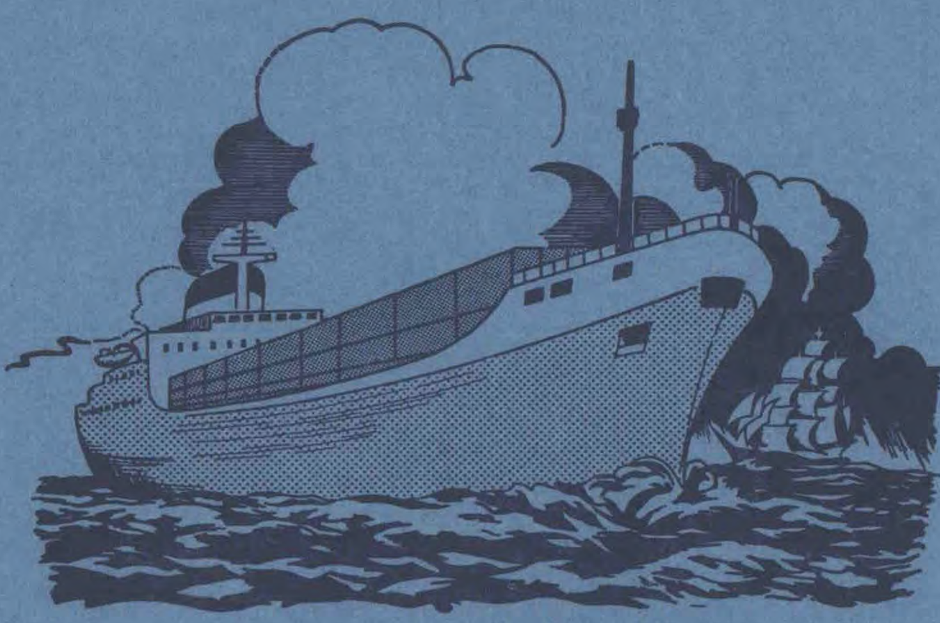
Met. O. 932

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. L **No. 268** **APRIL 1980**

CONTENTS

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Report of Work for 1979

(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*) 465 Selected Ships, including 4 trawlers, which are supplied with a full set of meteorological instruments on loan and which make observations in code every 6 hours and transmit them to the appropriate coastal radio station wherever their voyages take them.

(*b*) 25 Supplementary Ships, including 5 trawlers, which make less-detailed observations than Selected Ships and are supplied on loan with only a barometer, air thermometer and screen. They use an abbreviated code for their messages.

(*c*) 49 coasting ('Marid') vessels which make sea-surface temperature observations in 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*) 13 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, Channel, Dowsing and Varne light-vessels are included in the BBC weather bulletins for shipping and all report barometric pressure, using the precision aneroid. They also report barometric tendency.

(*e*) 1 Trawler which makes non-instrumental observations only and transmits 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 she is 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 continuing depressed state of the shipping and fishing industries has further reduced the size of the British Merchant Navy Fleet. The withdrawal of the older vessels in favour of larger, faster container ships has resulted in fewer ships making observations for the Office but, because the new ships spend more time at sea than their predecessors, the number of observations received has been maintained and even marginally increased. The 7 Port Meteorological Officers at London, Liverpool, Southampton, Hull, Newcastle, Cardiff and Glasgow are responsible for recruiting vessels into the Voluntary Observing Fleet (VOF) and, largely as a result of their efforts, the depletion of the VOF has been minimised despite the recession. During the latter part of the year a small number of ships which, owing to the recession had been withdrawn from service, were re-commissioned and re-entered the VOF. It is to be hoped that this slight upward trend will continue in 1980.

The Port Meteorological Officers are all Master Mariners with considerable experience in voluntary observing at sea and, therefore, are able to significantly contribute to the maintenance of a high standard of observation received from the VOF. It is gratifying to note that the standard of observing throughout the year has been well maintained especially as the meteorological work at sea in British Merchant Ships has always been carried out on a voluntary basis.

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	79	West Indies	16
Australasia	23	South America	10
Far East	31	Pacific Coast of North America	7
Persian Gulf	28	Falkland Islands and Antarctic	2
South Africa	13	World-wide trading	193
West Africa	9	Near and distant-water fishing grounds	9
North Atlantic	60		

There is a continuing trend to reduce the complements of merchant ships and it is hoped that the policy of fitting distant-reading marine meteorological instruments and the development of ship-borne automatic weather stations in newly built vessels will alleviate some of the problems caused by crew reductions. Additionally, trials have been conducted on a small number of vessels of the automatic radio transmission of ships' weather messages.

During 2 typical 5-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 1979

	JUNE	*NOVEMBER*
Direct reception from		
British ships in eastern North Atlantic	108	140
Foreign ships in eastern North Atlantic	97	92
British ships in North Sea	22	27
Foreign ships in North Sea	6	2
Ships in other waters	30	20
Total	263	281
Via other countries		
Ships in eastern North Atlantic	587	636
Ships in western North Atlantic	284	293
Ships in Mediterranean	58	49
Ships in North Sea	137	147
Ships in Arctic Ocean	88	81
Ships in North Pacific	779	835
Ships in other waters	355	387
Total	2288	2428

As in previous years, acknowledgement must be made to the many Commonwealth and foreign Port Meteorological Officers for their valuable services and assistance in the replacement of defective instruments and replenishment of stationery in UK Selected Ships on protracted voyages. These Port Meteorological Officers have also greatly assisted us with the withdrawal of instruments from British observing ships which have ended their sea-going careers in ports abroad.

2. Ocean Weather Ship Activities

Under the North Atlantic Ocean Station (NAOS) scheme the United Kingdom continued to operate 2 Ocean Weather Ships on station 'Lima' situated at 57° 00'N, 20° 00'W. The ships, *Admiral FitzRoy* and *Admiral Beaufort*, continuously manned the station throughout the year with the exception of a 4-day period during May when *Admiral Beaufort* vacated the station to land a meteorologist whose wife had become seriously ill and a further 12-hour period later in the same month to evacuate a sick crew member by helicopter.

The weather ships make hourly surface and 6-hourly upper-air observations. Sea and swell records using the Tucker ship-borne wave recorder and reports of floating pollutants for the Inter-Governmental Oceanographic Commission/World Meteorological Organization pilot project on marine pollution monitoring were continued throughout the year. Sea-water temperature and salinity readings to within 100 metres of the sea bed, observations of magnetic variation, collection of rain water samples for analysis by the International Atomic Energy Agency and collection of sea-water samples on passage to and from station for monitoring radio active content were undertaken at regular intervals. On behalf of the Institute for Marine Environmental Research, a plankton recorder was towed on about half the voyages to and from station during the year.

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 and salvage operations. Advice is also given to vessels on passage in other parts of the world on request and this year the service was extended to the southern hemisphere to advise vessels trading between Australia and South Africa and also to 2 very large crude oil carriers sailing from the United Kingdom to Panama via Cape Horn as they were too large to transit the Panama Canal.

The object of the service for conventional vessels is to select the best route for the ship to follow in order to reach her destination in the shortest possible time with the most economical fuel consumption commensurate with the least damage to ship and cargo. To achieve this, data are extracted from the ship's deck logbook to determine the vessel's response to various sea-wave fields and a ship/wave performance curve is constructed. However, the service has now amassed a large amount of performance data for almost all types of vessels and it is frequently possible to assess wave/speed characteristics from basic ship size and type information without recourse to the deck logbook. The forecasters of the Central Forecasting Office (CFO) at Bracknell provide the ship routeing officers, who are all Master Mariners with long sea-going experience, with wind and sea predictions up to 72 hours ahead at 12-hourly intervals and this information is used with the performance curve to determine the most favourable course for the vessel to follow. Subjective consideration is also given to the loading state of the vessel, navigational hazards such as shoals, sea ice and areas of fog and also to sea-surface currents. The later stages of the voyage are also borne in mind. Communication with the vessel to be routed is usually by telex prior to sailing and via pre-determined coastal radio stations whilst on passage.

4. Services for Marine Activities

Services to shipping via BBC Radio, the Post Office Coastal Radio Stations and our international radio-teleprinter and radio-facsimile broadcasts continued throughout the year. Since the reorganization of BBC wavelengths late in 1978, the forecast for Inshore Waters at 0200 on Radio 4 has immediately followed the Shipping Forecast on the same channel. Early in 1979 the opportunity was taken to eliminate the overlap in the coastal reports broadcast with the 2 forecasts; the most important change was the introduction in the Shipping Forecast of reports from the Channel Light Vessel in place of those from Portland Bill—the latter being retained in the reports broadcast in the Inshore Waters forecast. During the year the Post Office continued its expansion of coastal VHF radio stations. This programme commenced in 1966 with the addition of VHF radio facilities at the then existing 8 medium frequency coast radio stations and has since been continued with the establishment of 'slave' stations in the form of unmanned VHF stations remotely controlled from the relevant medium frequency coast radio station. These facilities provide a similar service in the way of weather broadcasts transmitted simultaneously with the medium frequency broadcasts from their controlling master station. In 1979 VHF 'slave' stations were established at Islay, Skye and Lewis. Requests via radio-telephone from ships at sea for forecasts are still handled by CFO, who also continue to issue gale and storm warnings for waters around north-west Europe and eastern North Atlantic as far as 40°W.

