consumption. The vessel's response to various wave fields is determined by extracting sufficient data from the deck logbooks and a ship/wave performance curve is constructed. The ship routeing section has now amassed a considerable amount of ship performance information for various types of vessel and it is now possible to construct a wave/speed curve from basic ship size and type data without recourse to the deck logbooks. Wind and sea-wave predictions at intervals of 12 hours for up to 72 hours ahead are supplied to the ship-routeing officers by forecasters of the Central Forecasting Office and this information is used in conjunction with the performance curve to determine the most favourable course for the vessel to follow. Subjective consideration is given also to the loading state of the ship, to surface currents, navigational hazards such as shoals, ice and to areas of fog. Communication with the vessel is usually by telex prior to sailing and via predetermined coastal radio stations when the ship is on passage. The provision of routeing advice to tows which do not have too restrictive weather parameters is similar to that for conventional ships, but allowance has to be made for the slower speed of the tow and for their reduced manoeuvrability. For tows with limiting weather factors which may be wave height or period or amount of heel or wind force, the routeing service advises when and where to seek shelter and when to resume passage. During the year there has been an increase of 25 per cent in revenue from ship routeing activities.

4. Services for Marine Activities

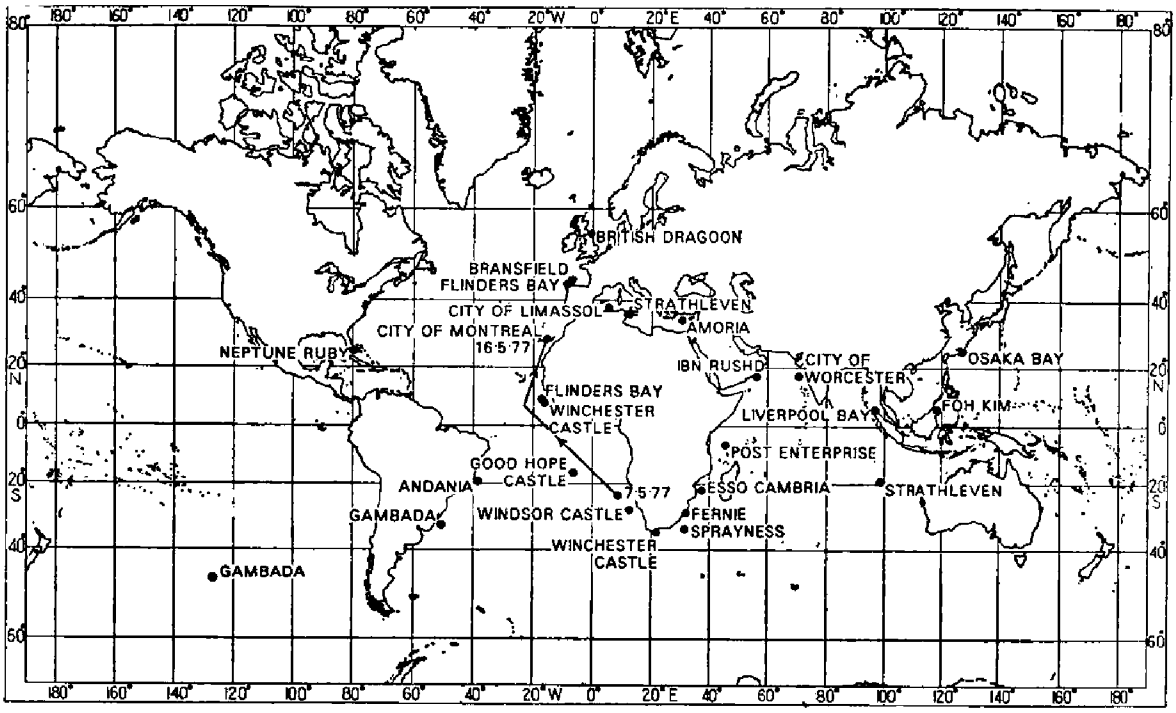
The general services to shipping via BBC Radio 2 and the Post Office coastal radio stations continued on the lines of previous years. The inshore waters forecasts were provided on Radio 3 and Radio 4 without major change. They have been supplemented by others from the growing number of BBC local radio stations which, during the sailing season, transmit forecasts designed for the local inshore sailors.

5. Inquiries

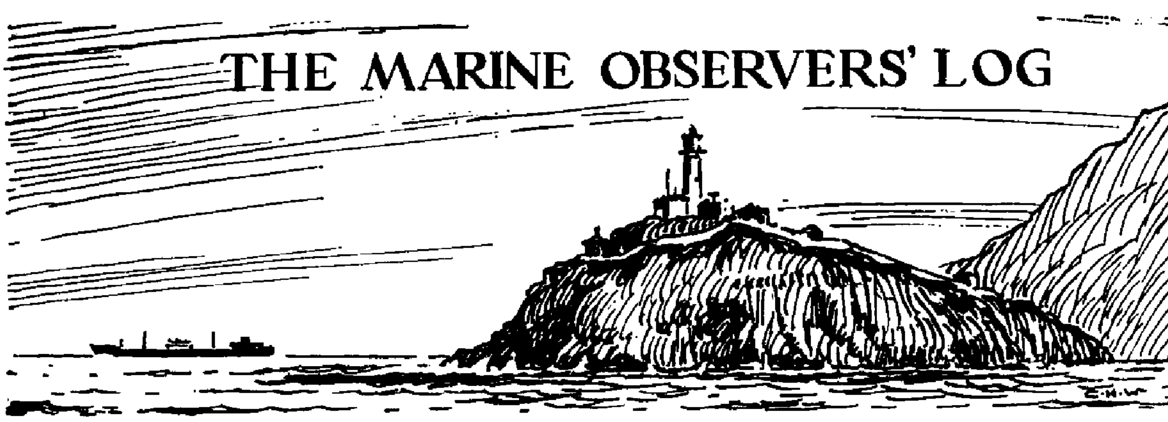
The number of marine inquiries, most of them from solicitors, shipping companies, universities and industrial firms, has continued to increase throughout the year and totalled in excess of 500. The subjects of inquiries are extremely varied.

6. Awards to Voluntary Observing Ships

The shipmasters, principal observing officers and radio officers who have been responsible for sending in the 100 best meteorological logbooks during the year were, as is customary, nominated for 'Excellent' awards. Barographs were presented to four shipmasters for their long and zealous meteorological work at sea. Awards were also made to Masters and Officers of vessels on the short sea trades for their contribution in making sea-temperature observations and to trawler skippers and radio officers who had the best records in making and sending non-instrumental observations from the fishing regions. The books selected for this year's awards were *The University Atlas*, *Cassell's English Dictionary* and *The Wayfarer's Guide to this Beautiful Britain*.



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



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 UK will supply bottles, preservative and instructions on request.

LINE SQUALL AND MOTHS

Indian Ocean

m.v. *Spraynes*. Captain A. W. Ritchie. Cape Town to Melbourne. Observers, Mr P. Bagley, Chief Officer and Mr I. Taylor, 2nd Officer.

17 April 1977. At 0330 GMT a line squall running in a NW–SE'ly direction was observed on the radar screen; ten minutes later the vessel entered the squall.

The rain, which was only light at first, became very heavy at 0410 and at about the same time the vessel was invaded by literally hundreds of small moths.

After a short while the rain eased and only a few moths remained with the vessel. Shortly afterwards, however, the rain became heavy again, this time it was accompanied by thunder and lightning, and once again the moths returned in large numbers.

The moths remained with us until 0505 by which time the vessel was clearing the squall. The squall was still observed to be running in a NW–SE'ly direction across the radar screen on the 24-n. mile range.

Half an hour later continuous moderate rain was still falling around the vessel. The line squall was observed to be astern but bulging out and following the vessel. Vivid forked lightning and thunder were observed to the south.

At 0600 the vessel was completely clear of the squall.

Position of ship at 0330: 34° 00'S, 32° 00'E (approx.)

WATERSPOUTS

South Atlantic Ocean

m.v. *Andania*. Captain J. K. Cooper. Rio de Janeiro to Hamburg. Observers, the Master, Mr P. Baker, 2nd Officer and Mr D. Knight, 3rd Officer.

2 April 1977. At 1400 GMT the vessel was observed to be heading towards a belt of rain to the north, and, as part of the vessel was being painted, course was altered to avoid the rain.

About 15 minutes later three waterspouts were observed. Unfortunately the vessel did not avoid all the rain and when we emerged from the shower the waterspouts had dissipated. They were, however, clearly observed before the shower was encountered. The central waterspout was the largest and the first to be formed. At first there appeared to be a disturbance on the water, this resulted in what appeared to be water vapour rising from the sea surface. The upper part of the waterspout was then observed to form and increase in diameter, this then began to lengthen. It was at this point that the other two waterspouts were observed. Before we were able to assess the direction of rotation, we had entered the rain.

Weather conditions were as follows: Wind WNW, force 4, dry bulb 28°C, wet bulb 26, barometric pressure 1014·1 mb, towering cumulus base 800 feet.

Position of ship: 19° 22'S, 38° 35'W.

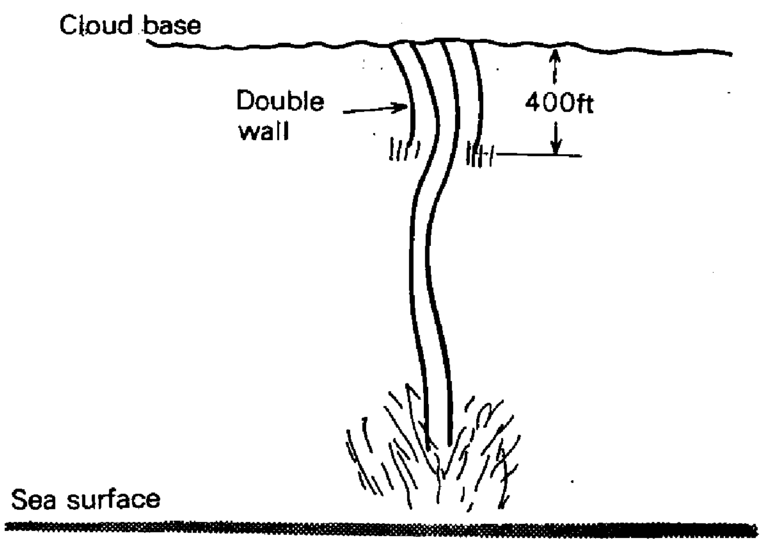
Moçambique Channel

s.s. *Esso Cambria*. Captain I. Grigor. Arabian Gulf to Rotterdam. Observers, the Master, Mr C. G. Starr, 2nd Officer and Mr I. F. Davies, Radio Officer.

23 May 1977. At 1030 GMT a heavy rain shower was observed to starboard moving in a NE'ly direction. When the shower was three n. mile from the vessel, a disturbance was noticed about half a nautical mile to the east of the heavy rain; shortly afterwards a waterspout was observed in this position. The cloud base from which the waterspout formed was estimated to be 2000 feet. The spout occasionally bent to an angle of about 15 degrees from the vertical.

After passing the vessel a 'double wall' began to form around the waterspout from the base of the cumulonimbus cloud and extend downwards for a distance of about 400 feet, see sketch.

The waterspout was observed for a period of 45 minutes and the 'double wall' for 15 minutes.



Weather conditions at the time of the observation were as follows: dry bulb 26·2°C, wet bulb 22·5, sea temp. 26·8, barometric pressure 1018·0 mb, wind SW, force 4.

Position of ship: 21° 44′S, 37° 32′E.

LIGHTNING DISPLAY

South African waters

m.v. *Fernie*. Captain E. D. Stewart. At anchor, Richards Bay. Observer, Mr A. Verghese, 2nd Officer and Mr D. W. Clark, 3rd Officer.

13 May 1977. An unusually long lightning display was observed. It was thought to have started about 1900 GMT and although it had decreased in flash-frequency by 2345—before this time it had been almost continuous—it was still visible and fairly active almost until sunrise.

An echo was observed on a bearing of 135–160°T on the 96-mile range of the 10 cm radar at between 48 and 68 n. mile and extending in a SE–NW direction being approximately 40 miles long and 10 miles wide; it was observed to be moving slowly SE. The echo was continuously observed on the radar screen even though the vessel was rolling 2–3 degrees and the echo was on the starboard beam.

Once or twice during the display forked lightning was seen to 'arc' from cloud top to cloud top. It was also seen to 'snake' through the cloud.

By 2345, although there were larger gaps between the flashes, rarely did one second pass without at least one flash.

Weather conditions were as follows:

At 2200: wind NNW, force 2, dry bulb 20·9°C, wet bulb 18·7, sea temp. 23·1, barometric pressure 1010·0 mb.

At 0200: wind E, force 2, dry bulb 19·5°C, wet bulb 18·5, barometric pressure 1010·5 mb.

During the whole of the period there was a steady rise in barometric pressure.

Position of ship: 28° 49′S, 32° 09′E.

DISTURBED WATER AND FLYING FISH

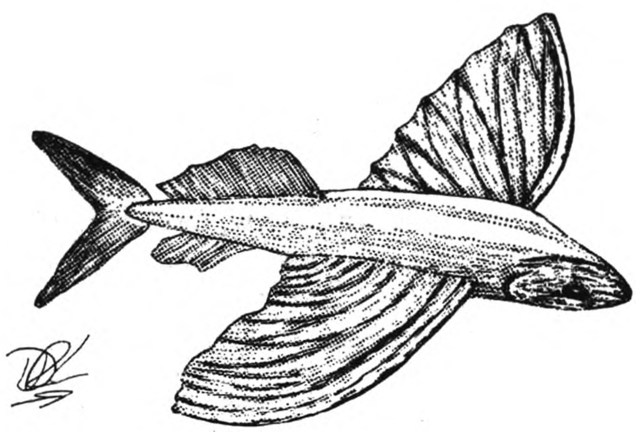
Eastern North Atlantic

s.s. *Flinders Bay*. Captain K. E. Howard. Rotterdam to Fremantle. Observers, Mr D. R. Lewis, 3rd Officer and Mr K. Cross.

23 April 1977. The vessel had been passing over a bank with a depth of 40 fathoms below the keel and as we passed over the edge of the bank, the bottom began to slope away and the sea surface became streaked. With a depth of 180 fathoms below the keel the streaks were quite distinctive, giving the appearance normally associated with a force 4 wind although the wind was in fact only about force 2.

The streaks ran in an east to west direction and were about 300 metres wide.

A large number of flying fish, see sketch, rose as the vessel entered this area, this was probably a coincidence.



The echo sounder gave a steady slope downwards with no unusual sea-bed configuration.

Position of ship at 1030 GMT: 9° 27′N, 16° 21′W.

RADAR ECHOES

Mediterranean Sea

m.v. *Amoria*. Captain D. Cooper. Larnaca (Cyprus) to Marsaxlokk (Malta). Observer, Mr G. J. Barber, 3rd Officer.

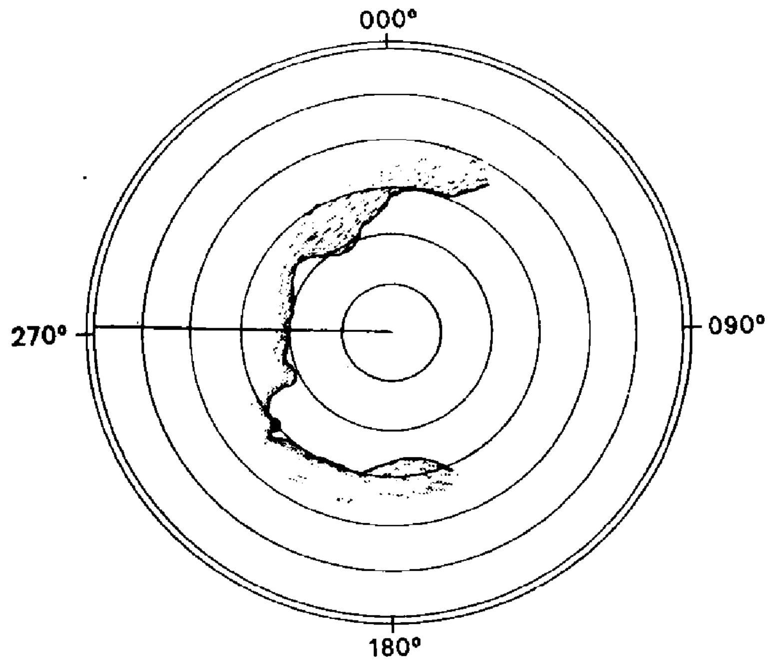
26 June 1977. During the morning unusual echoes were observed on the radar screens; one radar was set on the 12-n. mile range and the other on the 24-n. mile range. An observed position had been obtained at 0218 GMT and the sun rose at 0228.