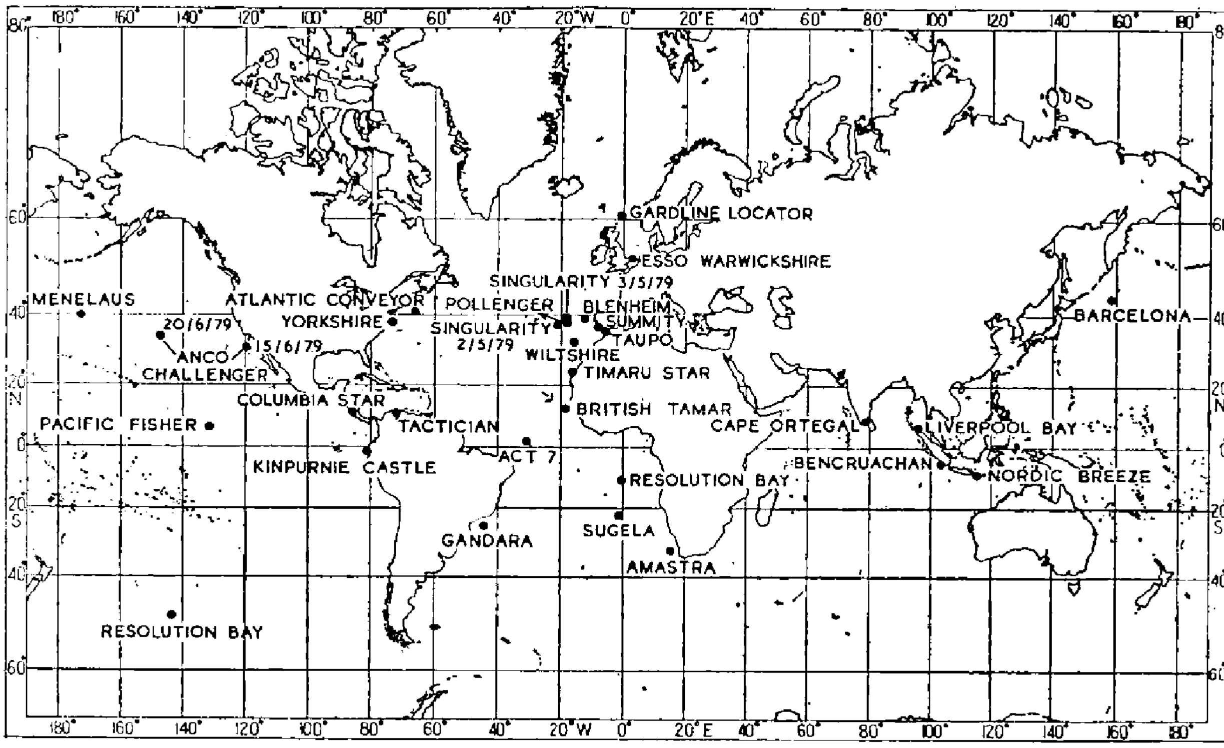
The needs of fishermen and yachtsmen for up-to-date local weather information relating to inshore waters has been recognized by the broadcasting authorities and during the year more forecasts of this type were broadcast than ever before by both BBC and independent radio stations.

5. Inquiries

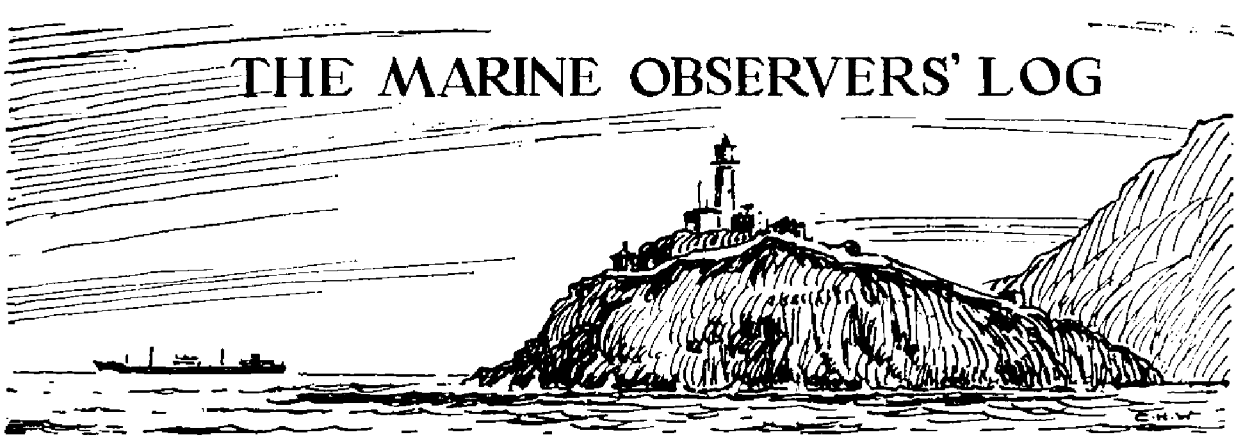
The number of marine inquiries, principally from shipping interests, solicitors, universities and industrial firms has continued to increase. The subjects of the inquiries are extremely varied and this year ranged from the weather conditions experienced by the *Queen Elizabeth* whilst carrying troops across the Atlantic in 1942 to those prevailing during the recent tragic Fastnet yacht race.

6. Awards to Voluntary Observers

The shipmasters, principal observing officers and radio officers who were responsible for submitting the best meteorological logbooks during the year were, as usual, presented with Excellent Awards in the form of books. Similar awards were made to masters and officers on short sea trades for their work in making sea-temperature observations and also to a skipper and radio officer who served in a trawler making and transmitting non-instrumental weather observations. The books selected for this year's awards were *The University Atlas*, *Cassell's English Dictionary* and *The History of Ships* by Peter Kemp. In recognition of their valuable voluntary meteorological observational work over many years during their careers at sea, 4 shipmasters were presented with long-service awards in the form of barographs.



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.

FLARE-INDUCED CLOUD FORMATION

North Sea

m.v. *Gardline Locator.* Captain H. J. Morrell. At Brent Oil Field. Observers, the Master and Mr D. P. Hawkins.

28 May 1979. During the evening it was observed that dense cirrus-type clouds were forming from the smoke issuing from the flare of the oil installations, see photograph opposite page 76. The cloud swept downwind for about 2 n. mile then turned 90° to the south.

Position of ship: 60° 18′N, 0° 42′W.

Note. The winds experienced at Lerwick as indicated by the midday radio-sonde ascent were as follows:

Surface, 130° 12 knots
3000 feet, 165° 15 knots
5000 feet, 180° 6 knots
7000 feet, 190° 17 knots
10 000 feet, 195° 21 knots

As may be seen there was a veer of 65°, through south, and this would account for most of the change in direction of the cloud as its height increased.

The Lerwick ascent indicated that cloud would form at 5000 feet with tops rising to 14 000 feet, given a sufficiently high surface temperature to trigger off convection. High temperatures would be reached by the Brent flare and so account for the cloud.

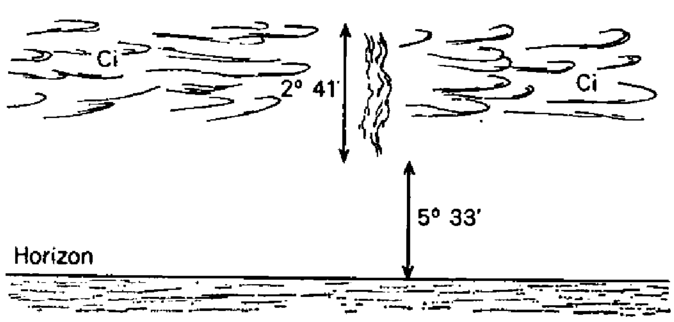
Although Lerwick is some distance from the Brent Field—about 110 n. mile—the winds shown by the ascent are a general indication of those experienced in the Brent Field area.

UNUSUAL CLOUD FORMATION

Eastern North Pacific

m.v. *Anco Challenger*. Captain R. E. Sawers. Balboa to San Francisco. Observer, Mr T. W. Edmunds, 2nd Officer.

15 June 1979. At 1245 GMT an unusual form of cirrus cloud was observed. It was white in colour and appeared similar to a waterspout spiral, see sketch.



At this time the vessel was 120 n. mile south-west of Los Angeles steaming into a gale force 8 north-north-westerly wind and rough seas. There were 3 oktas of hooked cirrus observed at the time lying in a west to east direction across the sky.

The cloud was observed on a bearing of 075 degrees at 1245; at 1315 its bearing was 095 degrees and the formation was beginning to lose its shape. The axis which was vertical when first observed gradually inclined to about 20 degrees from the vertical.

Position of ship: 32° 00°N, 119° 42′W.

CUMULONIMBUS CLOUD

Gulf of Mannar

m.v. *Cape Ortegal*. Captain W. A. Anderson. At anchor Tuticorin (India). Observers, the Master and ship's officers.

24 May 1979. At 1130 GMT, whilst proceeding ashore in a launch, the Master and 7 officers observed a cumulonimbus cloud over the mainland. Photographs of the cloud were taken by Mr E. Moffat, the 3rd Engineer, and one is reproduced opposite page 77.

Closer inspection revealed rays of sunlight which disappeared behind the cloud. Of particular interest was the coloured edging of the striated part of the cloud—this was predominantly red but other colours were also seen to the left of the striations. The cloud eventually moved away inland.

Position of ship: 8° 48′N, 78° 10′E.

WATERSPOUT

Eastern Indian Ocean

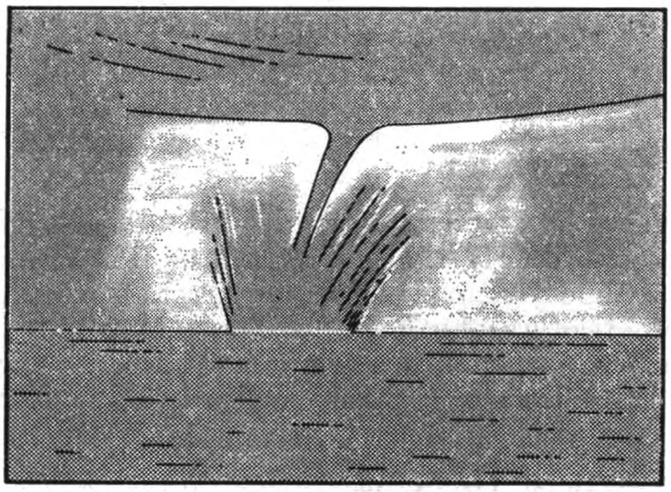
s.s. *Bencruachan*. Captain J. R. Rodger. Djakarta to Jeddah. Observers, the Master, Mr D. Flannagan, 2nd Officer and Mr P. Beaumont.

1 April 1979. At 2330 GMT a waterspout was observed at an approximate distance of 8–10 n. mile, bearing 273°(T). It was seen to reach about three-quarters of the way to the surface of the sea, the lower one-quarter being obscured by spray; it was observed for a period of 6 minutes. The speed and direction of rotation could not be estimated but its maximum diameter was estimated to be 9 metres. Two waterspouts, smaller in diameter, were also observed at an approximate distance of 12 n. mile, bearing 190°(T).

Other weather conditions at the time were: dry bulb 28·6°C, wet bulb 26·6, sea temp. 29·3, barometric pressure 1007·9 mb and wind N, force 2.

Position of ship: 5° 29′S, 103° 25′E.

Note. Waterspouts form under the lower surface of a heavy cumulonimbus cloud. A funnel-shaped cloud appears stretching downwards towards the sea. Beneath this cloud the water appears agitated and a cloud of spray forms. The funnel-shaped cloud descends until it dips into this spray cloud, as illustrated in the sketch, it then assumes the shape of a column stretching from sea to cloud.



The diameter of a waterspout may vary from about one metre to over 100 metres. The height, from the sea to the base of the cloud, may be as little as 50 metres, but is usually about 300 to 600 metres.

A waterspout may last from 10 minutes to half an hour. It travels quite slowly and its upper part often travels at a different speed from its base so that it becomes oblique or bent. It finally becomes attenuated and the column breaks at about one-third of its height from the base, after which it quickly disappears.

CURRENT RIP

North Atlantic Ocean

m.v. *Act 7*. Captain D. M. McPhail. Lyttelton (NZ) to Tilbury. Observer, Mr C. Law, 2nd Officer.

30 June 1979. At 0545 GMT a distinct current rip was observed lying in an east to west direction with sinusoidal curves at least one metre long about every 100 metres. The vessel's head was 020°(T) but on passing through the rip, a deviation of 6° to starboard was noted.

Weather conditions were: dry bulb 25·8°C, wet bulb 23·6, barometric pressure 1014·9 mb, wind SSE, force 3–4, slight sea and low swell.

Position of ship: 1° 58′N, 30° 55′W.

Note. The area from which this report has come lies on the northern edge of the west-going South Equatorial Current. To the north of this boundary the currents are rather variable but generally set between north-west and south-west. During the months May, June and July, however, they fairly frequently set to the east and this is probably the case in this instance. The 2 opposing currents converging would cause a rip.

Bali Sea

m.v. *Nordic Breeze*. Captain R. H. Fletcher. Singapore to Darwin. Observer, Mr C. D. Metson, 2nd Officer.

27 April 1979. At 0445 GMT a strong current rip stretching from horizon to horizon was encountered; the phenomenon was made up of alternate areas of current rips and of calm waters. A considerable swell from the south was also observed. The rips, which were clearly seen on the radar screen, caused the vessel to swing off course by as much as 8 to 9 degrees, the swings were corrected by hand steering.

Some 25 minutes after negotiating this area of rips several more rips and some small eddies were encountered; they became more frequent as the vessel neared the 100 fathom line and continued for a period of 40 minutes as the vessel rounded the southern tip of Lombok Island.

Position of ship: 8° 36′S, 115° 46′E.

Note. The following is an extract from the *Indonesian Pilot,* (N.P. 34):

Tidal streams in Selat Lombok have a semi-diurnal character but are influenced by the currents north of the strait and in the Flores Sea, produced by the monsoons, so that in the strength of the south-east monsoon a predominating south-going stream may be expected and in the north-west monsoon a predominating north-going stream may be expected. There is insufficient information available to give full particulars of the rate and direction of the tidal streams.

In the narrows of Selat Lombok between Nusa Penida and Lombok the stream is stronger, attaining at times a rate of 6 knots, than in the wider northern part where it has a maximum rate of 3½ knots, and the direction is more south and north than elsewhere.

Strong overfalls and eddies may be encountered in both the south and north entrances to Selat Lombok at any time. There is often a turbulent sea south of the narrows and the tidal streams are felt far outside.

Considerable variations in the directions of the tidal streams may be expected north-east of Selat Badung off Labuan Amuk and there are often eddies in Pelabuhan Ampenan.

DISCOLOURED WATER

Eastern North Atlantic

m.v. *Timaru Star*. Captain A. J. Chivers. Rotterdam to Port Elizabeth. Observers, the Master and Mr J. D. Willis-Richards, 2nd Officer.

12 April 1979. At 1530 GMT the vessel passed through several large patches of blood-red water, each patch extending for half a nautical mile in a south-westerly direction.

A sample of the water was taken and found to contain a high density of small red particles and 2 very small black creatures about 0·25 mm in diameter. The water sample had a distinct fishy smell to it. The echo-sounder indicated what was thought to be large shoals of fish between the 30- and the 60-fathom mark. Several hammer-head sharks were also observed at this time.

Weather conditions were: dry bulb temp. 19·5°C, wet bulb 15·5, sea temp. 22, barometric pressure 1016·3 mb, wind ENE, force 3, sea slight, low swell, few clouds, fine and clear.

Position of ship: 24° 01'N, 16° 53'W.

Note 1. The north-west coast of Africa is one of the regions of the world where upwelling of cool sub-surface water occurs. The effect of the north-east trade winds and the rotation of the earth results in a continuous movement of the topmost layers of the sea away from the coast. This movement is compensated for by the upwelling of cool waters from below.

The relatively cool water being carried south by the Canary Current is further cooled by the upwelling. There is a marked southerly trend of the sea-surface temperature isotherms off this coast.

Upwelling plays an important part in the food chain of the sea. The rising water brings to the surface nutrients for the life which abounds in such areas.

Note 2. The following is an extract from the *Marine Observer's Handbook:*

When the plankton is very dense, the colour of the organisms themselves may discolour the sea, giving it a more or less intense brown or red colour. The Red Sea, Gulf of California, the region of the Peru Current, South African waters and the Malabar Coast of India are particularly liable to this, seasonally.

Eastern South Pacific

m.v. *Kinpurnie Castle*. Captain L. H. Bainton. Panama to Valparaiso. Observers, Mr N. Bennett, 2nd Officer, Mr T. Martel, Radio Officer and Cadet H. Robertson.

31 May 1979. At 1830 GMT large patches of red water were observed on the horizon. The patches which ran in a south-south-west to north-north-easterly direction were thought to be made up of plankton. When the vessel steamed through the patches the bow wave was observed to change to a blood-red colour.

Shortly before and about 2 hours after the phenomenon was observed a large number of Manta rays was seen basking and leaping clear of the surface of the sea. Groups of birds, porpoises, cuttlefish, sharks and a solitary Killer whale were also observed during this period.

Weather conditions at the time of the observation were: dry bulb 24·1°C, sea temp 23·9, barometric pressure 1014·9 mb, wind SSW, force 3.

Position of ship 1° 57'S, 81° 23'W.

Note. Dr F. Evans of the Dove Marine Laboratory, University of Newcastle upon Tyne, comments:

'The red colour was the pigment of certain species of plant plankton which, on occasion, grows explosively to produce the phenomenon known as "red tide". This happens in water which, perhaps because of upwelling, has recently become rich in nutrients. After a time many kinds of marine life begin to congregate amongst the plentiful food supply, either feeding directly on the microscopic plants or taking a predatory position higher up the food chain, hence the great variety of marine life in this report.'

WHALES

Western North Atlantic

m.v. *Atlantic Conveyor*. Captain C. P. Margeson. New York to Le Havre. Observer, Mr D. W. Unsworth, 2nd Officer.

19 May 1979. At 1845 GMT a dead whale was sighted close to the vessel, it was floating left side uppermost with the fin and a small part of the body clear of the water. The back was blue and black in colour and the belly white with longitudinal ribbing. It was estimated to be 2½ metres long.