At 0230 echoes were observed on the radar screens similar to those obtained from rain. During the hour that followed the echoes increased in intensity and clarity until they formed a coastline-shaped appearance to the north, west and south of the vessel at approximately 8 n. mile distant. The sketch shows the echoes as observed on the screen on the 24-n. mile range. It were as though the vessel was positioned at the centre of a bay some 12–16 n. mile across.

The echoes were observed with no significant changes in intensity or shape for about an hour. At approximately 0400 the southern and western echoes began to disappear and by 0430 the radar screens were clear again.

The nearest land to us was Cyprus about 65-n. mile to the north-east.

Weather details at the time of the observation were as follows: sky clear, visibility



about 6 n. mile, air temperature 24°C, wind WNW, force 3–4. The vessel was steering a course of 271°T.

Position of ship at 0600: 34° 30′N, 30° 24′E.

Note. Mr A. H. Shaw of the Royal Signals and Radar Establishment, comments:

'It seems the effects may well be due to some form of anomalous propogation as the patterns seem to be centred on the ship rather than forming a line or other pattern at a different position. One possibility is sea clutter but this would need some reasonable wind speed.

'Since the effects are of short duration and occur around dawn, they may be associated with a surface duct of high refractive index which rapidly dispersed.

'Whilst it is conceivable that dust or sand are responsible, it is difficult to explain the shape of the echoes.'

SHARK

South Atlantic Ocean

m.v. *Good Hope Castle.* Captain W. J. Howson. At anchor James Bay, St Helena. Observers, Mr I. M. Ward, 3rd Officer and ship's company.

3 April 1977. Whilst at anchor in James Bay, what was at first thought to be a whale was observed cruising slowly up and down just below the surface between the ship and the shore. The depth of the water in this area was about 22 metres.

The local stevedores told us that this was a 'Bone Shark', a term unheard of by any of the ship's company before, and enquiries of passengers and two of the ship's company who were local inhabitants, produced no further clue as to its identity.

The 'shark' was 7–8 metres in length, grey/black in colour and liberally covered with barnacles, which were so dense in places that they appeared similar to the patches of white pigmentation on killer whales. During the time it was observed (15–20 minutes) it was not seen to blow.

One of the passengers did say that the 'shark' was quite a character. Its normal haunt was further down the coast near Egg Island. Its favourite trick was to rise up suddenly alongside fishing boats and rub itself against the side, presumably trying to rid itself of some of the barnacles. When this happened the fishermen would push against the creature with their oars to prevent the boat from capsizing.

Position of ship: 15° 55′S, 05° 44′W.

PORPOISES

East China Sea

s.s. *Osaka Bay*. Captain D. T. Maclachlan. Suez to Tokyo. Observers, the Master, Mr M. Fowler, Chief Engineer and Mrs Fowler.

28 June 1977. A large school of porpoises joined and escorted the vessel for about five minutes. They took station in groups of three just forward of the bulbous bow and performed 'aquabatics' for about 30 seconds before 'peeling off' to allow another group of three to take over. Mrs Fowler likened the display to that given by the 'Red Arrows'.

The porpoises were about 1½ metres long. They had no difficulty in keeping up with the vessel whose speed was about 26 knots.

It was believed that porpoises were reluctant to approach high-powered turbine ships and one theory put forward was that the noise of the turbine gearing disturbed them.

Captain Maclachlan comments:

'I have noticed that during the past few years this shyness has gradually disappeared.

'The noise of the engines has not changed so perhaps initially the porpoise had some other cause for distrusting this class of vessel.

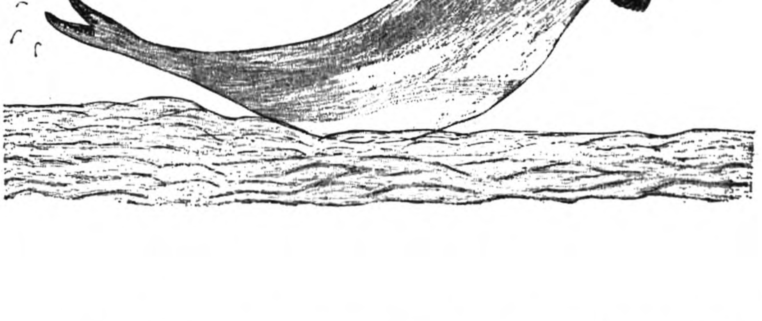
'Whatever the reason, these intelligent and friendly creatures now seem to have accepted the fact that we are just as harmless as conventional ships.'

Position of ship at 0600 GMT: 25° 18′N, 127° 00′E.

South Atlantic Ocean

s.s. *Windsor Castle*. Captain P. St Q. Beadon. Cape Town to Las Palmas. Observers, Captain A. Wigham (Staff Commander), Mr D. Reid, 2nd Officer, Mr K. Davie, 4th Officer and members of the ship's company.

13 April 1977. At 1400 GMT a large seal-like creature, see sketch, was sighted about 250 metres off the port bow. It was swimming with a splashing motion in a direction of 320°T.



The creature measured about six metres in length and was dark in colour with light patches on the flanks and under parts of the body. It had a short thin neck and a small head in comparison to its bulky body. It also had a sharp snout rather like a beak and, it was thought, possibly whiskers. The overall appearance was that of a walrus but without tusks. It was also thought, although not confirmed by all observers, to have had a blow-hole at the back of the head.

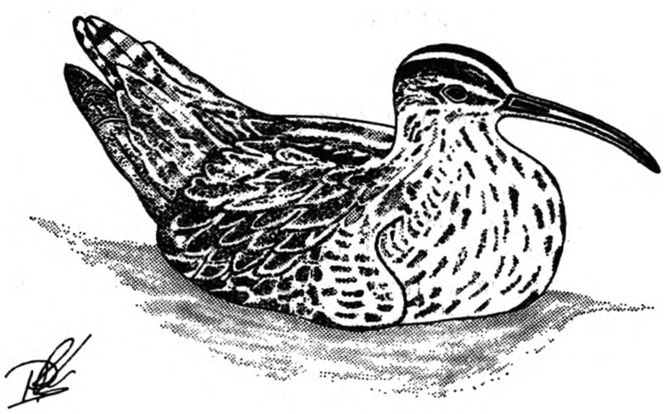
Position of ship: 28° 45′S, 12° 40′E.

BIRDS

Bay of Biscay

s.s. *Flinders Bay*. Captain K. E. Howard. Rotterdam to Fremantle. Observers, the Master, Mr D. R. Lewis, 3rd Officer and Mr K. Cross.

19 April 1977. At 0900 GMT a whimbrel, see sketch, landed on the roof of a container stowed forward of the bridge. It landed into the wind and steadied itself against the motion of the vessel. The vessel was heading southbound across the Bay of Biscay approximately 46 n. mile to the north of the Spanish coast.



The Master thought the bird may have been catching a lift back into warmer parts as the weather had become very cool when it came aboard.

The bird eventually flew off at 1430 and headed for the Spanish coast.

Position of ship at 0900: 44° 22′N, 8° 37′W.

Note. Captain G. S. Tuck comments:

'An excellent sketch of the Whimbrel *numenius phaeopus*. At this time of the year the whimbrel is usually migrating northwards.'

Florida Straits

m.v. *Neptune Ruby*. Captain T. J. Bearder. Cork to Vera Cruz (Mexico). Observers, the Master, Mr Chew Kwok Tim, Chief Officer, Mr R. Zainol, 2nd Officer and Mr S. K. Julian, 3rd Officer.

2 May 1977. Whilst the vessel was off Miami, Florida, five white egrets, of a type unknown to us, arrived and made themselves comfortable on board.

They showed little fear of men and seemed to enjoy standing about in pools of water; as it became warmer we sometimes washed down the bridge deck to indulge this fancy. When there were no pools of water they sat in line across the after 'goal-type' sampson posts.

Often they would fly alongside the vessel but were not observed to catch anything. They were not seen to eat for the whole of the three days they spent with us. They flew off upon our arrival at Vera Cruz after a voyage of 1000 n. mile.

We spent five days discharging at Vera Cruz and on our first day back at sea three egrets came on board. It was not possible to say for certain that these were from the five which had joined us earlier, but as they took the same roosting positions, it does seem likely that they were. Two days later they flew off and were not seen again.

Position of ship on 2 May: 25° 00′N, 80° 00′W (approx.)

Note 1. The *Neptune Ruby* is a Singapore Selected Ship.

Note 2. Captain G. S. Tuck, Chairman of the Royal Naval Birdwatching Society, comments: 'This is difficult to assess as the narrative gave no indication of size, but from the photograph it does appear to be a large bird. The fact that these birds appeared off Miami gives us an interesting clue.

'Roger Tory Peterson, in his book, writes that the largest American Heron—the Great White Heron *Ardea occidentalis* is the most restricted of any. Range—the extreme south of Florida (where the vessel was) and The Keys.

'Persecution in 1935 restricted them to about 150 species, but rigid protection has now increased their numbers to a more normal status. They inhabit coastal areas and are usually seen in shallow water well out from the mangroves.

'James Bond, in his book, also puts these birds off the coast of the Yucatan Peninsula not far from Vera Cruz.'

Arabian Sea

m.v. *City of Worcester*. Captain E. R. Finch. Karachi to Cochin (India). Observers, the Master, Mr T. Gwynne, 2nd Officer and Mrs Gwynne.

15 April 1977. At about 1120 GMT a bird was observed to land on No. 2 hatch cover. The ship at the time was about 100 n. mile south-west of Bombay. The bird soon gained the deck and began to run about in a quick business-like manner inspecting the foredeck. It gave every appearance of being fit and healthy. Eventually it settled down in the shade of a stack of dunnage.

The bird, see sketch by Mrs Gwynne, was about 18 centimetres in length and

about 15 centimetres tall. It had straight legs and a strong-looking black beak, white underparts and a greyish-brown mottled back with a black tail. The face and neck markings were striking having the appearance of a black mask around the eyes and a light orange or buff marking from the back of the head around to the breast but not meeting underneath. When the bird opened its wings they were seen to be white underneath and to be swept back like those of a tern. It was thought that the bird resembled a plover.

An egg sandwich and a saucer of water were placed on deck and after taking a piece of the egg, the bird flew off towards the land. It must, however, have returned during the night as it was sitting by No. 3 hatch next morning. As we were due to arrive at Cochin in a few hours we suspected it was waiting for a landfall.

Position of ship at 1120 on 15 April: 17° 10'N, 71° 10'E.

Note. Captain G. S. Tuck comments:

'This is a good sketch and description of a Greater Sandplover, *Charadrius leschenaultii.*'

Eastern South Atlantic

m.v. *City of Montreal.* Captain A. J. Palmer. Cape Town to Las Palmas. Observers, the Master and ship's company.

7 May 1977. Around mid-afternoon a racing pigeon landed on the fore-deck; it appeared to be very tired and we thought it had been caught in the gales off the Cape.

After a time it flew onto the starboard bridge wing, and, after consulting Major Lewis's article in the April 1975 edition of *The Marine Observer*, we offered, and the bird accepted, a feed of split peas and rice. Having eaten, it then slept on a rail in front of the wheel-house.

The next day the pigeon began a routine which it carried out until we arrived at Las Palmas. Every morning it would fly up to the forward mast table and spend some time cleaning itself. About midday it would fly aft onto the poop where it was fed by the crew with grain, split peas, groats and rice and a bowl of water. The bird was quite happy to walk around totally unperturbed by the presence of any of the ship's company.

The pigeon spent each afternoon sitting in the shade, then, just before sunset, it would fly around the ship performing aerobatics between the masts and giving a display of gliding that would have made any seagull envious. After the display it would settle on the rail in front of the wheel-house where it would sleep. It was thought that the bird preferred to sleep here because it knew that someone would be close by all the time.

Mr T. Haines, the Junior Engineer had kept pigeons and he thought that this was a 'Dark Checker'. He believed it was only a yearling since the green plumage on the breast was not fully grown. There was a ring on each leg, one rubber and the other aluminium, the aluminium ring carried the identification FCC 16.

The pigeon flew away during our stay in Las Palmas.

Position of ship at 1200 GMT on 7 May: 23° 18'S, 08° 45'E.

Position of ship at 1200 GMT on 16 May: 28° 10'N, 15° 28'W.

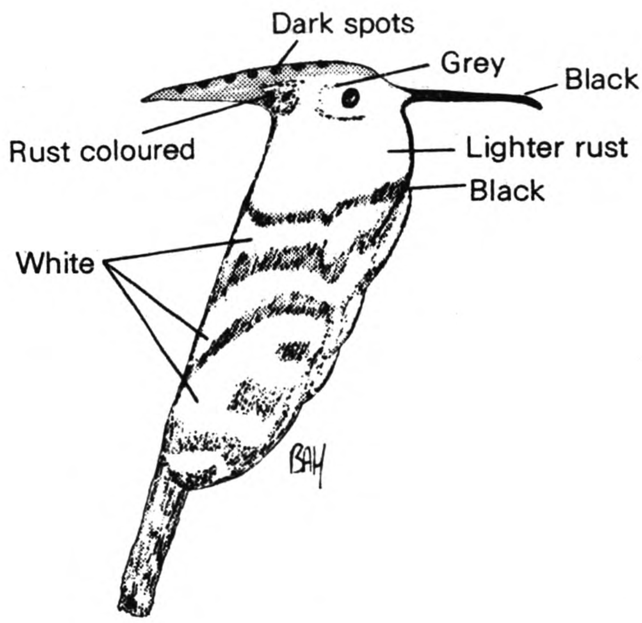
Mediterranean Sea

m.v. *City of Limassol.* Captain J. E. Wray. Haifa to Newhaven. Observer, Mr B. A. Hammett, 2nd Officer.

18 May 1977. The bird shown in the sketch was first observed to be resting on one of the derrick runner wires; after about ten minutes it flew off. Whilst in flight the bird opened its crest and the pattern of colours on the back were seen to be quite distinctive. The bird did not return and so it was not possible to obtain any further details.

It is hoped that this description and the sketch are sufficient to identify the bird.

Position of ship at 1200 GMT: 37° 30'N, 05° 24'E.



Note. This is the Hoopoe, *Upupa epops*, one of six species of the family Upupidae.

During the breeding season it is said to make a 'hoop poo poo' kind of noise. The crest is fanned during a courtship display and also when the bird is alarmed. The long bill is used to probe soil and refuse for its food which might be insects or worms or other small animal life.

It inhabits most of the European countries and occasionally nests in England where it may be seen in Spring and Autumn.

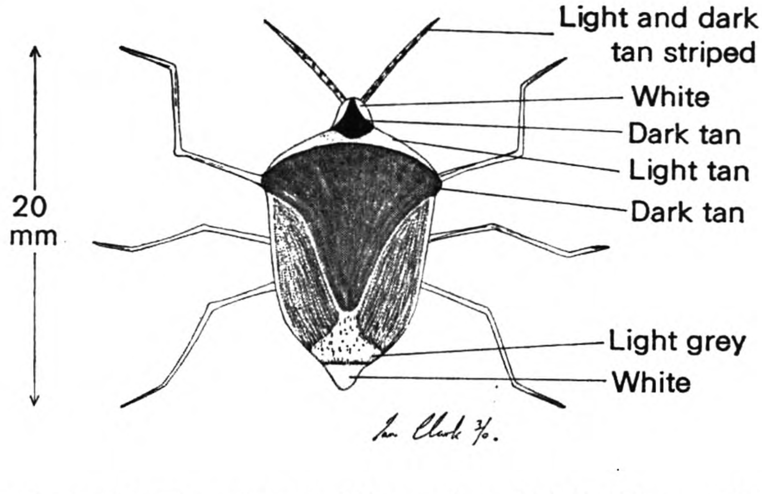
INSECTS

Bay of Biscay

R.R.S. *Bransfield.* Captain S. J. Lawrence. Montevideo to Southampton. Observer, Mr. I. Clark, 3rd Officer.