Position of ship: 40° 35′N, 66° 20′W.

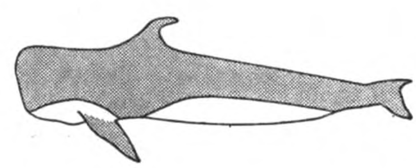
Note. Mr D. A. McBrearty of the Department of Anatomy, University of Cambridge, comments:

'A newly born Blue whale, *Balaenoptera musculus*, is approximately 8 metres long and may weight over 2 tons. Whether this was an aborted foetus is debatable and the species even more so, as even the darker coloured Fin whales do not acquire all their skin pigment until they reach just over one metre of foetal growth. What can be certain is that with longitudinal ribbing visible the animal was quite definitely a rorqual.'

Strait of Gibraltar

m.v. *Taupo*. Captain C. B. Cooke. New York to Valencia. Observer, Mr R. G. Flynn, 3rd Officer.

28 June 1979. At 1030 GMT 10 Pilot whales, see illustration by Mr Flynn, were observed passing close to the vessel and heading in a southerly direction. They were estimated to be 8 metres in length.



Position of ship: 35° 55′N, 5° 46′W.

Note. Mr McBrearty comments:

'The sketch is a representation of a Northern Pilot whale, *Globicephala melaena;* other common names are Blackfish, Pothead, Long-finned Pilot whale and Caa'ing whale (nothing to do with calling, it is a Norse word and refers to herding).

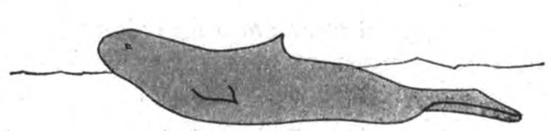
'The large bulbous head of the adult is a characteristic of this animal. The colour of *Globicephala melaena* is usually black on the back and sides with a white heart-shaped throat patch extending down the mid line to the uro-genital slit. The amount of white may vary in individuals as may also the occasional presence of a greyish saddle patch.

'There is another similar whale in the North Atlantic—the short-finned Pilot whale, *Globicephala macrorhynchus*. This, as the name implies, has a shorter fore-limb. It is smaller (less than 5½ metres) than *Globicephala maleana* and is more often confined to the tropical Atlantic.'

Eastern North Pacific

m.v. *Columbia Star*. Captain T. D. Brewster. Los Anglees to Balboa. Observers, Mr J. Clayton, 2nd Officer and Mr N. MacDonald, 3rd Officer.

13 June 1979. At 2030 GMT several large schools of dark coloured whales, see sketch, were observed; the animals varied in length from 2 to 6 metres. They were at



first thought to be porpoises; this was, however, ruled out after observing their lackadaisical basking behaviour and noting their size.

Position of ship: 10° 13′N, 87° 39′W.

Note. Mr McBrearty comments:

'This is an excellent drawing of a Pygmy Sperm whale, *Kogia breviceps*. The recognition characteristics of this small whale are the small rounded head with undershot lower jaw, small dorsal fin and dark steel-grey colouration. The maximum size of *Kogia* is about 3·4 metres. The observer has given an upper limit of 6 metres, this could be a mistake but the sketch and description of the behaviour is too much like *Kogia breviceps*. The only other possibility is the False Killer whale, *Pseudorca crassidens*.'

Eastern South Atlantic

m.v. *Resolution Bay*. Captain L. E. Howell. Rotterdam to Melbourne. Observers, the Master and Mr S. E. Bligh, 2nd Officer.

2 April 1979. At 1530 GMT a small number of whales, about 15 in number, were observed lying quietly on the surface close to the vessel. They were in groups of 3 or 4 and were clearly identified as Sperm whales by their squarish heads and the forward slant of the 'blow'.

Position of ship: 11° 30′S, 0° 36′W.

Note. Mr McBrearty comments:

'The South Atlantic is an area where Sperm whales may be observed almost all the year round. It is believed that these concentrations are not a separate stock but that they represent the northern population on winter grounds from October to March and a southern population on winter grounds from April to September. Therefore, these animals seen by the observer would probably have come up from the Southern Ocean. No size is indicated in the report but breeding and birth does take place in temperate waters and the group probably was composed mostly of females, one or two calves and no more than one or two bulls.'

DOLPHINS

North Pacific Ocean

m.v. *Anco Challenger*. Captain R. E. Sawers. San Francisco to Kashsiun (Taiwan). Observer, Cadet N. W. Wymer.

20 June 1979. At 0630 GMT a school of Bottlenose dolphins, about 35 in number was sighted on the starboard bow. Some moved ahead of the vessel whilst others dropped back to play in the bow wave. A fairly tight formation was kept with most of those ahead of the vessel moving in a straight line. They stayed with us for about 10 minutes then swam away, still retaining their formation, in a north-north-westerly direction.

Position of ship: 34° 46′N, 146° 53′W.

Note. Mr McBrearty comments:

'These Bottlenose dolphins are probably *Tursiops truncatus*. There would appear to be 2 forms of this species—a large one generally found in cooler waters and a smaller animal more often seen in warmer or tropical waters. The larger form is said to grow as large as 3·7 metres, the average adult size is 3 metres.

'The Bottlenose dolphin is the animal most commonly kept in European Marinelands. It is "Flipper" of television fame and is almost instantly recognized as "the dolphin" by the public at large. It feeds on most kinds of fish, small octopus and shrimps. It adapts better than most small cetaceans to captivity and is, therefore, a popular zoo specimen.'

MARINE LIFE

Eastern North Atlantic

m.v. *Blenheim*. Captain D. Keighley. London to Funchal (Madeira). Observers, Mr G. Gwyther, Chief Officer and Mr H. Russell.

15 April 1979. At 0715 GMT the vessel passed through large patches of what at first appeared to be scum or froth. Closer inspection, however, revealed that the patches were made up of transparent sacs each about 4 centimetres in diameter. They were thought to be the spawn of jelly-fish such as Portuguese men-o'-war. The patches, which varied considerably in density, extended over an area of at least 5 n. mile.

Position of ship: 38° 45'N, 12° 32'W.

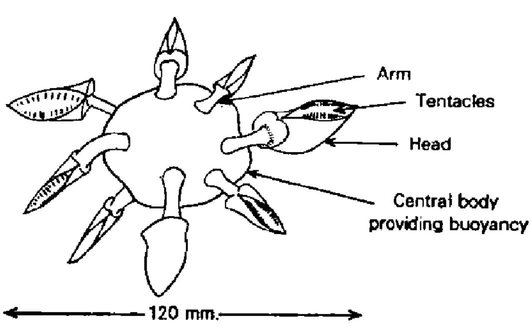
Note. Dr F. Evans of the Dove Marine Laboratory, University of Newcastle upon Tyne, comments:

'One thing is sure about this puzzling observation, the objects were not the spawn of jelly-fish—this is far too small. It seems more likely that they were small jelly-fish, or, more precisely, small Portuguese men-o'-war. Portuguese men-o'-war are almost microscopically small at first although they appear to grow very rapidly. When an inch or two long I have heard them called "bluebottles" and it may have been this stage of development the observers saw. The aggregation in patches is common for such marine life but is particularly characteristic of animals such as these which live at the surface.'

Eastern North Atlantic

s.s. *Pollenger*. Captain J. R. McMurtry. Boston to Gibraltar. Observers, the Master and ship's company.

10 June 1979. For the past 3 days sightings have been made of small white objects, see sketch and photograph opposite page 76.



One such object was taken from the sea and was found to consist of a central spongy white body—the source of buoyancy; the body was similar in texture to polyurethane foam. From the central body 8 'arms' protruded; at the end of each arm was a 'case'—each 'case' containing a set of tentacles. The case was approximately 60 mm in length and purple white in colour with dark-brown markings. The tentacles were in pairs and extended to a length of approximately 20 mm. The 'arms' were flexible. There was evidence of several decayed arms and tentacle cases.

The organism apparently fed on microscopic life within the sea as after several hours in the bucket the tentacles had to work continuously to maintain it. It was stimulated by light. The whole organism, which was approximately 120 mm in length, could not propel itself in any way.

Position of ship at 1830 GMT: 38° 25'N, 17° 49'W.

Note. Dr Evans comments:

'I especially applaud this observation. The fact that the author's conclusions are in error in no way detracts from a well-observed account.

'The organism was not in fact singular but consisted of a colony of stalked barnacles of the genus *Lepas*. The particular species captured, *Lepas fascicularis*, secretes its own float instead of depending on other floating objects such as wood or cuttle bones.

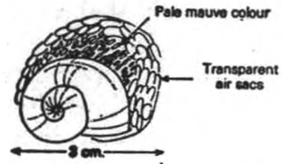
'Charles Darwin, in his vast monograph on the barnacles, cites seamen's descriptions of the secreted floats as birds' eggs. Polyurethane foam is as good a fit, but in truth, as Darwin stated, the float is a vesicular membranous mass produced by the living colony.'

SNAILS

Eastern North Atlantic

m.v. *Wiltshire*. Captain P. Bytheway. Falmouth to Salvador. Observers, the Master and ship's company.

15 May 1979. At 1030 GMT large areas of many hundreds of small semi-transparent molluscs, see sketch, were observed in the vicinity of the vessel; the molluscs appeared to be encased in a colourless jelly-like substance.



Samples of the creatures brought on board emitted an indigo-coloured dye. The specimens lived for about 24 hours and, once dead, they detached themselves from the sacs and sank to the bottom of the bucket.

Position of ship: 33° 18′N, 15° 06′W

Note. Dr Evans comments:

'The snails were specimens of the genus *Ianthina* and were, most likely, *Ianthina exigua*.

'All *Ianthina* produce bubble floats which are strong and difficult to puncture. *Ianthina exigua* characteristically attaches egg capsules to a band of mucus on the underside of the float. The reason for the float is that the snails prey on the By-the-wind-sailor, Vellela, which is also a surface dweller. It is interesting that both predator and prey are coloured blue for camouflage (not from each other though for both are effectively blind). When eating Velella, *Ianthina* may abandon its float and rely on Velella's buoyancy. The snail exudes a purple dye at this time which appears to act as an anaesthetic, enabling it to browse upon its victim without resistance.'

PORTUGUESE MAN O' WAR

Eastern South Atlantic

m.v. *Amastra*. Captain M. T. John. Curaçao to Cape Town. Observers, the Master and ship's company.

20 April 1979. Whilst the vessel was stopped for engine repairs, small creatures were observed floating down the lee side. One was brought on board in a bucket and found to be a type of jelly with an air-filled sac running along its length. A number of trailing tendrils, blue in colour, hung down in the water, see photograph opposite page 77.

Position of ship: 32° 49′S, 15° 16′E.

Note. Dr Evans comments:

'The animal in the photograph is a small Portuguese man o' war, *Physalia*, these animals are sometimes called bluebottles.

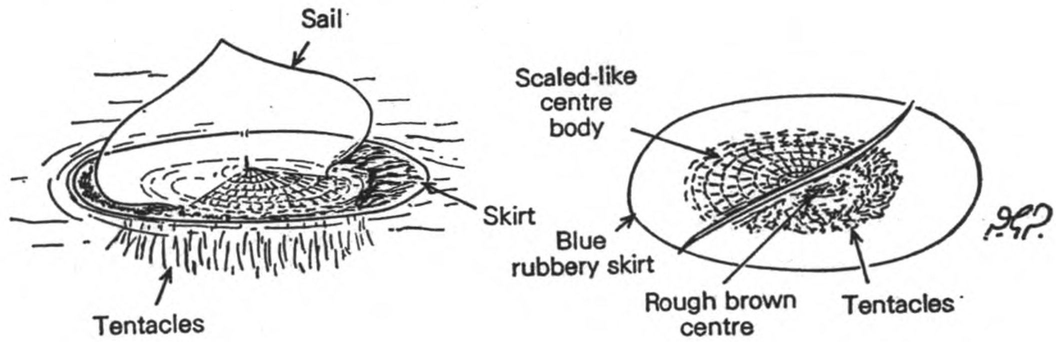
'*Physalia* is a jelly-fish modified to float at the surface by means of a gas bladder. It lives carnivorously, killing its prey by stinging and its sting is very painful—rather like a multiple cigarette burn—an unfortunate friend once told me.'

VELELLA

Eastern North Atlantic

m.v. *Singularity*. Captain A. J. A. Richards. Belem (Brazil) to Heysham. Observer, Mr P. G. Powell, Chief Officer.

3 May 1979. Between 1000 and 1600 GMT a large number of Velella were observed, see sketches.



The creatures varied in size from 2 to 5 centimetres. The sail which was completely transparent crossed the body at an angle of about 45 degrees and was shaped like an inverted heart. A royal blue skirt, turned upward to form a dish in the water, surrounded the centre of the creature which itself was hard and clear and took on a scaled appearance. Underneath, short tentacles extended from the hard central body.

Throughout the period the creatures numbered in density about 15 per square metre, it was also noted that the larger specimens were observed at first and the smaller specimens later in the day. One of the specimens washed on board in the spray had a small barnacle-type creature attached to its under-part. It was thought that the Velella may have been feeding on the smaller creature.

Position of ship at 1000: 39° 40′N, 18° 48′W.

North Pacific Ocean

m.v. *Menelaus*. Captain G. A. W. Fisher. Moji (Japan) to Panama. Observer, Mr S. R. Jenkins, 3rd Officer.

6 May 1979. At 1730 GMT what appeared to be an oil-slick was observed in the distance. Closer inspection revealed a number of jelly-fish-like creatures, see photograph opposite page 77. The creatures were in several large areas, all lying in the direction of the wind.

The numbers were such that they were observed for the last time at 2300 on the 7th and at no time did the concentration fall below 30 per square metre.

Position of ship at 1730 on the 6th: 40° 00′N, 172° 30′W.

Note 1. The *Menelaus* is a Hong Kong Selected ship.

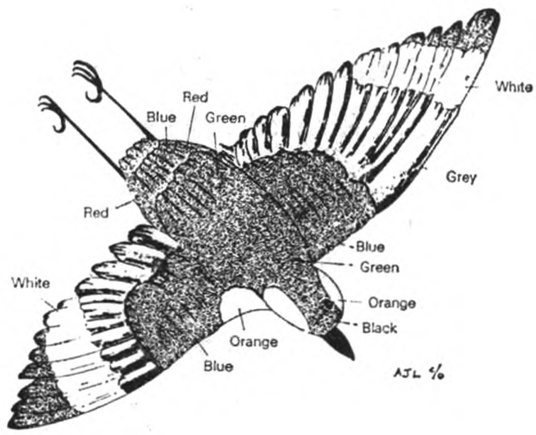
Note 2. Dr. Evans comments:

'These were further examples of the circumtropical By-the-wind-sailor, Velella—a surface-living jelly-fish with a cartilaginous, buoyant sail. This sail grows vertically at an angle to the axis of the body, some animals developing to sail on the starboard tack, others the port tack. This may be a dispersal device.'

BIRDS

Indian Ocean

s.s. *Liverpool Bay*. Captain J. E. Webb. Jeddah to Kobe. Observers, Mr A. J. Leslie, Chief Officer, Mr P. P. van Bergen, 2nd Officer and Cadet R. K. G. Johnson.



20 April 1979. At 0000 GMT after a night of strong winds and frequent rain showers, the bird, shown in the sketch, was found dead on the wing of the bridge; another similar bird was found later on the after-deck. The colours of the plumage were brilliant and the green appeared iridescent. It was 18 centimetres long, 6½ centimetres wide and had a wing-span of 33 centimetres.

It was thought the birds had been blown on board and that they had come from the northern coast of Sumatra.

Position of ship: 5° 48′N, 96° 18′E.

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

'This is the Hooded Pitta, *Pitta sordida*. There are 23 species in the world, 12 of which are to be found in south-east Asia. The bird usually stays in the undergrowth and runs when alarmed. It is secretive and, therefore, difficult to observe.'

North Pacific Ocean

m.v. *Barcelona*. Captain P. St. Q. Beadon. Yokohama to Long Beach. Observers, the Master and officers of the watch.

20 June 1979. At 0300 GMT 4 albatrosses were observed following the vessel, a photograph of one of the birds was taken and appears opposite page 84.

Three of the birds were brown with white lower parts and a single spot on the rear; the fourth was similar in colour to that of a seagull. The birds flew around the vessel 'buzzing' the bridge every few minutes.

Position of ship: 43° 55′N, 158° 53′ E.

Note. Captain Tuck comments:

'This is a young Black-footed Albatross, *Diomedea nigripes*. The adult has a sooty-brown area around the bill and behind and below the eyes. The bill is reddish brown and the feet black. Young birds are similar except that the area around the bill is whiter and the rump and upper tail-coverts are white or mottled with brown. Its range is the North Pacific Ocean.'

North Atlantic Ocean

m.v. *Singularity*. Captain A. J. A. Richards. Belem (Brazil) to Heysham. Observers, the Master, Mr P. G. Powell, Chief Officer and Mr D. Nichols, Chief Engineer.

2 May 1979. At 2000 GMT a Kestrel, see sketch, was observed on a platform at the top of one of the vessel's deck cranes. After a short while it flew around the vessel for a period of about half an hour before coming to rest, presumably for the night, on another crane.

The bird's back was mainly light brown with dark specks but more of a reddish brown with dark-brown spots between the wings. The dark-brown tail appeared to

have reddish-brown bands across it and the legs and talons were light orange. The breast was white with dark-brown spots, the beak light orange, a white patch was also observed below the eyes and beak. The centre of the head was greyish brown and there were dark-brown stripes stretching down the neck.

On the following morning the bird continued to fly around the vessel perching on different parts for short periods—its favourite resting place seemed to be on top of the driver's cab of the middle crane. Around mid-morning a piece of raw steak was placed on top of this cab and very soon the Kestrel was seen feeding on it.

On the third morning the bird was found sheltering from the wind and rain on the lee side of one of the cranes. Later during the morning it took off again and after a few minutes flew away.

Position of ship at 2000 on the 2nd: 37° 25′N, 20° 33′W.