9 May 1977. At 1900 GMT the winged-insect as shown in the accompanying sketch was caught in the wheel-house.

Position of ship: 45° 08′N, 07° 50′W.



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

'The sketch is of a shieldbug (Hemiptera; Heteroptera, family Pentatomidae)—it may be the *Nezera viridula*—"the green vegetable bug".'

Indian Ocean

m.v. *Strathleven.* Captain D. J. Harrison. Tauranga (New Zealand) to Colombo. Observers, the Master and all Navigating Officers.

30 March 1977. Over a period of several days a number of small cricket-like insects were observed to alight on the vessel. They were dark brown, almost black, in colour and measured about 5 centimetres from head to wing tip. The body itself was about 2½ cm long but the wing extended from the body for another 2½ cm and came to a point at the end.

Protruding from the back of the abdomen were three spines about one centimetre long, two were symmetrical and pointing behind angled at about 30 degrees from the horizontal. The third was centrally placed on the top of the abdomen and extended upwards at about 20 degrees to the vertical. The antennae were about 2½ cm long and extended forward at an angle of about 45 degrees.

The back legs were estimated to be 3 cm long when extended, and had what appeared to be serrations on the lower sections.

Closer and more-accurate observations, or a specimen, were unobtainable as the insects jumped away when approached. None, however, were seen to fly or heard to 'chirp'.

Position of ship at 1200 GMT on 30 March: 19° 18′S, 99° 00′E.

Note 1. Mr B. C. Townsend of the Department of Entomology, British Museum (Natural History), comments:

'The insect you describe is a field cricket, probably one of the Australian *Teleogryllus* species, *T. commodus* Walker or *T. oceanicus* Le Guillou. Both are common in Australia and New Zealand.

'Your description is of a female. The central "spine" protruding from the end of the abdomen is the ovipositor used for depositing the eggs in the ground.

'In all crickets the female is mute, but the males of both the above-named species do stridulate.'

Note 2. Although this observation is dated 30 March 1977, it was decided to include it in this edition of *The Marine Observer* since it was considered to be of interest.

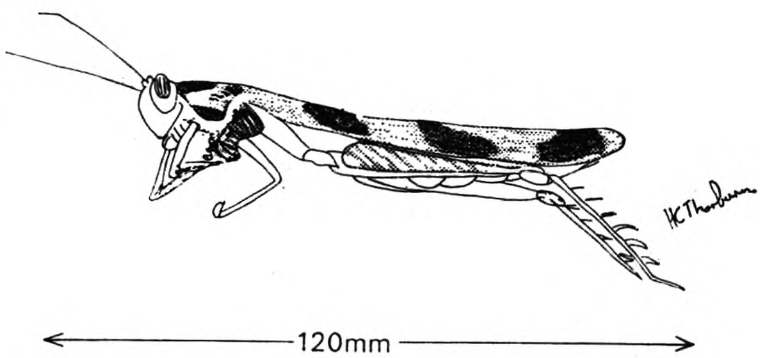
Arabian Sea

m.v. *Ibn Rushd.* Captain L. F. Lawrence. Suez to Kuwait. Observers, Mr N. Luck, Chief Officer and Mr P. J. Robinson, Radio Officer.

4 June 1977. The insect which landed on the vessel at 0200 GMT, and shown in the accompanying sketch, is believed to be a locust but World Health Organization charts do not show this area to be subject to locust 'visitation'. The insect died within minutes of landing on the vessel.

No other such insects were sighted prior to, or after, this observation.

Position of ship: 17° 32′N, 56° 41′E.



Note 1. Shortly after this observation was received, Mr H. C. Thorburn, 3rd Officer on board the *Ibn Rushd* despatched to us photographs of the insect. These were sent on to the Centre for Overseas Pest Research for identification.
Note 2. Mr I. Chaney of the Desert Locust Information Section of the Centre for Overseas Pest Research, comments:
'The insect has been identified as the large grasshopper *Cyrtacanthacris tatarica*. This is frequently mistaken for the desert locust and is widespread in Africa, Pakistan and India.
'We are always grateful for any information relating to locusts and grasshoppers which may further our understanding of their distribution and ecology, and we are particularly interested in finding out which locusts and grasshoppers fly out to sea.'

BIOLUMINESCENCE

South Atlantic Ocean

m.v. *Gambada*. Captain R. J. Turney. Santos to Buenos Aires. Observer, Cadet R. C. Panemanglor.

20 June 1977. Throughout the whole of the observing officer's watch bioluminescence was observed and the bow wave glowed strongly with white caps visible up to about half a nautical mile from the vessel.

At 0600 GMT, and for about 40 minutes, a more-pronounced area of bioluminescence was observed, during which time white caps from the wind waves were visible up to about 5–6 n. mile. During this period unusual echoes were observed on the radar screen. What was thought to be a patch of rain was observed moving towards the vessel from the west, against the wind. The patch had a rather distinct edge to it unlike those edges associated with rain areas. When the vessel was observed on the radar screen to be in the centre of the patch, there was no precipitation.

No effect on the bioluminescence was observed when the Aldis lamp was switched on and off.

Weather conditions at the time of the observation were as follows: dry bulb 15·7°C, wet bulb 12·3, barometric pressure 1018·4 mb, sky overcast, wind SE, force 5. The sea temperature fell from 19·7 at midnight to 15·5 at 0600.

Position of ship at 0600: 32° 30′S, 50° 40′W.

Note. Dr P. J. Herring of the Institute of Oceanographic Sciences, comments:
'Possibly small zooplankton crustaceans such as copepods caused this phenomenon.'

Malaysian Waters

m.v. *Foh Kim*. Captain E. W. Pretyman. Sandakan Harbour and approaches. Observers, the Master, Mr Chan Kwong Yue, Chief Officer and Mr Godofredo C. Planta, 3rd Officer.

24 June 1977. At 1030 GMT the vessel was approaching Sandakan Harbour via the Main Channel and was about six n. mile off shore when bioluminescence in the form of rapid light flashes on the surface of the water was observed; the flashes were a brilliant light green in colour. They first appeared in the vessel's bow wave and were carried down both sides of the vessel into the wake. They were also observed up to about 17 metres distant on both sides of the vessel. They took on the appearance of flashing circles with a diameter of about 40 cm; these circles, however, are not to be confused with wheel-type bioluminescence.

As the vessel approached the shore the frequency of the light flashes increased and flashes were now observed at up to a distance of 50 metres on either side of the vessel. The more-brilliant flashes appeared to come from the vessel's starboard side, i.e. the north.

When about one n. mile from the shore the flashes close to the vessel were sufficient to cause a distinct glow above the water on both sides of the vessel; this glow clearly illuminated the loadline and draught marks. It continued until the vessel was stopped in the water prior to anchoring inside Sandakan Harbour. At this time the green colouring appeared to deepen as the vessel reduced speed and stopped. The luminosity also began to diminish.

At about 113c, 15 minutes after the vessel had stopped, the bioluminescence disappeared. One more remarkable example of bioluminescence was, however, observed half an hour later when the engine of a fast-moving motor boat was heard to starboard. It was not possible to see the boat but the vividly luminous bow wave and wake—brilliant green in colour—were clearly observed at a distance of about 500 metres from the vessel.

Although possibly not connected with the phenomenon observed on the evening of the 24th, it may be of interest to note that during daylight hours on the following day large quantities of green weed were observed floating just below the surface of Sandakan Harbour. The weed had the appearance of the green marine growths found on the hulls of vessels. A considerable number of jelly-fish were also observed.

Position of ship: 5° 50′N, 118° 08′E.

Note 1. The *Foh Kim* is a Hong Kong Selected Ship.

Note 2. Dr P. J. Herring comments:

'This account probably describes the mating pairs of certain marine worms—sometimes known as fireworms. The males encircle the females emitting flashes of light and a bright luminous fluid is emitted by both sexes. These swarms are only found in relatively shallow water, e.g. the frequency increased as the vessel approached the shore, and are usually limited to the hour or so immediately after sunset, as here. See also the report from the *Kowloon Bay*, *The Marine Observer*, October 1976, page 171.'

ABNORMAL REFRACTION

Mediterranean Sea

m.v. *Strathdevon*. Captain A. B. Stalker. Liverpool to Port Said. Observers, the Master, Mr L. Dharmani, 2nd Officer and Mr P. A. Hayes, 3rd Officer.

5 April 1977. At 1338 GMT visibility was reduced in all quadrants by mist and especially so in the north and east, the mist extended vertically from sea level to about 250 feet.

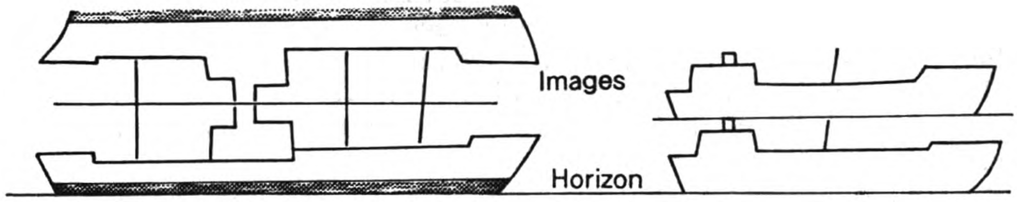
Upright and inverted superior images of the vessels, as shown in the sketch, were observed. The vessels were estimated to be at a distance of 9–10 n. mile.

At 1408 the mist began to clear from the NE. By 1425 it had cleared in all quadrants and the refraction was no longer observed.

Weather conditions at the time of the observation were as follows: dry bulb 21·5°C, wet bulb 18·0, sea temp. 17·0, barometric pressure 1015·6 mb, wind SE'ly, force 2.

That same evening at 2230 Gozo Light (Maltese Islands) was observed at a distance of 41 n. mile. The Light has a luminous range of 25 n. mile and an elevation of 180 metres. At this time the dry bulb was 17·0°C, wet bulb 15·6, sea temp. 16·3, barometric pressure 1015·4 mb, wind SE'S, force 2.

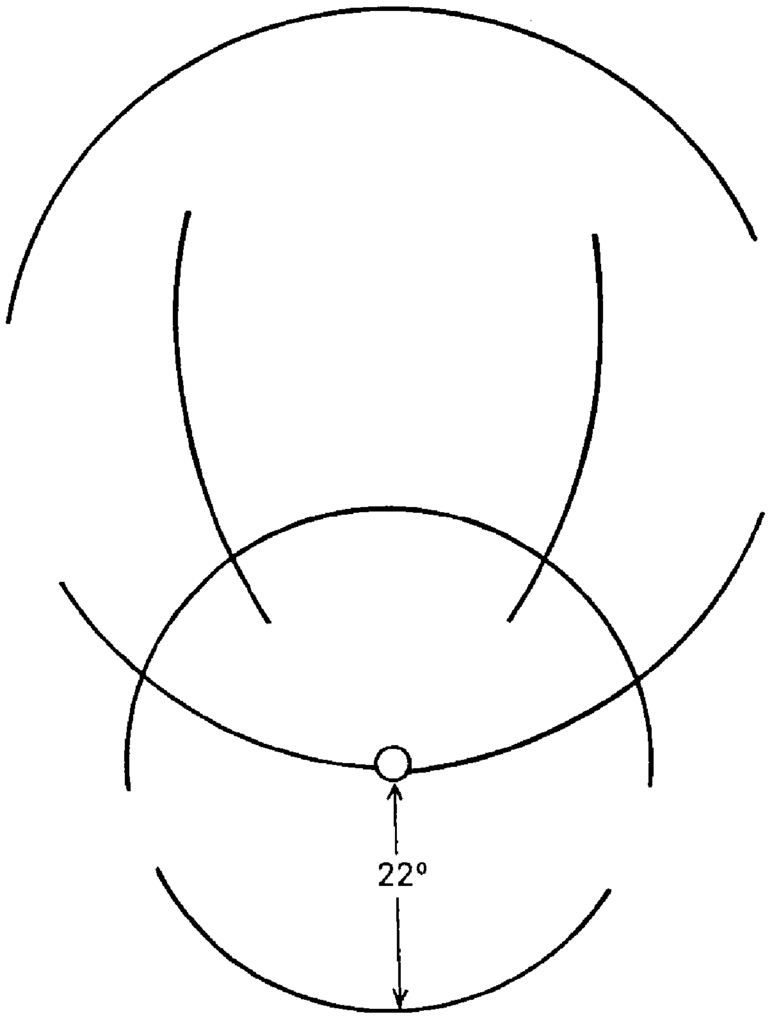
Position of ship at 1800: 36° 36′N, 12° 12′E.



SOLAR HALO

North Sea

s.s. *British Dragoon*. Captain M. J. Goulding. Isle of Grain to Hound Point (Firth of Forth). Observer, Mr M. R. Nelms, 2nd Officer.



22 May 1977. The halo complex as shown in the sketch was observed between 0830 and 1030 GMT.

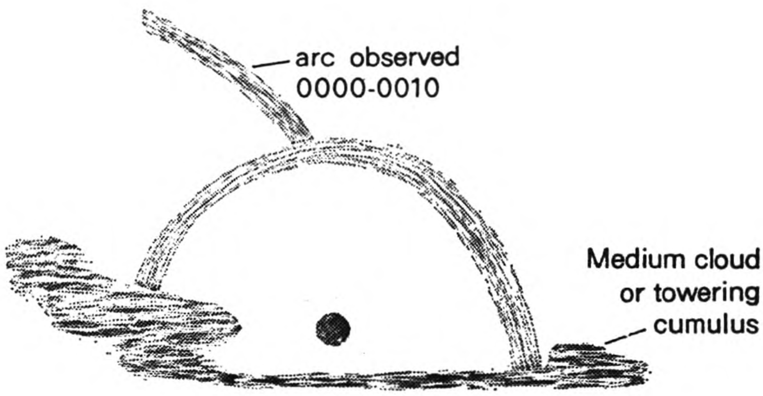
Position of ship: 55° 30′N, 01° 10′W.

LUNAR HALO

North Atlantic Ocean

m.v. *Winchester Castle*. Captain K. Morton. Bremen to Durban. Observers, Mr C. M. Turner, 3rd Officer and Mr B. Davies, A. B.

3 June 1977. At 2305 GMT when the moon was at an altitude of 23 degrees and bearing 115°T, a halo was observed. At 0000 a single arc which was visible for about 10 minutes appeared, see sketch.



A thin layer of cirrostratus cloud was present with some medium cloud and towering cumulus below. This lower cloud obscured the lower part of the halo.

Weather conditions at the time of the observation were as follows: dry bulb 28·2°C, wet bulb 26·0, wind light and variable.

Position of ship: 08° 09′N, 15° 56′W.

LUNAR RAINBOWS

South Pacific Ocean

m.v. *Gambada*. Captain R. J. Turney. Westernport (Australia) to Santos. Observer, Cadet R. C. Panemanglor.

30 May 1977. Between 1104 and 1110 GMT two rainbows were observed, each was visible for about 1½ minutes.

They were of a ghostly appearance, no colour was observed even when viewed through binoculars. At the time the phenomenon was observed the moon shone brightly through patches of stratus cloud astern of the vessel.

During the sighting of the second rainbow its radius was measured and found to be about 24 degrees. The moon's lower limb was observed to be at an altitude of about 17 degrees on a bearing of 276 degrees.

It was noted that on each occasion the rainbows, which were both at first observed to be at an apparent distance of one n. mile, seemed to be moving towards the vessel. Both rainbows spanned the vessel and on reaching an apparent distance of one cable from the vessel they faded away.

Weather details were as follows: dry bulb 6·8°C, wet bulb 6·3, barometric pressure 1020·4 mb, 5 oktas of cloud, mainly stratus, visibility good, wind SSW, force 4–5, sea moderate with moderate southerly swell.

Position of ship: 47° 20′S, 126° 45′W.

Note. Rainbows are not infrequently observed by moonlight but as the human eye cannot distinguish colour with faint lights, the lunar rainbow appears to be white.