Gulf of Venezuela

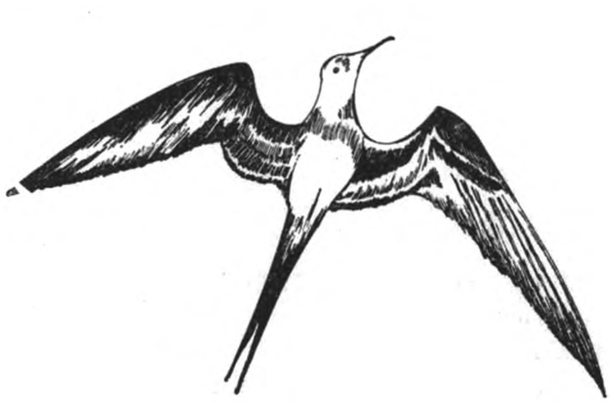
m.v. *Tactician*. Captain H. Traynor. At anchor, Maracaibo. Observers, Mrs A. Mathison, wife of Chief Officer and Cadet S. Riddiough.

13 May 1979. During the day a group of 7 Brown Pelicans flying and diving around Maracaibo Anchorage and varying numbers of Magnificent Frigate-birds flying high in the sky were observed. Two of the Frigate-birds descended to a lower level to chase gulls carrying food.

Sketches of the birds were made by Cadet Riddiough and are shown below. Frigate-bird on the left and Pelican on the right.

Position of ship: 10° 40′N, 71° 37′W.

Note. The Magnificent Frigate-bird, *Fregata magnificens* is the largest of the 5 species having a wing-span of up to 250 cm. It occurs along the coasts of tropical America and in the South Atlantic.

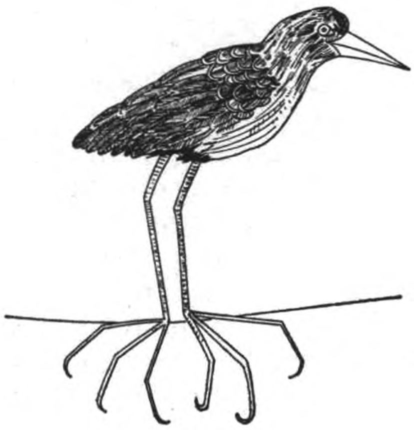


The Brown Pelican, *Pelecanus occidentalis*, is the smallest of the Pelicans measuring 110 cm and having a wing-span of 230 cm. It is the only pelican which catches fish by plunging down from the air. It nests where fish are to be found in abundance in order to satisfy the requirements of its young. The Brown Pelican is a valuable source of guana in Peru.

South Atlantic Ocean

m.v. *Sugela*. Captain A. Grant. Durban to Gramercy (Louisiana). Observers, the Master, Mr R. W. Wells, Chief Officer and Mr Solomons, Boatswain.

21 May 1979. At 0800 GMT the bird shown in the sketch was observed to be clinging to the starboard engine room ventilator. Mr Solomons managed to catch it and took it to the Chief Officer's wife who kept it in the accommodation; it would take only water.



The bird's overall colouring was a dark olive-green and, in the sunlight, highlights of green and yellow could be clearly seen. The feet seemed to be very large for the size of the body. There was a diamond shape with a leathery appearance over the beak.

At about 1300 the bird had obviously recovered as it began scratching at the porthole trying to get out. When it was released it flew off but was still in a weak state as it suddenly lost height and dropped into the sea.

Position of ship: 22° 42′s, 1° 42′w.

Note. Captain Tuck comments:

'I consider this to be the African Jacana, *Actophilornis africanus*.

'The sub-adult plumage has uppermost parts tinged with a yellowish green as opposed to the full-adult plumage of dark chestnut. Above and behind the bill is a bluish-white frontal shield, somewhat inconspicuous.

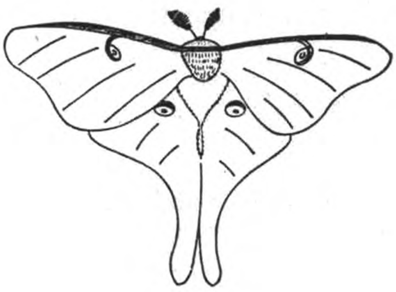
'The bird is commonly known as a Lily-trotter because of its habit of walking freely on floating lily-pads and other aquatic vegetation found in stagnant pools and quiet rivers with its extremely long toes. It is not normally seen so far out to sea but is quoted as being a powerful flier with its extremely long legs fully extended in flight.'

MOTH

Western North Atlantic

m.v. *Yorkshire*. Captain W. A. D. Davies. At anchor, Bigstone Beach Anchorage, Delaware River. Observers, Mr D. Jenkinson and Mr A. G. Thelwell, 2nd Officers and Mr W. J. M. Hargreaves, 3rd Officer.

15 June 1979. A large moth, see sketch, was found on the main deck.



The creature measured 134 mm, wing-tip to wing-tip, 95 mm from antennae to tail and had a body length of 23 mm. The upper parts of the wings were lime green in colour except for about 3 mm of the leading edges which were a purple brown. Four 'eyes' on the wings were coloured a deeper green and were white at the centre; the forward section of each 'eye' was also a purple brown. The lower part of the wings were completely green. The body was white and furry; there was a patch of yellow fur at the back of the head. The legs were brown and proboscis and antennae a golden colour.

When found the moth was very quiet and thought to be dying, but after about an hour it began to show signs of life. A spoon containing a few drops of milk were placed in front of it and some time later it was seen to be standing on the rim of the spoon, perhaps having taken a drink. About 3 hours later it flew off.

Position of ship: 37° 54′N, 73° 24′W.

Note. Mr A. Watson of the Department of Entomology, British Museum (Natural History), comments:

'The drawing depicts a Moon moth or Luna moth, *Actias luna* L. This is a fairly common, though never-the-less very beautiful species found in eastern Canada and the United States. It belongs to the same family of moths as our British Emperor moth.'

BIOLUMINESCENCE

Eastern North Atlantic

m.v. *British Tamar*. Captain W. A. M. Hare. Okrika (Nigeria) to Milazzo (Sicily). Observer, Mr J. Swanson, 2nd Officer.

15 April 1979. At 0100 GMT the vessel passed through an area of bioluminescence and a sample of the water was taken in the sea temperature bucket.

When the sample was agitated small spots of luminescence were seen in the water and when observed under a magnifying glass they appeared to be small dark specks. Although the specks could still be seen 2 hours later, vigorous shaking had no effect and bioluminescence was no longer observed. A light directed onto the sample also produced no effect.

The sea temperature at the time was 22·0°C, the wind was calm and there was a northerly swell.

Position of ship: 12° 20′N, 18° 00′W.

Note. Dr P. J. Herring of the Institute of Oceanographic Sciences, comments:

'This sounds like dinoflagellate luminescence. Specimens of some of the larger species, e.g. *Noctiluca*, in a jar of water would give just this appearance.'

Western South Atlantic

m.v. *Gandara*. Captain R. B. Bailey. Donaldsonville (Louisiana) to Rio Grande (Brazil). Observers, Mr C. W. Raymond, 2nd Officer and Mr Q. Ghulam.

21 June 1979. At 0600 GMT when the Aldis lamp was directed onto the water in order to ascertain the state of sea, bright reflections of white, yellow and red coloured lights were observed. The distribution was not dense, the flashes were in

some cases up to 10 metres apart. When the Aldis lamp was turned off no other effects were observed.

Position of ship: 26° 12′S, 44° 54′W.

Note. Dr Herring comments:

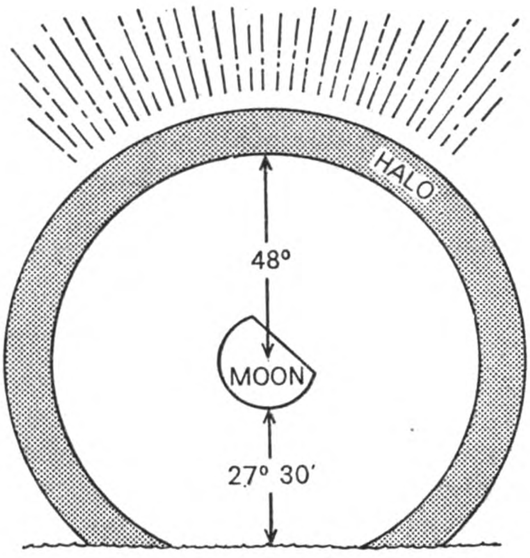
'Reflective animals do occur at the surface and the account could be interpreted as reflections from small copepods, *Sapphirina*, or even small silvery fishes. Alternatively the eyes of many lantern-fish are very reflective and could produce a similar appearance.'

LUNAR HALO

North Pacific Ocean

m.v. *Pacific Fisher*. Captain I. J. Groundwater. Pearl Harbour to Panama. Observers, Mr J. Ross, 2nd Officer and Mr P. Reed.

15 June 1979. At 0915 GMT a halo of approximately 48° was observed around the moon, altitude 27° 30′, on a bearing of 105°(T), see sketch. The uppermost part of the halo appeared to illuminate cirrus-type cloud which was not visible elsewhere in the sky and to give the cloud a light blue/green colour; the illumination extended over 90° away from the halo fading gradually as its distance from the light source increased. The phenomenon was visible for about 15 minutes.



Weather conditions at the time of the observation were: dry bulb 27·0°C, wet bulb 24·9, barometric pressure 1012·1 mb. Weather conditions during the previous 12 hours had been cloudy with frequent heavy rain showers and wind E to NE, force 3–4.

Position of ship: 7° 06′N, 131° 32′W.