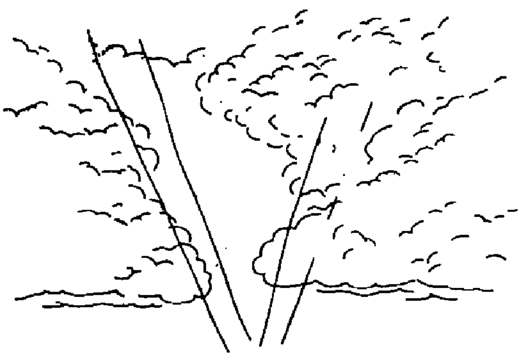
ANTI-CREPUSCULAR RAYS

Indian Ocean

s.s. *Liverpool Bay*. Captain J. Bold. Kobe to Suez. Observers, the Master and ship's company.

17 May 1977. Soon after sunrise two well-defined rays of light were seen to radiate from the sun. They illuminated the cloud directly above the vessel and

converged at a point just above the western horizon on a reciprocal bearing and altitude to the sun, see sketch. These anti-crepuscular rays ranged in colour from white to pale blue and were visible for about five minutes. They disappeared when the sun was obscured by cloud.



At the time of the observation there was a total of six oktas of cloud, made up of altocumulus at different levels in the north-eastern quadrant and about five oktas of cumulonimbus base about 1000 feet elsewhere. A waterspout and rain showers reaching the surface were observed within a distance of three n. mile. The dry bulb temperature was 29·0°C, wet bulb 25·8, barometric pressure 1010·1 mb, wind ESE, force 2.

Position of ship at 0600 GMT: 05° 30′N, 97° 12′E.

Note. As light rays come from the sun and so are practically parallel their apparent divergence is an effect of perspective. In favourable circumstances the light rays and shadows extend right across the sky and appear to converge, by perspective, towards a point a little above the western horizon—this is called the antisolar point. These 'anti-crepuscular rays' are generally ill-defined.

SCINTILLATION

South African waters

m.v. *Winchester Castle.* Captain K. Morton. Bremen to Durban. Observers, Mr C. M. Turner, 3rd Officer and Mr B. Davies, A.B.

12 June 1977. At approximately 1900 GMT the star Canopus was observed to be twinkling more so than usual and even with the naked eye it was possible to see colour changes taking place rapidly. With the aid of binoculars the colours were seen to be rapid flashes of blue, bright red and emerald green. At this time the altitude of the star was 14 degrees and the azimuth 216°T.

It was noticed on subsequent nights that the degree of scintillation observed around the South African coast was quite marked. This applied to shore lights as well as stars.

At the time of the observation there was one okta of small cumulus. The air temperature was 16·5°C.

Position of ship: 34° 45′S, 21° 33′E.

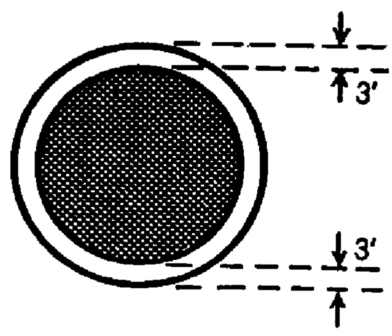
Note. Scintillation, or twinkling, is the more or less rapid change of apparent brightness of a star accompanied also at relatively low altitudes by colour changes. It is due to minor changes in the refractive power of the atmosphere. The amount of twinkling is always greatest towards the horizon and least in the zenith. The general amount varies considerably on different nights so that at the zenith twinkling may be considerable, slight or entirely absent.

SOLAR ECLIPSE

Indian Ocean

m.v. *Post Enterprise.* Captain D. Owen. Port Stanvac (S. Australia) to Mombasa. Observers, Mr D. Bell, 2nd Officer and Mr R. Humby, Radio Officer.

18 April 1977. At 1105 GMT an annular eclipse of the sun was first observed, at this time the temperature in the sun was 42°C. The middle of the eclipse occurred at 1131 at which time the true altitude of the lower limb of the moon measured by sextant was 48° 49′ and the bearing 292°T. The amount of the sun still visible behind the moon was measured by sextant and found to be three minutes of arc at the top and bottom, see sketch. At this time the temperature in the sun had fallen to 32°C



and the cumulus cloud present took on the appearance of grey, heavily laden rain clouds. The shadow effect due to the reduction in light was similar to that experienced on the night of a bright full moon. The eclipse ended just before 1200.

Weather conditions were as follows: dry bulb 28·4°C, sea temp. 26·4, barometric pressure 1009·5 mb, sea slight and no swell.

Position of ship at 1105: 06° 02′S, 45° 08′E.

Note. In the event of a solar eclipse the length of the moon's shadow varies from 367 000 to 380 000 km. Since its distance from the earth varies from 357 000 to 407 000 km, sometimes the tip of the shadow may not reach the earth at all. In this case an observer within the prolongation of the cone of the shadow will see a narrow ring of sunlight around the body of the moon. Such an eclipse is an annular eclipse.

06: 627.92: 629.12

The Corporation of Trinity House, London

(Chiefly from material kindly supplied by the Press Officer, Trinity House Lighthouse Service)

Humber, Dowsing, Smiths Knoll, Varne . . . names which mean little to some listeners to the shipping forecasts broadcast on BBC radio but to seafarers these light vessels are almost as permanent as the hazards they mark. Over half of the 21 Trinity House light vessels around the coasts of England and Wales regularly send meteorological observations to the Meteorological Office, as do many lighthouses. This is just a small part of the many and varied services provided for the mariner by the Corporation of Trinity House, London.

The first known record of the Trinity House is that relating to its incorporation in 1514. It is clear that there was at that time an association or guild of mariners of a semi-religious character with benevolent objects which, some historians say, was founded by Archbishop Stephen Langton in the 13th century. The association had certainly been long enough established to own a hall and alms-houses at Deptford and of sufficient importance to apply for and receive a Charter from Henry VIII. The Charter was the direct result of a petition to the King stating that a scarcity of mariners was likely to result from the practice of pilotage in rivers by inexperienced young men who were 'unwilling to take the labour and adventure of learning the shipman's craft on the high seas'.

The Charter of 1514 granted to 'our beloved Liege, People and Subjects, the Shipmen or Mariners of this our Realm of England' power to establish a 'Guild or perpetual fraternity of themselves . . . as well Men and Women with the power and authority, for ever, of granting and making laws, ordinances and statutes amongst themselves, for the relief, increase and augmentation of the shipping of this our Realm of England', and ordained that yearly a Master, four Wardens and eight Assistants were to be elected and provision made for the appointment of a Chaplain.

From its inception to the present day, Trinity House has kept as its objects the safety and progress of navigation and the welfare of seamen and their dependents. For this it was first incorporated and its authority has been confirmed and renewed by successive Sovereigns.

In the reign of Elizabeth I, Trinity House acquired its Grant of Arms and also authority to erect seamarks. In 1594 the Lord High Admiral surrendered to her Majesty the rights of beaconage, buoyage and ballastage vested in him with the recommendation, which was adopted, that these be bestowed upon Trinity House.

The right to raise ballast from the bed of the Thames was abandoned in 1893 owing to the introduction of water ballast making it no longer remunerative, but up to that time it provided a considerable revenue which was devoted to the relief of 'decayed seamen, their wives, widows and orphans'.

The rights of beaconage included, of course, lighthouses although a long interval elapsed before the Corporation had all major English lighthouses permanently under its control owing to the practice of the Crown of issuing patents or grants of lighthouses to private individuals who, on payment of a rent, had the right to collect the tolls. These private lights, as may be imagined, varied in efficiency and in some cases were poorly organized and it was not until 1836 that Trinity House was empowered to buy them out.

The Trinity House history as a pilotage authority took on a much more straightforward course. The Charter of 1514 gave Trinity House general powers to regulate pilotage and, in 1604, James I conferred on it rights concerning the compulsory pilotage of shipping and the exclusive right to license pilots in the River Thames. The Trinity House Outport Pilotage Districts were established by George III in 1808 but it is clear that many of them had existed long before that time.

The first reference to Elder and Younger Brethren was made in 1604 when the Charter of James I raised the number of the Court to 31 of which 18 were given the name 'Elder Brethren'. Provision was made for the proper appointment of Deputies and all the remaining members of the Guild, from whom the ruling members were elected, were to be called 'Younger Brothers'. These were admissible at the pleasure of the Court and, though entitled to vote in the election of the Master and Wardens, they had no other function in the Corporation.

Since it received its first Royal Charter on 20 May 1514 Trinity House has evolved until today, its work consists of three main functions these being the Lighthouse Service, Pilotage and Charities.

The Lighthouse Service

Trinity House has the sole power of erecting lights for general navigation and the Lighthouse Service is responsible for fixed and floating seamarks, visual, audible and electronic aids to navigation. Within its area of jurisdiction there are 93 lighthouses, 21 light vessels and, on station, nearly 700 buoys, over two-thirds of which are lighted. Although some local and Harbour Authorities maintain seamarks within their own port limits, these are regularly inspected by Trinity House and the sanction of the Corporation must be obtained before any changes can be made. Similarly, Trinity House has certain powers over seamarks maintained by the General Lighthouse Authorities in Scotland and Ireland. Trinity House is also responsible for dealing with wrecks around the coast of England and Wales with the exception of those occurring within local port limits and wrecks of HM Ships.

The present-day powers of Trinity House stem in the main from the Merchant Shipping Act 1894, and the Service is financed from Light Dues which are levied at every port in the United Kingdom and Eire, and are based on the net registered tonnage of the vessel. Local Customs Officers act as agents for the collection of dues which amounted in 1976 to about £24 000 000. The fund, which is administered by the Department of Trade, is used to finance the three General Lighthouse Authorities, these being Trinity House, the Northern Lighthouse Board and the Commissioners of Irish Lights.

For the purpose of administration the coasts of England and Wales are divided into a number of Districts each under the charge of a Superintendent and having its own store or depot and maintenance staff. The Superintendents are responsible to the Board for seeing that their part of the coastline is at all times properly marked for the benefit of shipping in the area.

There is a fleet of lighthouse tenders used for servicing the many aids to navigation around the coast. These special vessels of about 1500 gross tonnes are used for the relief and supply of light vessels and off-shore lighthouses, the servicing of buoys and beacons, the location and marking of wrecks and for towing light vessels which have no propulsion of their own to and from station.

Two of the Service tenders are based at Swansea—the main coastal depot for the west coast—for servicing aids to navigation along the west coast of England, Wales and the south coast as far east as the Isle of Wight, and three tenders are based at Harwich—the main coastal depot for the east coast—for servicing aids to navigation along the east coast and the south coast as far west as the Isle of Wight including the Channel Islands. Each operational tender has two full crews, each crew working fourteen days on board followed by fourteen days free from duty. The scheme has greatly improved the efficiency and productivity of the Service allowing greater utilization of a reduced tender fleet to be achieved, and, at the same time, has improved the conditions for the crews.

The re-organization has been undertaken as part of a major review into long-term Service needs and at a time when helicopters are playing an increasing role in

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The *Varne* Light Vessel, a familiar landmark to mariners in the Channel

Copyright R. S. Stokvis & Zonen N.V.

The Trinity House pilot vessel *Lodesman* preparing to land a pilot in the Channel

(*see* page 75)

Opposite page 77

photo by Gibson

The Bishop Rock Lighthouse with the Trinity House helicopter about to land with relief keepers

(*see* page 75)

Lighthouse Service work. Other changes in the administration and organization of Service work will be considered once the full effect of the re-organization has been assessed.

At Blackwall, London, are situated the Corporation's main workshops where skilled men are employed in the servicing, maintenance and, in some cases, the manufacture of Service equipment.

Although of ancient foundation, Trinity House lives very much in the present and constantly keeps abreast of technological advances with the object of improving seamarks and the conditions of the personnel manning them.

Lighthouses continue to be modernized and ageing and obsolescent equipment replaced by modern equipment capable of automatic or semi-automatic operation. Much research has been carried out on the development of light sources and fog signals. These new developments have enabled expensive, large and often cumbersome optics to be replaced by cheaper compact lenses without any reduction in the power of the light. Sealed beam units, like that of a car head lamp which require no optic, have been installed in a number of lighthouses, these have proved extremely reliable and efficient.

Fog signals too have been greatly improved. At certain rock stations where limited power is available, electric fog signal emitters have been installed consisting of banks of loudspeaker units which enable the sound to be projected directionally. In other cases modern compact and highly efficient compressed air signals have been installed.

With regard to automation and to effect economies, Trinity House has been experimenting with fog detectors which are an obvious essential for the complete automation and remote control of lighthouses where fog is a major hazard. It is hoped that in the near future the successful conclusion of this work will make complete automation acceptable to the standard of reliability which Trinity House insists upon, and which the mariner has come to expect as part of the service.

At Dungeness in Kent, Trinity House maintains a Research Station where equipment is evaluated and tested for possible Service use, this includes light and power sources together with fog signals and their associated equipment. Tests carried out are extremely exhaustive as reliability is an essential part of the Service.

Trinity House maintains a large fleet of light vessels which are stationed at important navigational positions around the coasts of England and Wales. Light vessels, which have a crew of five men, are expensive to maintain and building costs are high. Trinity House has embarked on an ambitious program of replacing some of them by other devices. At the same time, investigations are being carried out into ways and means of reducing the maintenance costs of the remaining vessels, whilst improving the conditions of personnel manning them. These new developments are expected to lead to considerable savings in maintenance costs.

As well as the routine work of displaying lights and sounding fog signals, many light vessels, because of their unique position, carry out monitoring of not only the weather in their area but also tide measurement, salinity recordings and other data that may be required by maritime agencies.

Several light vessels have been replaced by other devices; the Royal Sovereign and Inner Dowsing by towers standing on the sea bed and the Corton, Mid Barrow and Barrow Deep by High Focal Plane Buoys. The Lynn Well, Cross Sand, Cork and English and Welsh Grounds light vessels have all been replaced by Large Automatic Navigation Buoys (LANBYS). Another LANBY has been established at the Greenwich Station which marks the western extremity of the routeing system through the Strait of Dover.

The LANBY is of discus shape design, of all steel construction, weighs about 40 tonnes plus an equal weight of sea water ballast and is about 12 metres in diameter; it carries a much more powerful light and fog signal than the largest buoys at present in service. The light and fog signal are electric. It is powered by diesel generators and is fully automatic with reserve equipment in case of failure. A considerable amount of electronic aids to navigation can be carried and the machinery is capable of running for six months or more without attention.

Seemingly less important buoys play a vital and major role in safeguarding the seas. New buoyage schemes, especially in approaches to ports and harbours and in narrow sea-ways where shipping is heavily concentrated, are constantly being implemented and maintained by Trinity House. The Corporation is responsible for marking routes for specific purposes such as for deep draught vessels within its area of jurisdiction, whenever there is justification or a requirement for such action. For example, the two-way traffic separation in the English Channel/Strait of Dover through which approximately 400 ships a day pass. The routes have been marked and are maintained by Trinity House and the French Lighthouse Authority.

Trinity House has maintained unlighted buoys for over 300 years, but it was not until 1880 that a lighted buoy was first used. Today all buoys in the Service are of mild steel or wrought iron and vary in diameter from 1½ to 4 metres and weigh anything from 3–12 tonnes without moorings. Lighted buoys burn dissolved acetylene, and, in addition to the light, some buoys carry sound devices such as bells, whistles and in some cases electric fog signals. The majority of buoys today are fitted with radar reflectors to make them more readily identifiable on ships' radar. Electric lighting and plastic construction are two of the changes taking place in buoy development at the present.

On the international scene, Trinity House plays an active and prominent part in the International Association of Lighthouse Authorities (IALA) which has a permanent secretariat in Paris to organize five-yearly International Conferences and whose aim is to foster technical co-operation between member countries in every way possible. This close co-operation has enabled a number of difficult and important international projects to be carried out in an efficient and expeditious manner. Trinity House has played a leading role in the development of the new IALA Buoyage System which has been designed to replace over 30 different systems of buoyage at present in use world-wide.

As mentioned previously, helicopters play an important role in the work of the Trinity House Lighthouse Service. A helicopter under contract to Trinity House is used for exchanging keepers at 15 lighthouses and 14 light vessels with the prospect of several more light vessels being included in the program shortly.

Pilotage

Trinity House is the Pilotage Authority for London and 40 other districts including Southampton, Milford Haven and Falmouth. The Corporation licenses but does not employ the pilots who are self-employed. Control of the Service is carried out under the terms of the Pilotage Act 1913 and by bye-laws made under the terms and provisions of the Act. The Service, like the Lighthouse Service, is entirely self-supporting and receives no Government funds. Its income is derived from a levy on pilots' earnings, dues paid by vessels for shipping and landing pilots and from licence fees.

There are about 680 Trinity House pilots of whom about 450 are in the London District. To qualify, a London pilot must be of British Nationality, physically fit, possess a Foreign-going Master Mariner's certificate and have had eight years' experience as a watch-keeping officer and be under the age of 35. Having been interviewed and selected, the candidate pilot has to accompany fully qualified pilots on their trips for a period of three to six months, depending on his previous experience of the area. After completing his qualifying trip, the candidate is examined by a panel and if satisfactory, issued with his licence as a Third Class Pilot. The licence is renewed annually after the pilot has satisfied a member of the Board that he is conversant with changes in his district and that his eyesight and physical fitness remain good.

For the first three years of service, London pilots are restricted to piloting ships drawing less than 4·25 metres. After this period the pilot takes another examination and if successful gains a Second Class Pilot's licence for ships up to 12 500 tons. Finally, after one more year, he takes his first class certificate which enables him to pilot ships of any size. Normally pilots work on a roster system and all London pilots pool their earnings. The control of the London Pilotage District is in the hands of a Committee comprising Trinity House representatives, shipowners, pilots and the Port of London Authority.

In Districts other than London, the powers and duties of Trinity House are exercised and performed by a Committee appointed for each District. The Sub-Commissioners, as members are known, usually consist of representatives of shipping interests in the particular port, pilots, the Harbour Authority and men with nautical experience or interests. The Sub-Commissioners receive no remuneration for their work with the exception of fees from the granting of licences and pilotage certificates; they examine the pilots and conduct enquiries into casualties or disciplinary offences.

The Corporation owns and operates a fleet of pilot cutters, fast launches and ancillary craft in the London and Isle of Wight Districts, and also has vessels stationed at Falmouth and at several Districts which it administers on the north-west coast. As in the Lighthouse Service, Trinity House has made, and is still in the process of making, major changes in the running of the Pilotage Service.

One important development has been the replacement of the Pilot Cruising Cutters, where possible, by fast shore-based launches. Cutters are expensive to maintain and build, of necessity pilots often spend many wasted hours on board the Cutter waiting for ships requiring their services.

The first replacement scheme took place in 1957 when the Cutter stationed at the Needles entrance to Southampton was replaced by fast launches based at Totland, Isle of Wight. This scheme has not only proved to be the prototype of similar Trinity House schemes, but has also been generally adopted by other Pilotage Authorities both in this country and abroad.

Fast launches have since been introduced at Folkestone replacing the Dungeness Cutter for the south-west approach to the London Pilotage District at Harwich to facilitate the movement of ships bound to and from the Harwich and Felixstowe complex of ports, and at Ryde, Isle of Wight, replacing the Cruising Cutter which served the Nab Station until 1971. In conjunction with the introduction of fast launches, new shore communication centres have been set up. The system has shown itself to be more economical than Cruising Cutters and has improved the productivity of pilots. The only remaining Cruising Cutter Station maintained by Trinity House is that at the Sunk which marks the northern approach to the London Pilotage District and is used for providing a pilotage service for ships bound to and from London. Its position is such that a shore station/fast launch operation would incur major operational difficulties.

Pilots are fully aware of the problems associated with the navigation of large vessels, especially concerning the vulnerability of the cargo. Problems do occasionally arise when navigating in narrow channels where the lack of room for manoeuvring is greatly reduced by the depth and width of the channel. There is very little space for a ship to deviate from the channel should it be necessary to avoid another ship by the 'Rule of the Road'. Berthing too can present a problem especially where wharfs and jetties have been constructed with smaller ships in mind. To overcome these various problems only experienced senior Trinity House pilots are used on vessels over a certain size and in some cases, two pilots may be employed.

Charities

As a charitable body Trinity House maintains homes for former officers of the Merchant Services and their dependants at Walmer in Kent. Attached to the homes is a hospital specially equipped to deal with the needs of elderly people.

In addition Trinity House is responsible for the administration of a number of legacies left by former Elder Brethren and other benefactors of the Corporation.

HISTORICAL REFERENCE

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551.575.1: 061.3

Fog—a Discussion Meeting held by The Royal Meteorological Society—15 December 1976

By D. A. Bennetts

(This article is reproduced from *Weather* June 1977, by kind permission of the Editor)

With the advent of motorways and our ever-growing dependence on air transport, disruptions caused by fog have become increasingly costly in terms of lives, time and money. Organizations concerned with minimizing the operational problems caused by fog need to be informed of the physical nature of fog in order that realistic assessments of the feasibilities of proposed practical solutions can be assessed. This discussion meeting, held at Imperial College, London, was arranged to bring these operational and scientific interests together.

In his opening address, the Chairman, Mr P. Goldsmith (Meteorological Office), pointed out that the main physical problem, as with so many other meteorological phenomena, is one of scale; to understand fog structure in a given situation one must look at the microphysical scale, yet to forecast it, the synoptic scale is important. There is a large gap between our physical knowledge of the information, structure and dispersal of a given fog, and our ability to forecast when and where fog will occur and what the visibility will be.

Mr H. A. Douglas of the Operational Instrumentation Branch of the Meteorological Office presented details of a joint experiment with the Transport and Road Research Laboratory (TRRL) and the Police Scientific Development Branch (PSDB) which is being conducted on a section of the M4 Motorway near Reading (some readers may have seen the black boxes near the Theale junction). The experiment has two main aims—to establish the performance of two prototype instruments for measuring visibility and to produce a comprehensive data set over a period of about six months to provide a basis for future studies. As a result of this experiment operational trials are being established on the M1 Motorway in Derbyshire, and TRRL are looking at the variation in traffic movement and driver behaviour in various visibility ranges. Unfortunately the main problem, that of forecasting the time of onset of fog and the likely minimum visibility, are no nearer solution, but the data being obtained are valuable for testing any future theoretical ideas.

Mr J. B. Lawson of the Meteorological Office, RAF Honington, gave a very enjoyable talk on the practical aspects of fog forecasting. He made the point that much of the current research into fog is concerned with the growth of fog from the time it first formed and the structure once fully developed. However, the problem of forecasting fog starts some 12 hours earlier. Both the synoptic situation and vertical structure of the atmosphere need to be correctly interpreted before even evaluating the possibility of fog, then wind, cloud cover and local topographic effects should be considered. He presented a reconstruction of a sequence of a fog forecast demonstrating first how the formation of fog is dependent on the synoptic situation and secondly just how subjective present forecasting methods are, both of the onset and clearance. It was a sober reminder for researchers that much remains to be understood fully.

Mr D. A. Bateman of the Royal Aircraft Establishment (RAE) Farnborough described the results of two investigations being carried out there. The first was a study of the vertical profiles of visibilities in fog using Plessey Point Visibility meters mounted on a 30 m tower, and was carried out for the Civil Aviation Authority in relation to the slant visual range problem. Individual visibility profiles showed considerable variation, but there was no systematic change of visibility with height. Some evidence that the fog cleared at all levels simultaneously was discounted by the (as yet) small number of samples and the limited height of the tower.

The second project involved the use of a simple back-scatter detector system which was used to obtain a correlation between back-scattered intensity and visibility. It was found, during the development and dispersal phases, that there was a very large increase (decrease) in back-scattering for a small decrease (increase) in visibility when the latter was about 0·5–1 km. This was accounted for in terms of droplet light-scattering theory, and its potential as a short-period precursor of fog was now being studied.

Mr D. Johnson of RAE Bedford discussed observations of horizontal and vertical fluctuation of visibility in relation to current systems of runway lighting and the visual sequence these present to pilots during their final approach to touch down in foggy situations. Criteria determining decision heights (the minimum height at which a pilot can decide whether or not to land) depended on both the airfield lighting system and the type of aircraft. A fully operational blind landing system was installed at Heathrow but there were only a few aircraft equipped to use it. The systems are too expensive for use at any but major airports. Mr Johnson presented two films of the pilots visual sequence using this system to land in visibilities of 250 m and 50 m respectively—a rather different experience from driving in fog!

The second part of the meeting was devoted to the study of the physics of fog and Dr W. T. Roach of the Meteorological Office, who organized the meeting, outlined the current field and numerical studies being carried out in the Meteorological Office and gave a review of the physics of radiation fog. On clear nights the ground cools by radiative loss to space through the atmospheric window, but the lowest few metres of the air are cooled by net radiative loss to the ground in the strongly absorbing bands of water and carbon dioxide. If fog forms, the droplets then radiate throughout the spectrum and greatly increase radiative cooling which feeds back positively to a further growth of fog. However, this process is hindered by the release of latent heat and also by gravitational settling of the drops. This settling reduces the liquid water content to the level 0·1 to 0·2 gm^{-3}. Turbulence, which in some fogs plays an important role, is found to be relatively unimportant except as a factor helping dispersal. Also before fog forms, weak turbulent diffusion allows condensed water to 'escape' to the ground as dew. If the wind drops below about one knot turbulence ceases and water appears in the atmosphere as fog. Further problems concerned with the behaviour of the fog top and reports of very low visibilities (10–20 m) are currently under study.

Mr R. Brown of the Meteorological Office then described the numerical model with which he had simulated the development and dispersal of radiation fog on a realistic time scale. He models the effects of turbulence, atmospheric radiation, droplet radiation, droplet growth and gravitational settling and presented several simulated fogs showing how the inversion lifts with the fog top and how the liquid water content remains fairly constant. By varying the parameters he was then able to disperse the fog by (a) introducing a layer of stratocumulus cloud, (b) simulating solar insolation and (c) increasing the turbulent diffusion coefficients which represents the wind increasing. One of the many uses of the model is that each of these processes can be studied in isolation rather than combined, as often occurs in nature. In answer to a question by Dr K. H. Stewart (Meteorological Office) concerning the improvement of forecasting he agreed with Mr Lawson that there was still a large gap between current research and its application.

The last speaker was Dr S. J. Caughey of the Meteorological Research Unit, Cardington, who gave an account of the acoustic sounding techniques used to detect fog tops and more generally the study of the nocturnal boundary layer. The experiments have been conducted at the Meteorological Research Unit, RAF Cardington and consist of beaming sound pulses upwards and mapping the various echoes received. The problem then centres on interpreting where the fog top is in relation to its associated inversion. Mr Brown's work suggests it will be at the bottom of this layer and Dr Caughey has found this to be often the case. It is interesting to note that the strength of the echo seems to be correlated to the fog in that as the fog thins and disperses the echo weakens.

The meeting was a very interesting one, benefiting all by the joint representations of the pure and applied research into the many aspects of fog formation, structure and dispersal. Thanks are due to those speakers who conveyed the physical arguments of their research rather than presenting endless results and the meeting was thus enjoyed by expert and amateur alike.

REPORTS OF ARTIFICIAL SATELLITES, RESEARCH ROCKETS AND ALLIED PHENOMENA

(Some comments by Mr P. Neirinck of the Science Research Council's Appleton Laboratory)

Many of the reports received from the Voluntary Observing Fleet at the Appleton Laboratory are sufficiently scientific and comprehensive to allow identification but, despite long searches lasting up to 60 hours, the end achievement is a minority of positive identifications and a majority of speculative ones. When the nature of the phenomenon can be assumed—satellite, aircraft, atmospheric sounding rocket, meteor, balloon etc.—and some questions answered—for example, is the satellite orbiting, decaying or re-fired?—the problem is still not solved. The following is a complementary list of difficulties:

(*a*) So far, 10 492 orbiting artificial satellites have been catalogued. The population of 4500 satellites still in orbit is complicated by the 950 births and 900 decays which take place annually.

(*b*) Often, official decay times are inaccurate.

(*c*) Some satellites are repeatedly re-fired at unknown times.

(*d*) Spacetrack orbital elements are not received on every object.

(*e*) The Laboratory receives a yearly flow of 600 000 sets of elements which are not in sequence and therefore require sorting.

However, these difficulties do not prevent us from being very grateful for the supply of data received from the Voluntary Observing Fleet. Very few satellite decays are observed and aircraft and ships' personnel are often the only witnesses. Without these reports such rare information would be lost for ever.

Satellites decay when the orbital period falls to 86·35 minutes which corresponds to a height of 110 kilometres. Satellites in a very elliptical orbit decay when the lower point of their orbit dips into the atmosphere at less than 100 kilometres height.

At 90 kilometres the larger decaying satellites become brighter than the planet Venus while their surface temperature reaches 3000°c. Rockets start to fragment before evaporating. The complete 'burn up' lasts from 10 seconds to 4 minutes depending on size, density and material but, for an individual observer, the visible duration cannot exceed 80 seconds. The overhead angular speed is about 5° per second. For a height of 70 kilometres, an elevation of 10° above the horizon corresponds to a distance of 340 kilometres. Usually, the extinction height lays between 60 and 30 kilometres. In exceptional cases, engine and capsule fragments reach the earth's surface.

It should be noted that a bolide*, moving towards the observer's eye, appears to have no velocity until it turns. The duration of the brightest bolides does not exceed 30 seconds but their trail may persist for up to one hour. Relative to the observer, their real speed, at a height of 120 kilometres, may reach 72 kilometres per second in the morning whilst low satellites travel at 8 kilometres per second and the slowest evening bolides at 14 kilometres per second.

The method of checking reports of bright moving objects is as follows:

(*a*) After making sure that no launch occurred near the time and co-ordinates quoted, any description close or remotely similar to a satellite decay leads to the search for any object supposed to have decayed within two days of the sighting. This provides a list of from 2 to 12 possible satellites. Elements are found for approximately 90 per cent of these and, after checking by calculation, tentative matching predictions are made. Then, any unmatched sighting is compared with some of the brightest satellites of the time—but only if predictions are available.

(*b*) In the case of atmospheric sounding rockets we wish to acknowledge the valuable assistance given by Mrs E. Robson of the World Data Centre who has provided the co-ordinates of 90 launching sites and several hundred launches. Unfortunately, some launch announcements have not yet been reported to the Centre, some sites are unknown and the numerous ballistic and military experiments in this field are not reported at all.

(*c*) We are also lacking information on balloon flights—but including the wind direction and force at the time of observation may help with identification.

The following comments relate to observations published in recent editions of *The Marine Observer:*

m.v. *Halifax Star*—phenomenon observed 15 October 1976 and published in the last October edition—identified as the decay of 76–99B, a Cosmos 859 Rocket. It was launched on 14 October 1976. Inclination, initial period and perigee were respectively 65°, 89·52 minutes and 180 kilometres.