Note 1. The following are extracts from the *Meteorological Glossary:*

The most common halo is a luminous ring of 22° radius surrounding the sun or moon. The ring, if faint, is white but if more strongly developed the inner edge is pure red, outside which yellow may be detected. The angle of 22° is the angle of minimum deviation for light passing through a prism of ice with faces inclined to 60°. Alternate faces of a hexagonal prism are inclined at this angle and as hexagonal prisms are frequently found among ice crystals, the halo is probably due to the refraction of light through such prisms.

Note 2. A halo with an approximate radius of 48° as reported by the observers from the *Pacific Fisher* is seen only occasionally and seldom complete. It requires crystals with faces at right angles.

BROCKEN SPECTRE AND GLORY

Western South Pacific

m.v. *Resolution Bay*. Captain L. E. Howell. Port Chalmers (NZ) to Flushing. Observer, the Master.

14 May 1979. At 2200 GMT during periods of fog the Brocken Spectre and Glory were frequently observed; the shadow of the observer and a part of the bridge-wing were clearly seen against the fog.

Small coloured rings of orange, red and green with a bright, almost complete, halo, mainly white but with a faint dull red and green inner edge, were observed around the head of the observer. Between the glory and the outer halo were faint coloured rings of red, green, violet and blue.

Weather conditions at the time of the observation were: dry bulb 10·4°C, wet bulb 10·0, sea temp. 8·0. The sun's altitude was 22° 17′.

Position of ship: 49° 02′S, 143° 26′W.

Note. The following are extracts from the *Meteorological Glossary:*

When an observer stands on a hill partially enveloped in mist and in such a position that his shadow is thrown on to the mist, he may get the illusion that the shadow is a person seen dimly through the mist. The illusion that this person or 'spectre' is at a considerable distance is accompanied by the illusion that he is gigantic. The Brocken is a mountain in Germany.

The system of coloured rings similar to those of a corona round sun or moon, surrounding the shadow of an observer's head on a bank of cloud or mist is the phenomenon known as glory, it is also termed 'anticorona'. A several-fold effect is sometimes observed, whilst a fogbow may be seen to surround a glory.

When light passes through circular holes in an opaque screen, colours are produced by diffraction. If little mirrors, all facing the sun, could be substituted for the droplets in a cloud, the light from each mirror would behave as if it came through a hole from the reflection of the sun and similar diffraction colours would occur. The action of the drops is probably analogous. The mathematical theory developed by B. Ray is on these lines. Earlier writers had supposed that the phenomena were produced by the diffraction, by particles comparatively near the surface, of light reflected from deeper portions of the fog or cloud.

ZODIACAL LIGHT

Eastern North Atlantic

m.v. *Summity*. Captain W. G. Hunt. Venice to Limerick. Observers, the Master, Mr A. MacIntyre, Chief Officer, Mr T. H. Withers, 2nd Officer and Mr R. Daniell.

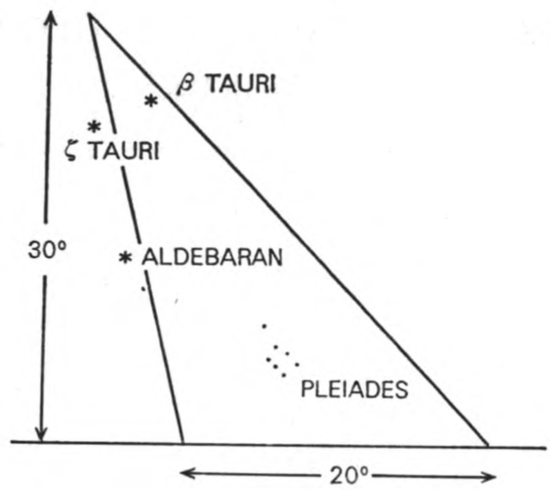
19–21 April 1979. On 3 consecutive days the phenomenon zodiacal light was observed and the following are extracts from the vessel's meteorological logbook:

Between 2100 and 2200 GMT on the 19th a cone of zodiacal light was observed on a bearing of 296°(T). It was difficult to estimate the brightness of the phenomenon as it was dead ahead of the vessel and was dimmed by the loom of the foremast light.

Dry bulb temp. 16·9°C, wet bulb 15·0, barometric pressure 1021·2 mb.

Between 2030 and 2300 on the 20th the phenomenon was again observed, the brightness was such that the Pleiades, observed in the centre of the cone, see sketch, appeared as a faint nebulae to the naked eye; individual stars could be seen clearly only through binoculars.

From 2100 until obscured by cloud at 2200 on the 21st zodiacal light was observed once again.



Dry bulb temp. 12·9, wet bulb 12·4, barometric pressure 1027·8 mb.

Position of ship at 2100 on the 19th: 37° 03′N, 8° 00′W.
Position of ship at 2100 on the 21st: 43° 25′N, 10° 00′W.

Note. Zodiacal light is described in the *Meteorological Glossary* as being a cone of faint white light in the night sky extending along the zodiac from the western horizon after evening twilight and from the eastern horizon before morning twilight.

The phenonemon is caused by the scattering of sunlight from a cloud of particles lying in the ecliptic (the path described by the earth round the sun in the course of a year). The composition and origin of these particles—whether of dust or molecules or electrons, solar or terrestrial—is not yet certain. Molecular emission may also play a part.

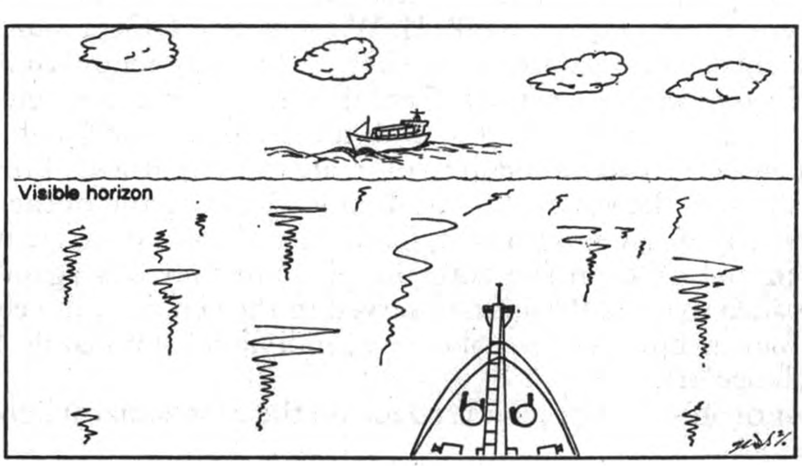
ABNORMAL REFRACTION

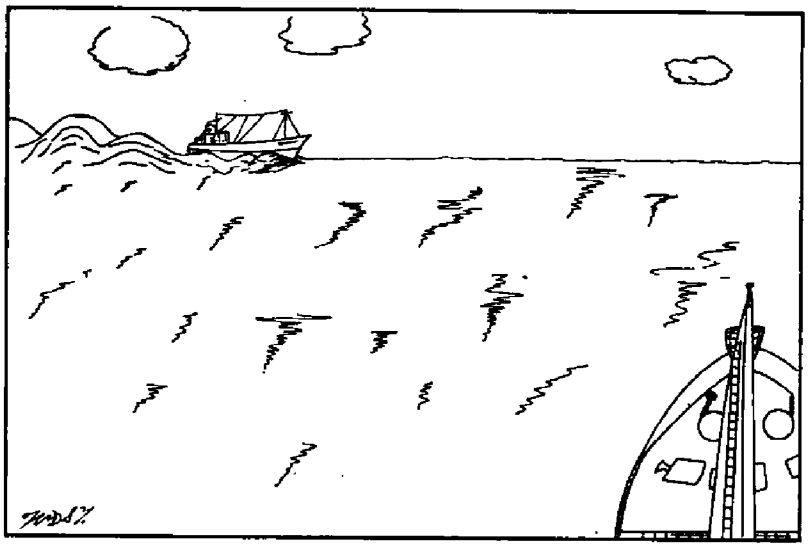
North Sea

s.s. *Esso Warwickshire.* Captain C. C. Jorgensen. Brent Oil Field to Fawley. Observer, Mr K. W. D. Shears, 2nd Officer.

4 April 1979. At 1530 GMT the phenomena illustrated in the upper and lower sketches were observed.

The vessel in the upper sketch was observed fine on the port bow. At a range of 8 n. mile it was seen to be in a normal position on the visible horizon, but when at a range of 12 n. mile it appeared in very clear detail to be in a position above the visible horizon.





At the same time a small fishing vessel, at a range of 9 n. mile and approximately 4 points on the port bow, was producing a wake on the horizon which appeared to the observer as a mountainous sea, see lower sketch. This phenomenon persisted until the range had decreased to 7 n. mile.

The weather at the time of the observation was: dry bulb 5·5°C, wet bulb 3·8, sea temp. 6·3, barometric pressure 1005·3 mb, visibility 15 n. mile, wind calm.

Position of ship: 52° 28′N, 2° 58′E.