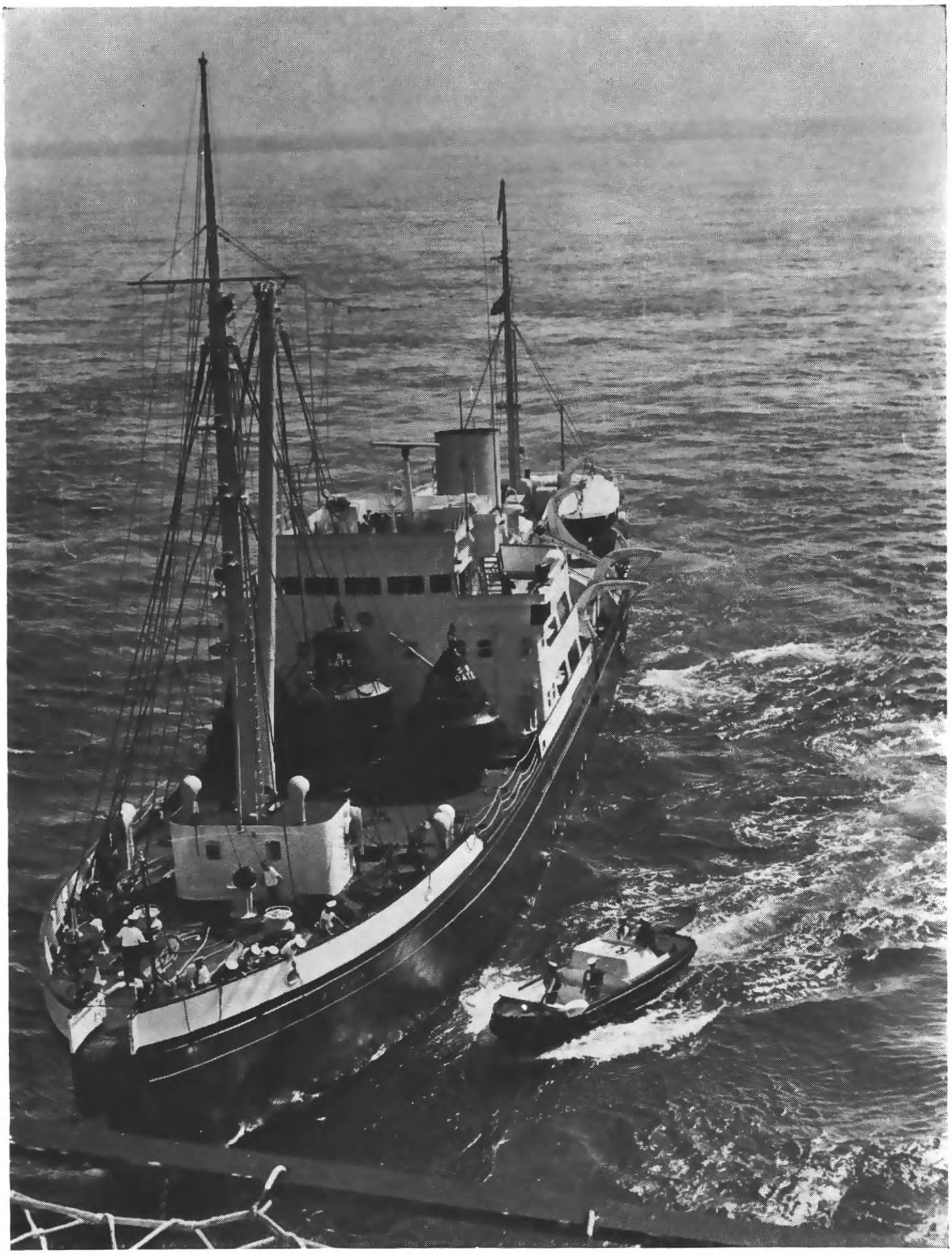
m.t. *Farnella*—phenomenon observed 16 October 1976 and also published in the last October edition—was probably an aircraft which was 'replaced' by a tumbling Russian orbiting rocket then entering into eclipse towards the South.

m.v. *Kinpurnie Castle*—phenomenon observed 24 March 1977 and published in the last January edition—possibly an atmospheric sounding rocket launched from an Atlantic island, Nouadhibou in Mauritania, or Spain.

Editor's Note: The above comments were received too late to be included with the appropriate observations.

* Bolide: A large solid meteor or fireball of non-electric origin exploding during its flight through the atmosphere. A thunder-like noise is sometimes heard one to four minutes after the explosion is observed. Any part which reaches the earth's surface is termed a meteorite.

Opposite page 84



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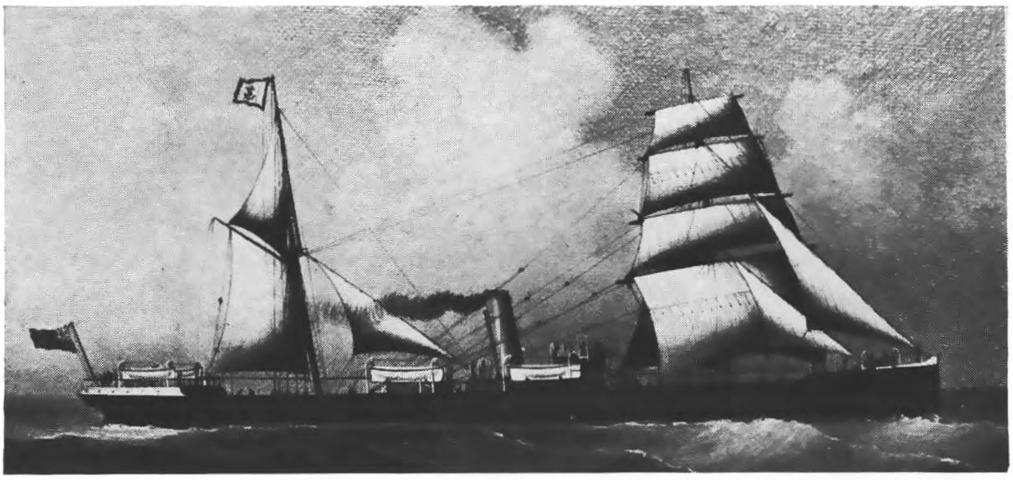
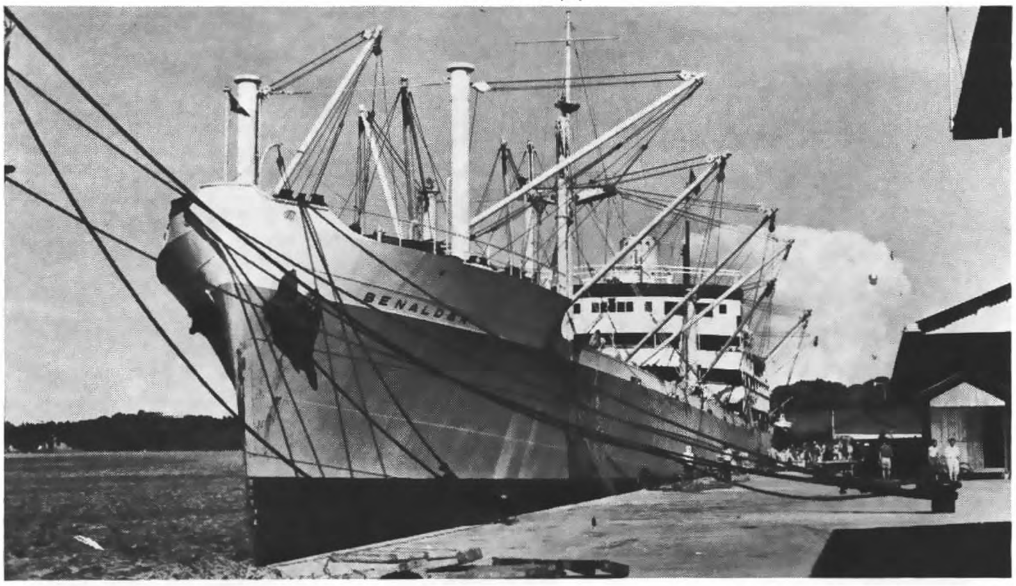
The Trinity House lighthouse tender *Siren*

(*see* page 75)

Opposite page 85



Benalder (1)



Benalder (5) *photo by Tong Photo Service*

photo by Skyfotos Ltd

Benalder (6)

VESSELS OF THE BEN LINE (*see* page 85)

LONG ASSOCIATION WITH SHIPOWNERS—THE BEN LINE

Following our usual annual practice of writing a short article about a company with whom we have had long association, we continue this year with The Ben Steamers Ltd, Wm Thomson and Co, of 33, St Mary's Street, Edinburgh.

Alexander and William Thomson, having previously worked in their father's building business, decided in 1825 to set up business on their own as shipbrokers in Leith. Their connection with the family building business continued, however, and they acquired their first ship, the *Carrara*, in 1839 for the carriage of marble from Leghorn to Leith. The maritime interests of the brothers prospered with Alexander mainly concerned with the trading side of the business whilst William looked after the management of the ships.

The *Carrara* was the first of 25 sailing vessels whose trading patterns included Italy to Canada, Australia, and in 1859, to the Far East. In 1847 Alexander Thomson withdrew from active partnership and the style of the firm was changed to Wm Thomson and Co., as it is to this day.

After the decline in the Canadian trade, the trade to the Baltic was opened up using steamers only. This venture showed a modest profit and in the four months of the year when the Baltic was closed to navigation, the owners, after repairing and refitting their ships, usually managed to find charters for at least the largest of the vessels.

It was in the trade between Europe and the Far East that the firm was to make its name as The Ben Line—the ships being named after Scottish mountains with the prefix 'Ben'. The first steamship, *Benledi*, was built in 1871 and was specially designed for the highly competitive service to the Far East through the Suez Canal.

As far as can be determined from our Archives the first Ben Line ship to make voluntary observations for the Meteorological Office was the *Benalder*, an iron steamship of 2054 gross tons which was completed by A. Stephen and Sons of Glasgow in 1880 and recruited by the Meteorological Office sometime during 1885. The *Benalder's* first meteorological logbook covered the period 25 October 1885 to 2 April 1886. She was commanded by Captain William Waring on a round voyage from London to Japan calling outward and homeward at Singapore, Hong Kong, Kobe, Yokohama and, homeward only, at Colombo.

Captain Waring seems to have had a fairly normal voyage for the time of year. A mercury barometer, loaned to the vessel by the Meteorological Office which at that time was part of the then Board of Trade (BOT) became defective during the voyage—a situation not uncommon today. An interesting logbook entry made whilst in Hong Kong reads:

> 'Sent barometer on shore to Observatory but as we were going home, and being a BOT one, would do nothing with it and unfortunately again lost some mercury out of it though had plugged the syphon hole up. They gave me a reading of their standard which was similar to ship's. The reading of ship's mercurial barometer given at noon each day under the BOT barometer.'

(The instruction about not having instruments repaired abroad remains in force up till the present time but a ship in a similar predicament today would be able to have her defective instrument replaced in a number of the world's major ports, Hong Kong included.)

As with most logbooks of this period, this one has been beautifully kept, the entries are meticulous and the hand-writing neat and legible throughout. The recruitment as a weather observing ship of the *Benalder* was followed by that of *Benlarig*, *Bencleuch* and *Benvenue*.

Expansion of the fleet in ship size and numbers continued until 1914. As coal ceased to be the principal outward cargo, so the Port of Leith was used less and less by Ben Line ships employed in the Eastern trade. Instead they loaded at London and other English east coast ports and on the Continent.

At the outset of World War I the Ben Line Fleet consisted of fourteen 'Ben' ships and five Baltic steamers. All the Baltic ships were taken over by the Government, two of which were sunk. Later Russia broke off her relations with the outside world making further trade to the Baltic impossible. Of the main line fleet serving the Far East, only two ships were sunk—a much lower proportion of losses than was suffered during World War II. Of the remainder, some were commandeered for direct Government service whilst the rest continued to trade to the Far East although under Government orders.

The difficulties of shipowners between the wars are well known and Ben Line was, for a time, together with other companies, compelled to carry a variety of cargo to ports which had hitherto been unfamiliar in order to keep their ships employed, but it is a proud boast of the Company that no ship of theirs was laid-up during this period.

At the outbreak of World War II the fleet had grown to 20 ships each of about 6000 gross tons. This time the Government took complete control of all shipping and most Ben ships were engaged in carrying munitions and supplies to all theatres of war, some acting as improvized troop carriers and bringing urgently needed supplies to Britain from all over the world.

The ships had their full share of battle and hardship and many officers and men were decorated for their gallantry. Some astounding accounts of shipwreck, survival and endurance occurred—perhaps the most remarkable being the case of Poon Lim, a Chinese steward in the *Benlomond*, who spent 133 days on a life-raft after his ship had been torpedoed.

During the period of hostilities Ben Line had lost 14 ships through enemy action but these had been replaced by ships built mainly in North America for the Ministry of War Transport which were managed by Ben Line.

At the cessation of hostilities in 1945 the Company set about rebuilding its fleet—only six of the pre-war fleet remained—and endeavouring to re-establish former trading links. Several of the Government built ships were bought by the Company and others returned to the Government as new buildings were completed and came into service.

Since World War II Ben Line have taken a special interest in heavy lift ships, and new cargo liners were introduced progressively into the fleet. By 1970 33 fast modern cargo liners were operating on the UK/Europe–Far East run and preparations for containerization were well in hand. The same year saw the formation of Ben Line Containers Limited which, in conjunction with Ellerman Lines Limited, introduced container services to the Far East. Since then the firm has further diversified into bulk carriers, chemical tankers, oil drilling ships and oil rigs.

At the time of writing Ben Line are the owners of a fleet of 20 vessels which includes three large container ships, and of these 15 make voluntary weather observations for the Meteorological Office. The Company also manage many more vessels, several of which are also members of our Voluntary Observing Fleet.

The photographs opposite page 85 show three of the six ships to have held the name *Benalder*.

The first photograph shows *Benalder* (1), built in 1880, which has already been described.

The second photograph shows *Benalder* (5) a steamship of 11 420 dead-weight tons with a speed of 16 knots, built by C. Connell and Company of Glasgow in 1949. She is shown in a setting which is very familiar to all mariners experienced with the Far East run—working cargo in Singapore.

The third photograph shows *Benalder* (6) and represents one of the finest types of fast modern containerships—a twin screw steamship of 49 593 dead-weight tons with a service speed of 26 knots, which was built by Howaldtswerke-Deutsche Werft in 1972 at Kiel.

During the 93 years in which the Meteorological Office has had the privilege of being associated with the Company, the years in which our fleet list has been without a 'Ben' ship are extremely few.

Our thanks to Ben Line, their serving Masters and Officers, in addition to those who have served in the past, are commensurate with the vast amount of valuable information they have supplied, and are still supplying, to the Meteorological Office.

We wish them continued success in all their operations in the future.

J. D. B.

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM OCTOBER TO DECEMBER 1977

The charts on pages 89 to 91 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: 1966–73 (Meteorological Office). Surface pressure: 1951–70 (Meteorological Office). Air temperature: 1951–60 (US Department of Commerce, 1965). Sea-surface temperature: area north of 68°N, 1854–1914 and 1920–50 (Meteorological Office, 1966), area south of 68°N, 1854–1958 (US Navy, 1967).

October

The main anomalies of pressure and temperature were in the Kara Sea associated with cold winds from the north-east. Ice formed rapidly here during the month and there was some excess over normal by the end of the month, particularly along coasts. In the vicinity of Spitzbergen the ice edge at the end of the month lay north of the normal position after a period with more winds than usual from a southerly quarter. In the Greenland Sea the distribution of ice was much as usual for the time of year but in the Denmark Strait an excess of ice from the previous month or two persisted and even increased somewhat. Although the anomalies of pressure and temperature during October were only slight over Davis Strait, Baffin Bay and Foxe Basin there were large excesses of ice in these areas where the melt of the summer had been less extensive than normal.

November

The largest discrepancy between the ice edge and its normal (1966–1973) position was in the Greenland Sea; the large deficit there cannot be readily explained in terms of pressure and temperature anomalies. The freezing of Hudson Bay and Davis Strait was rather less rapid than is usual during November, with temperatures in these areas higher than normal, so that the large excesses of ice at the beginning of the month were much reduced by the end.

December

The large deficit of ice in the Greenland Sea continued; winds there were more southerly and temperatures a little higher than normal. Elsewhere, with generally small anomalies of pressure and temperature during December, the ice edge by the end of the month was mainly close to its normal position. However, some deficit persisted in the Davis Strait. The coverage of Hudson Bay by ice was complete about the middle of the month.

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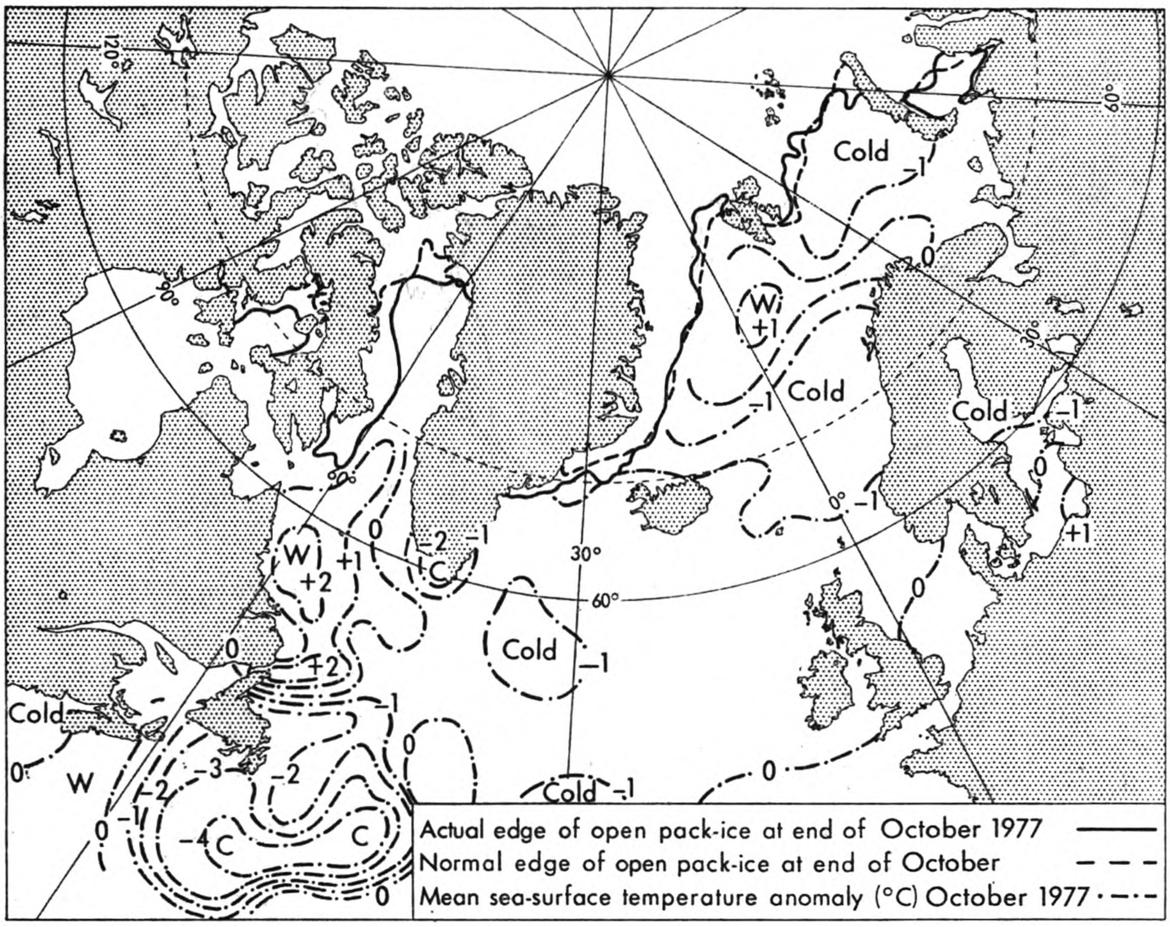
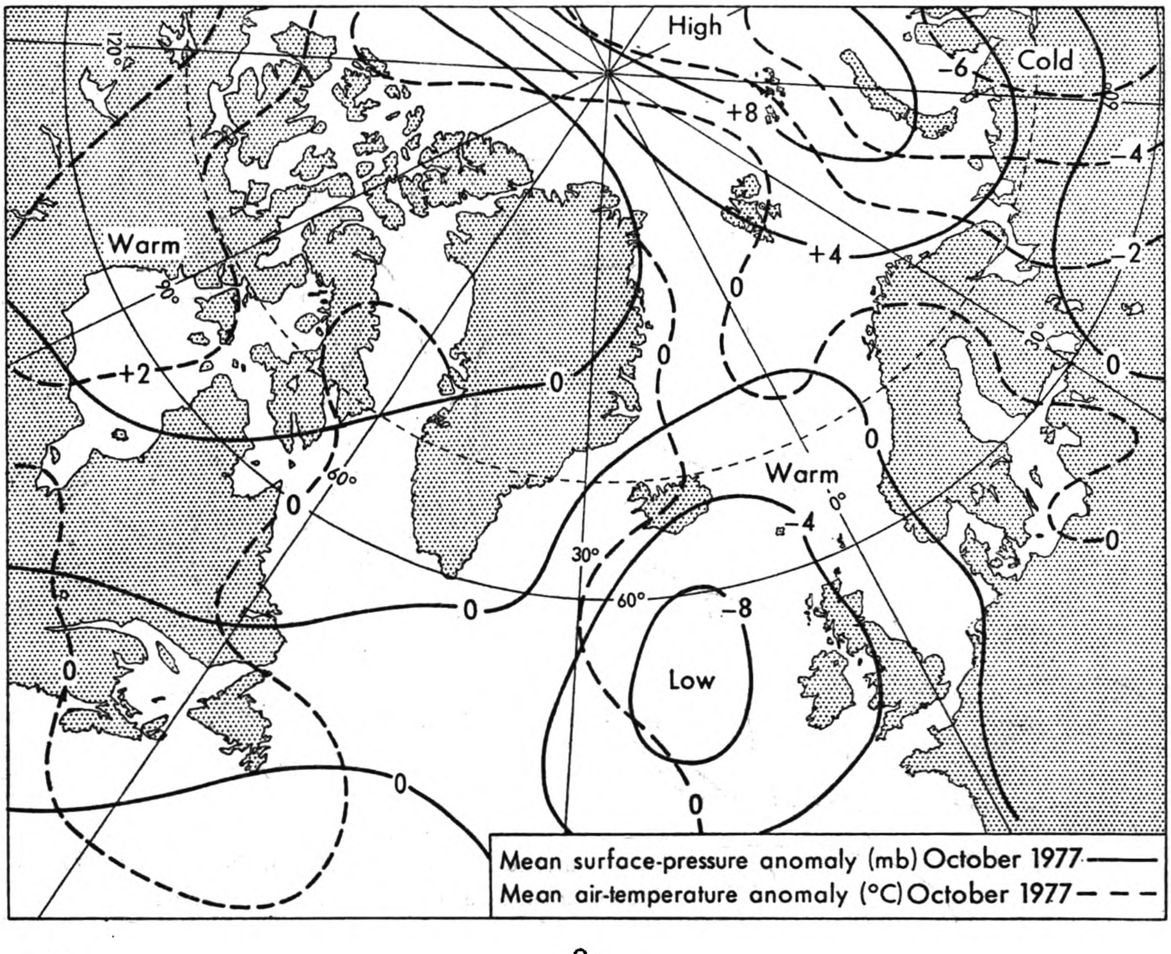
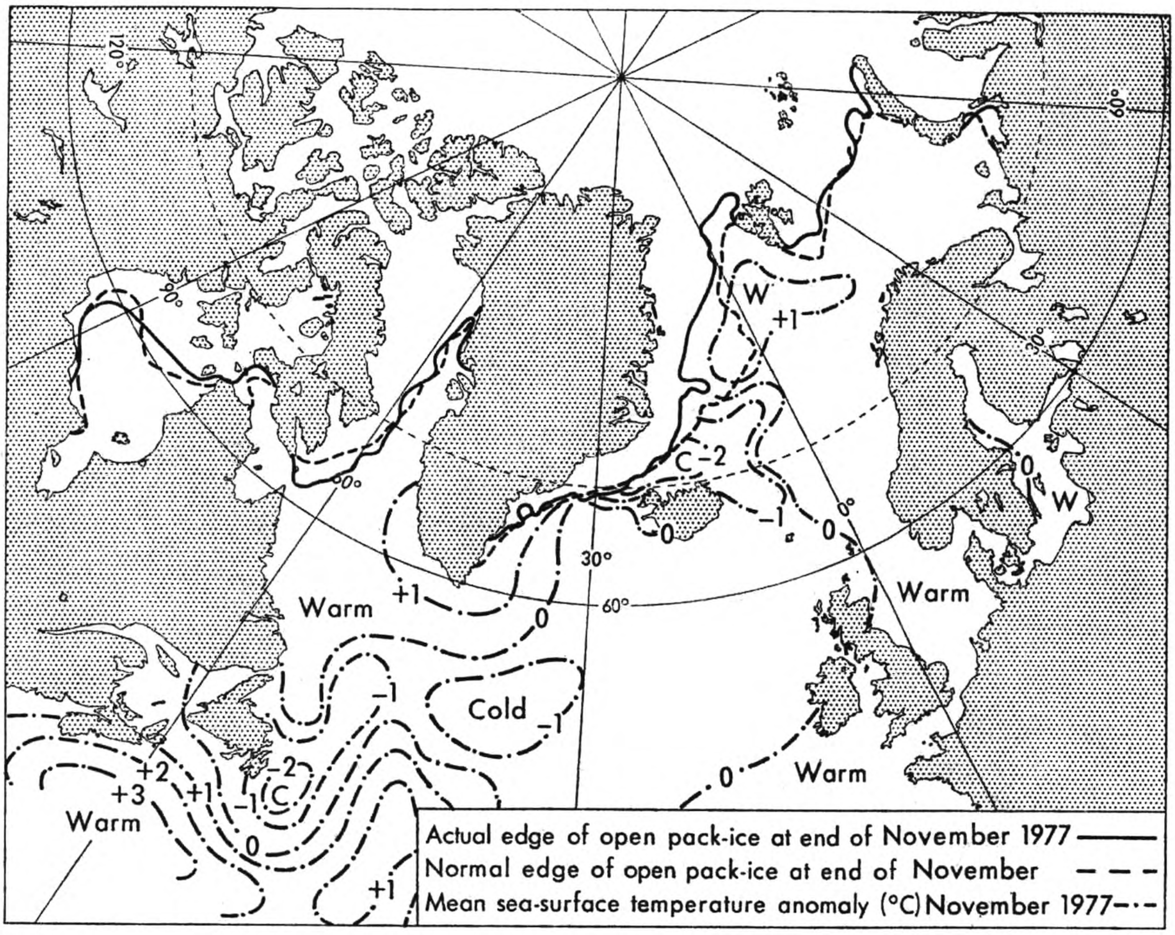
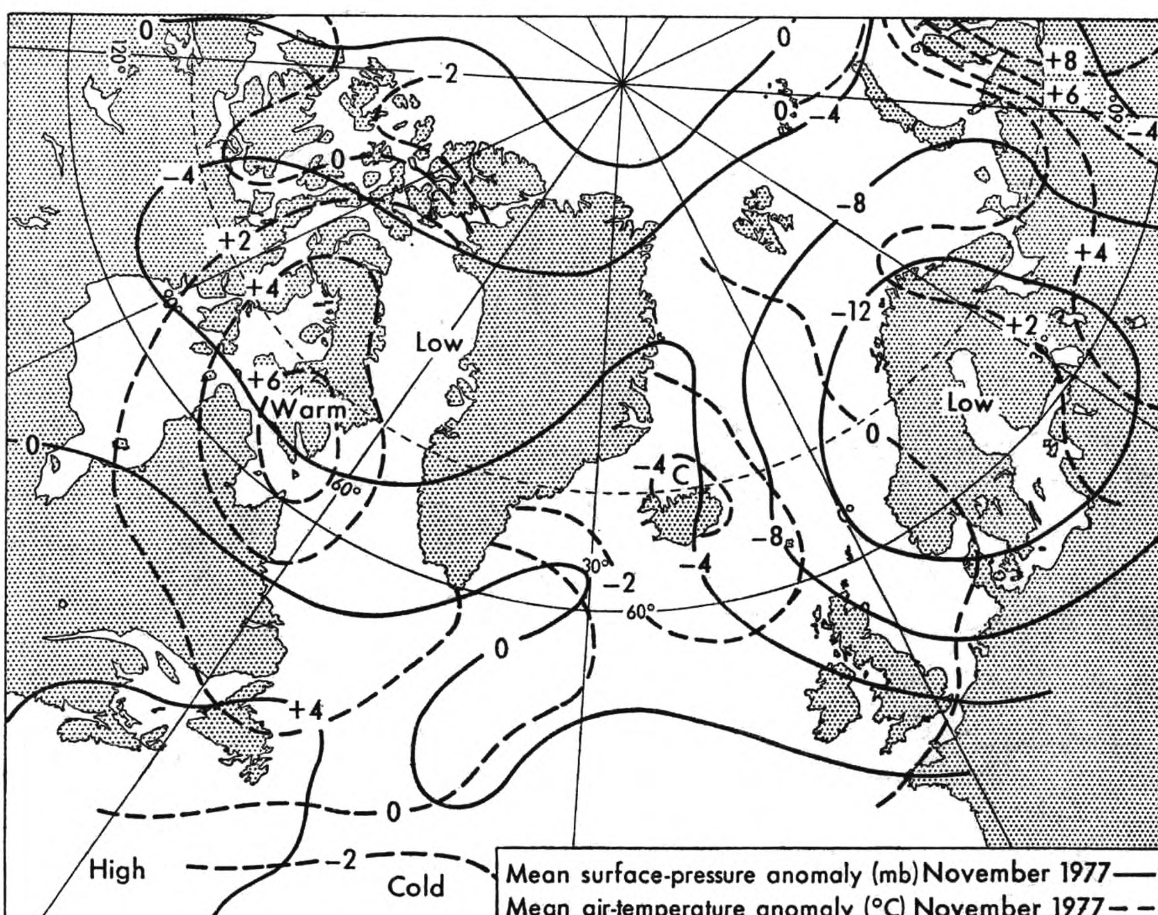
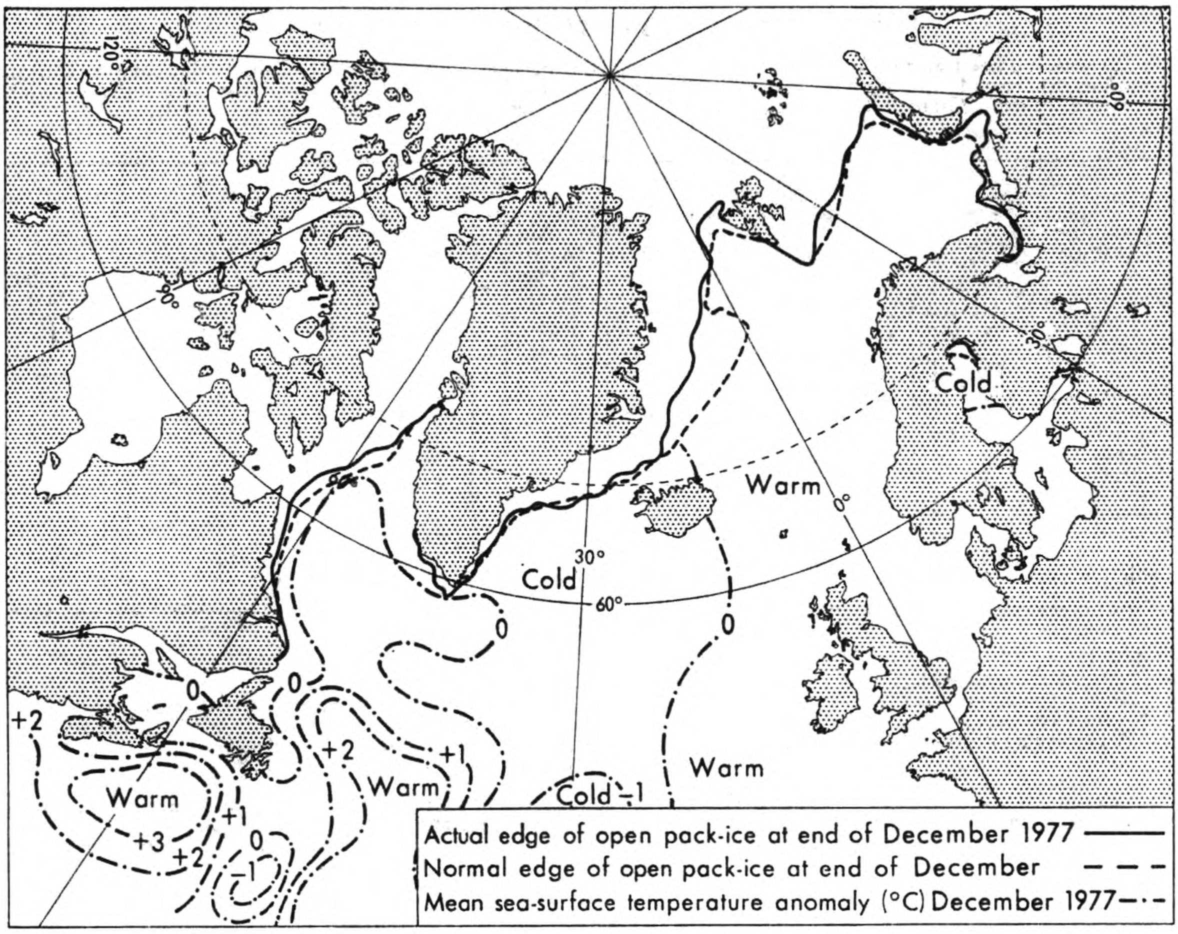

Cold
W
+1
Cold
Cold
W
+2
+1
-2
-1
C
Cold
-1
Cold
W
-3
-2
-4
C
C
Cold
-1
Actual edge of open pack-ice at end of October 1977
Normal edge of open pack-ice at end of October
Mean sea-surface temperature anomaly (°C) October 1977

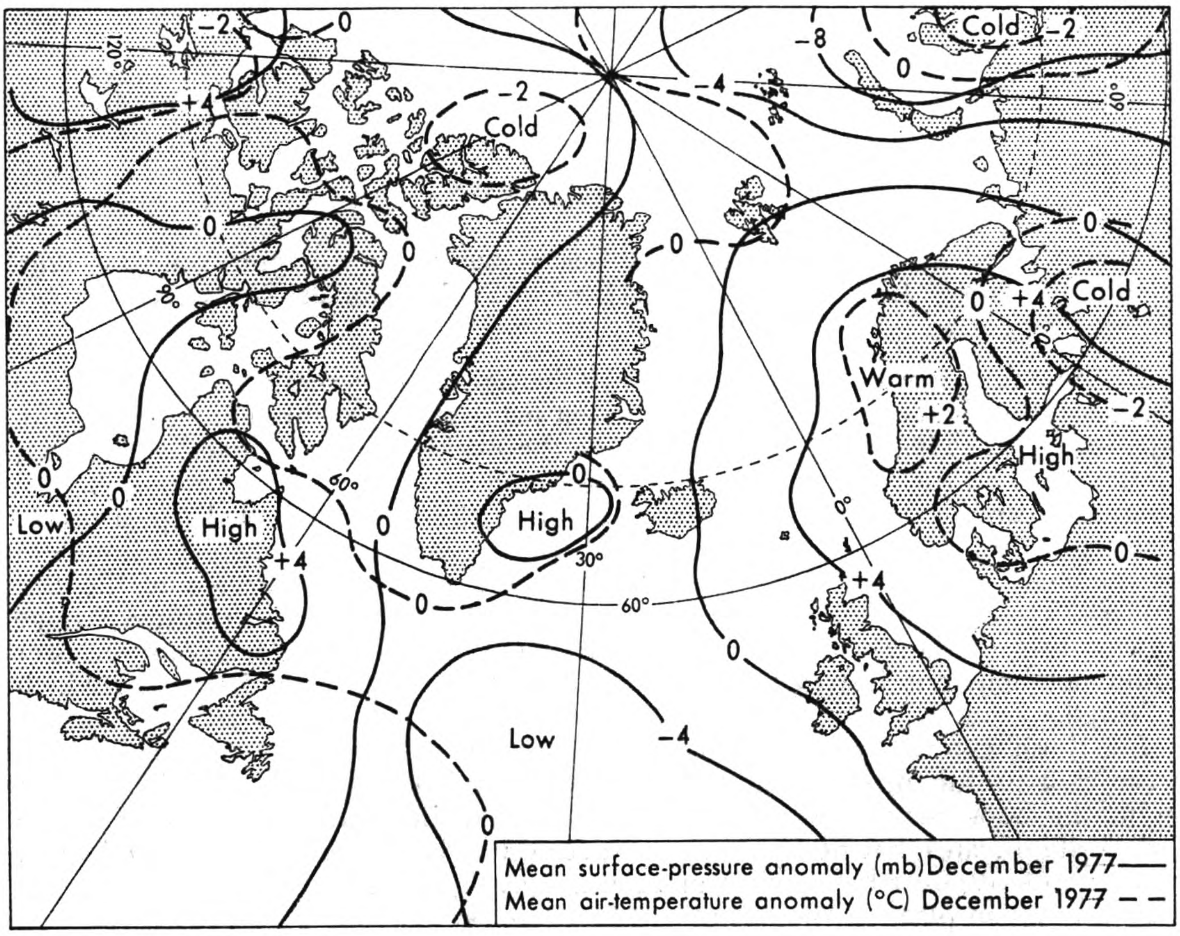

High
Cold
-6
+8
-4
+4
-2
Warm
+2
Warm
-4
-8
Low
Mean surface-pressure anomaly (mb) October 1977
Mean air-temperature anomaly (°C) October 1977

E


Actual edge of open pack-ice at end of November 1977
Normal edge of open pack-ice at end of November
Mean sea-surface temperature anomaly (°C) November 1977
Warm
Cold
Warm
Warm
Warm
W
W
C
C
120°
90°
60°
30°
0°
60°
30°


Mean surface-pressure anomaly (mb) November 1977
Mean air-temperature anomaly (°C) November 1977
Low
Low
High
Cold
Warm
C
120°
60°
30°
60°


Warm
Cold
Warm
Cold
Warm
Warm
Cold
Actual edge of open pack-ice at end of December 1977
Normal edge of open pack-ice at end of December
Mean sea-surface temperature anomaly (°C) December 1977


Cold
Cold
Cold
Warm
High
High
High
Low
Low
Mean surface-pressure anomaly (mb) December 1977
Mean air-temperature anomaly (°C) December 1977

Baltic Ice Summary: October to December 1977

No ice was reported at the following stations during the period: Riga, Ventspils, Tallin, Mariehamn, Turku, Bredskar, Sundsvall, Stockholm, Kalmar, Göteborg, Visby, Emden, Lübeck, Hamburg, Bremerhavn, Kiel, Flensburg, Stettin, Gdansk, Stralsund, Rostock, Aarhus, Copenhagen, Oslo, Kristiansund Fiord.
No ice was reported at any of the stations in October.

Station	November									December								
	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days	Length of Season		Ice Days			Navigation Conditions			Accumulated Degree Days
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Leningrad ..	0	0	0	0	0	0	0	0	14	1	31	31	4	20	29	0	0	223
Pyarnu ..	0	0	0	0	0	0	0	0	—	1	31	28	17	3	13	5	0	—
Viborg ..	0	0	0	0	0	0	0	0	—	1	31	31	28	0	11	20	0	—
Klaipeda ..	0	0	0	0	0	0	0	0	—	8	15	8	0	0	7	0	0	—
Helsinki ..	0	0	0	0	0	0	0	0	29	23	31	9	0	0	0	0	0	117
Mantyluoto	0	0	0	0	0	0	0	0	—	30	31	2	2	0	2	0	0	—
Vaasa ..	0	0	0	0	0	0	0	0	42	6	31	19	11	2	17	0	0	169
Oulou ..	0	0	0	0	0	0	0	0	—	1	31	31	31	0	15	16	0	—
Roytaa ..	0	0	0	0	0	0	0	0	—	2	31	18	1	10	5	11	0	—
Lulea ..	28	30	3	3	0	3	0	0	132	1	31	31	18	0	29	2	0	266
Skelleftea ..	0	0	0	0	0	0	0	0	—	9	31	11	1	0	4	2	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

Hovercraft and Hydrofoils, by Roy McLeavy. 200 mm × 140 mm, pp. 215, *illus.* Blandford Press, Link House, West Street, Poole, Dorset BH15 1LL, 1976. Price: £2·75.

By now most mariners are familiar with the sight of hovercraft and hydrofoils in the coastal waters, estuaries and harbours at many locations throughout the world. Anyone who has had the pleasure of seeing the British Rail and Hoverlloyd SRN 4 Hovercraft and the P. & O. Line's Boeing Jetfoil *Flying Princess* on cross-Channel operation cannot fail to be impressed. Recently the reviewer had the pleasure of visiting an Equipment Exhibition, part of which consisted of a display of modern patrol boats and other craft, on that reach of the Thames adjacent to the RN College, Greenwich. This display took place immediately after a routine passage downstream of the *Flying Princess* outward bound for Zeebrugge. Your reviewer could not help but feel that she somewhat stole the lime-light from that which followed.

For those who may not have any great knowledge of such craft, this book would serve as a useful introduction to their history and development. Whilst, at first sight, the book may appear to be somewhat juvenile—indeed the author in his foreword indicates that he had the non-specialist and younger reader in mind when he wrote it—it nevertheless gives an accurate précis of the important developments that have taken place in the evolution of surface skimmers.

Over the years, the speeds of conventional displacement ships have not increased in the same order of magnitude as those of other competitive forms of transport. Throughout maritime history two main problems have beset the ship designer in his quest for higher performance—these are the nature and density of the medium through which the ship has to travel and the fact that the higher the speed attained by the ship in a sea-way the greater the discomfort of the occupants and the more likelihood of damage being incurred to both ship and cargo.

During the late 1800s it was realized that, in order to provide speed and comfort, it was necessary to evolve a system capable of lifting the hull clear of the water and, at the same time, 'uncoupling' the craft from the motion of the waves. The solution marked the origin of the two new classes of marine vehicles—air-cushion craft and hydrofoils. Both concepts are regarded as having the potential of raising speeds to at least 100 knots and, in the case of large vessels, these limits may be more than doubled.

Growing numbers of small air-cushion craft and hydrofoils are in service today on inland and coastal waters the world over. Few of these craft are over 200 tonnes and not many have been designed to venture out into the open sea. Now, however, most of the problems have been solved and very much larger vessels are under development which have an ocean-going capability.

The format of the book is some 79 pages of skillfully drawn colour illustrations of the subject craft followed by 100 pages of descriptive narrative and is completed with a useful glossary of the terms, acronyms and abbreviations without which no new development seems to be able to 'get off the ground' these days. Whilst the book is chiefly marine orientated, it does not overlook the important development of air-cushion technology in the aviation and land transport fields.

It would be difficult to find a better qualified author of such a book as this than Roy McLeavy, for, not only is he a technical and marketing consultant for air-cushion and hydrofoil projects, he is also editor of *Jane's Surface Skimmers*. Further, he was for some time joint editor and publisher of the world's first monthly magazine devoted to hovercraft and hydrofoils.

The 150-odd illustrations so ably drawn by J. Wood assisted by E. Bruce, B. Hiley and J. Pelling range from a small DIY hovercraft and hydrofoils fitted to small sailing catamarans to the SRN 4, the Boeing Jetfoil and even further to a 2000 tonne anti-submarine warfare hovercraft being developed for the US Navy.

The only criticism that the reviewer can make of this otherwise very interesting and informative small book is the use of both metric and non-metric terms in the text. It is somewhat disconcerting to read in one paragraph of weight expressed in tonnes and then next in tons. Even worse perhaps to the younger reader, to find pressure expressed in psf—an abbreviation which unfortunately does not appear in the Glossary.

C. R. D.

Lloyd's Calendar and Nautical Year Book 1978. 210 mm × 135 mm, pp. 565. Lloyd's of London Press Ltd, London EC3M 7HA. 1977. Price: £4·50.

This Year Book was previously issued under the title 'Lloyd's Calendar' and for 1978 has been completely revised and updated to increase its value as a leading shipping, insurance and transportation year book.

Whilst the book retains its original format, several new features have been introduced. These include articles on the United Nations Maritime Organizations, the International Association of Lighthouse Authorities (IALA) Maritime Buoyage System, Marine Bird Watching, How Radar Works, Freight Forwarding, the Corporation of Trinity House, the Baltic Exchange and the Nautical Institute.

The opportunity has been taken to reproduce the new International Regulations for Preventing Collisions at Sea which came into effect on 15 July 1977.

An article on Plankton Research appears after a year's absence together with other articles which have appeared in previous editions. These include notes on Merchant Navy careers, HM Coastguard, the AMVER system, Weather News for Mariners, North Sea Oil and much other information of interest to the mariner.

As usual, and as the title implies, much of the book is devoted to information concerning the Corporation of Lloyd's and Lloyd's Register of Shipping and is a valuable directory for this alone. However, some may regret the omission in this volume of the list of offices of Lloyd's Register of Shipping in the United Kingdom outside London and also abroad as published in some previous editions. This list can now be obtained on application to Lloyd's London address.

In his Preface to this edition the Editor states that he would be grateful if shipowners, masters and others were to bring to his notice any improvement which might with advantage be made. Your reviewer has but two criticisms of what is otherwise a most useful and informative Year Book. In the section entitled Weather News for Mariners the chart showing weather forecast areas for shipping has been poorly reproduced to the degree that some of the area names are well-nigh indecipherable. Also, in the centre of the book, a Table of the Points of the Compass and their Angles with the Meridian appears—surely such a table is of little practical relevance to the modern seafarer.

Nevertheless, this is a book for which a place should be found in the chart room bookcase of every vessel, be it a VLCC or small coaster.

C. R. D.

Personalities

OBITUARY.—It is with great regret that we have to record the sad death of MR F. PATERSON, Radio Officer, at his home whilst on leave on 6 August 1977.

Frank Paterson, who was 50 years of age, was well known and highly respected on the Isle of Mull where he spent his boyhood holidays and, later on, made his home. He joined the Marconi International Marine Company as Radio Officer in 1953 and for most of his career at sea served on board Ben Line vessels until his untimely death.

We received the first meteorological logbook bearing Mr Paterson's name from the *Clydebank* in 1957. Since then his name has appeared in a further 19 books forwarded to us from the *Benvalla*, *Benalder*, *City of Edinburgh* and *Benavon*. He received Excellent Awards for his very valuable voluntary work for the Meteorological Office in 1972, 1973, 1976 and 1977.

We extend our sincere condolences to his family.

RETIREMENT.—CAPTAIN M. CHAMPNEYS retired on 31 December 1977 after serving 39 years at sea.

Michael Champneys first went to sea as an Apprentice in Houlder Brother's *Baronesa* in 1938. The majority of his war-time service was spent in the Merchant Fleet Auxiliary. Thereafter, he served with Ellerman Bucknall Line, General Steam Navigation Company, Orient Line and P. & O. Steam Navigation Company, obtaining his Master's Certificate in 1947.

Captain Champneys was promoted to Master in 1966 and appointed to command of the *Cannanore*. On the formation of Overseas Containers Limited, he transferred to Container Fleets where he was appointed the first master of that Company. His last command was that of s.s. *Jervis Bay*.

Captain Champneys sent us his first meteorological logbook from the *Otranto* in 1951. Since then we have received a further 30 logbooks bearing his name, of which 13 were classified as Excellent. He received Excellent Awards in 1967, 1974, 1975 and 1976.

We wish him a long, healthy and happy retirement in Bognor Regis.

Notices to Marine Observers

FACSIMILE TRANSMISSIONS FROM BRACKNELL (GFE)

On 1 March 1978, the transmission times of facsimile charts of interest to mariners from Bracknell (GFE) were changed and are now as follows:

GMT	CHART
0345	Surface Analysis
0500	Surface Prognosis
0811	North Atlantic Wave Analysis
0817	24-hour North Atlantic Wave Prognosis
0824	48- and 72-hour Surface Prognosis
0853	Circumpolar Surface Analysis
0945	Surface Analysis
0952	48-hour North Atlantic Prognosis
1000	72-hour Extended North Atlantic Inference
1100	Surface Prognosis
1135	British Isles Coastal Waters 5-day Mean Sea Temperatures
1413	Sea Ice Observations
1545	Surface Analysis
1700	Surface Prognosis
2011	North Atlantic Wave Analysis
2017	24-hour North Atlantic Wave Prognosis
2145	Surface Analysis
2152	48-hour North Atlantic Wave Prognosis
2300	Surface Prognosis

WEATHER BULLETINS FOR SHIPPING BROADCAST ON BBC RADIO

The attention of mariners is drawn to the following change in BBC Radio broadcasts scheduled to take place on 23 November 1978.

Whilst the weather bulletin for UK coastal waters presently broadcast on BBC Radio 2 will, from that date, form part of BBC Radio 4 broadcasts, they will continue to be transmitted on 200 kHz i.e. 1500 metres.

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