The Inter-Governmental Maritime Consultative Organization

(From information kindly supplied by the Information Officer)

When the establishment of a specialized agency of the United Nations concerned solely with maritime affairs was mooted, the main concern was to evolve international machinery to improve safety at sea. This was understandable for two main reasons. In the first place seafaring has always been one of the most dangerous of occupations. In the second place, because of the international nature of the shipping industry, it had long been recognized that action to improve safety in shipping operations would be more effective if carried out at an international level rather than by individual countries acting unilaterally and without co-ordination with others. Although a number of important international agreements had already been adopted, many States agreed that there was the need for a permanent body which would be able to co-ordinate and promote further measures on a more continuing basis. It was against this background that the United Nations Maritime Conference of 1948 adopted the Convention establishing the Inter-Governmental Maritime Consultative Organization (IMCO) as the first ever international body devoted exclusively to maritime matters.

In the 10-year period between the adoption of the Convention and its entry into force in 1958 other problems related to safety but requiring slightly different emphasis had attracted international attention. One of the most important of these was the threat of marine pollution from ships, particularly pollution by oil carried in tankers. An international convention on this subject was actually adopted in 1954, four years before IMCO came into existence and responsibility for administering and promoting this Convention was assumed by IMCO at the very inception of its work in January 1959. Thus from the very beginning the improvement of maritime safety and the prevention of marine pollution have been the most important objectives of IMCO.

The Organization is based at 101–104 Piccadilly, London, and is the only United Nations' specialized agency to have its headquarters in Britain. IMCO's Secretariat has a staff of 270. The governing body of IMCO is the Assembly which meets once every two years and consists of all the Member States. As at 1 June 1979 IMCO had 112 Members plus one Associate Member. In the period between the sessions of the Assembly a Council exercises the functions of the Assembly in running the affairs of the Organization. The Council consists of 24 Member Governments elected for two-year terms by the Assembly.

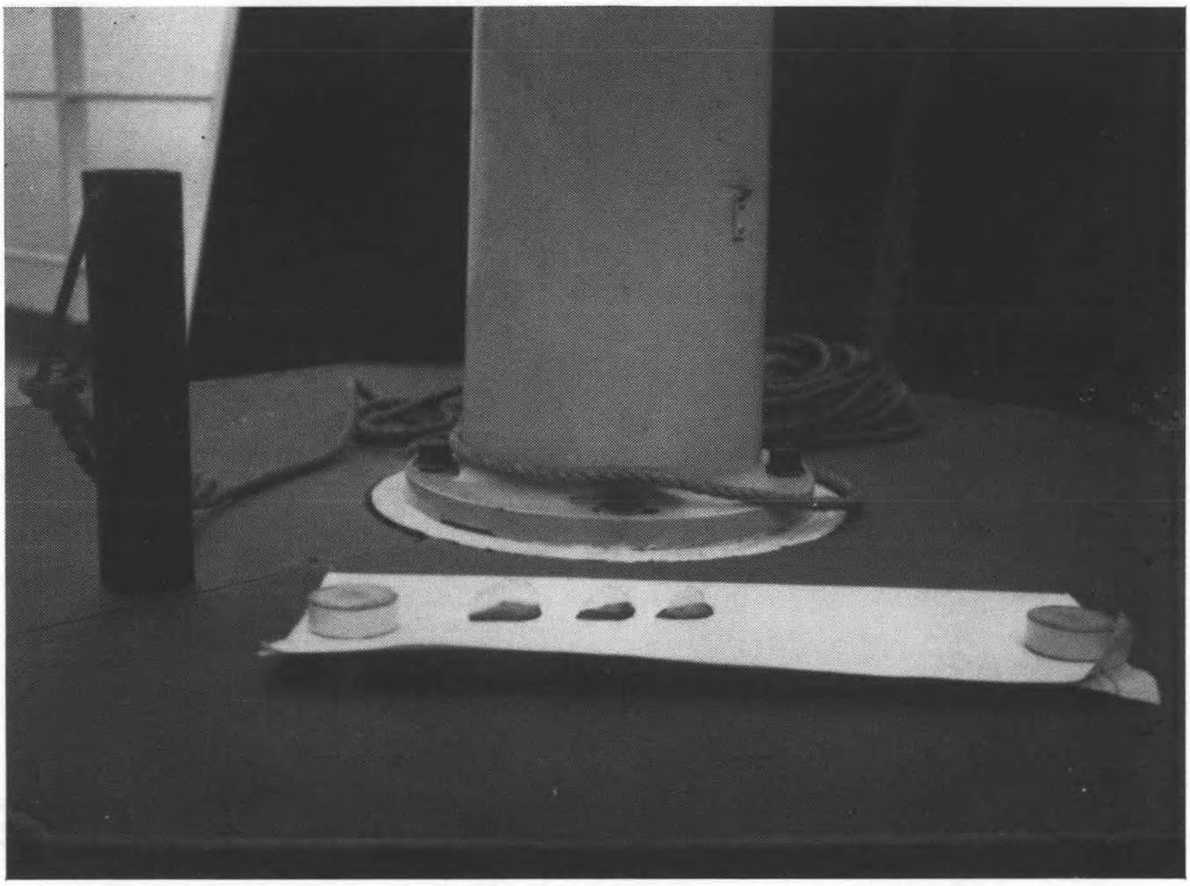
The Organization's technical work is carried out by a number of Committees, the most senior of which is the Maritime Safety Committee. This has a number of Sub-Committees dealing with such matters as navigation, radiocommunications, life-saving appliances, training, search and rescue, ship design and equipment, fire protection, subdivision, stability and load lines, fishing vessels, containers and cargoes, dangerous goods and bulk chemicals. The latter is also a Sub-Committee of the Marine Environment Protection Committee which handles IMCO's anti-pollution activities, other Committees are the Legal Committee, the Committee of Technical Co-operation and the Facilitation Committee.

In order to achieve its objectives IMCO has, in the last 20 years, promoted the adoption of nearly 30 Conventions and adopted a large number of Codes and Recommendations on various matters relating to maritime safety and prevention of pollution. The initial work on a Convention is normally done by a Committee or Sub-Committee; a draft instrument is then produced which is submitted to a Conference to which delegations from all States within the United Nations system—

Flare-induced cloud formation (*see* page 58)

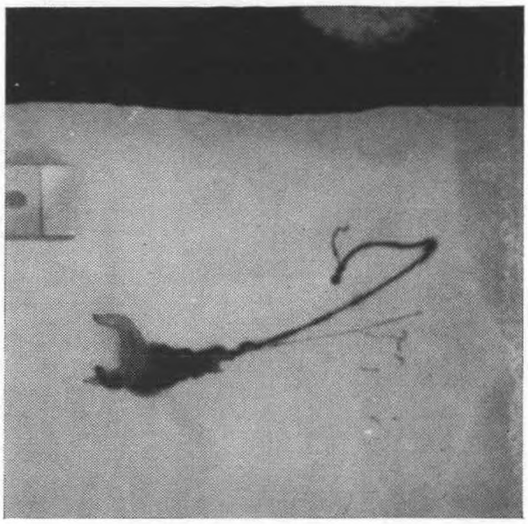
Colony of stalked barnacles (*see* page 65)

opposite page 77



Velella (*see* page 67)

Cumulonimbus cloud (*see* page 59)



Physalia (*see* page 66)

including States which may not be IMCO Members—are invited. The Conference adopts a final text which is submitted to Governments for ratification. An instrument so adopted comes into force after fulfilling certain requirements specified therein which usually includes ratification by a specified number of countries: the more important the Convention the more stringent are the requirements for entry into force. Observance of the requirements of a Convention is mandatory on countries which are parties to it; Codes and Recommendations, on the other hand, are not so binding on Governments. However, their contents can be just as important and in most cases they are implemented by Governments through incorporation into domestic legislation.

Safety

The first conference organized by IMCO in 1960 was, appropriately enough, concerned with safety matters. In 1948 an International Convention on the Safety of Life at Sea had been adopted at a conference convened by the United Kingdom, but developments during the intervening years had made it necessary to bring this up to date without delay.

The 1960 Conference adopted a new International Convention on the Safety of Life at Sea which came into force in 1965. This Convention, which has so far been ratified by nearly 100 countries, covers a wide range of measures designed to improve the safety of shipping. They inculde sub-division and stability, machinery and electrical installations, fire protection, detection and extinction, life-saving appliances, radiotelegraphy and radiotelephony, the safety of navigation, the carriage of grain, the carriage of dangerous goods and nuclear ships. This Safety of Life at Sea Convention—the SOLAS Convention as it is known for short—is the basic international instrument dealing with matters of maritime safety. In response to new developments it has been amended several times since its adoption. However, because of the rather difficult requirements for bringing amendments into force, none of these amendments actually became binding internationally.

To remedy this situation and effect the needed improvements more speedily, IMCO convened in 1974 a conference to adopt a new International Convention on the Safety of Life at Sea which would incorporate the amendments adopted to the 1960 Convention as well as effect other necessary improvements. It was felt that it would be easier to bring the new Convention into force than to secure the acceptances necessary to bring the amendments into force. The new Convention also has a much easier amendment procedure under which amendments would normally come into force on certain predetermined dates, unless a stipulated number of States Parties to the Convention indicate that they object to such amendments.

The 1974 Convention will enter into force on 25 May 1980. In the meantime IMCO was busy promoting other international instruments designed to improve shipping safety. In 1966 a conference adopted the International Convention on Load Lines. Limitations on the draught to which a ship may be loaded, in the form of freeboards, are an important contribution to its safety. An international Convention on this subject had been adopted in 1930 and the new instrument brought this up to date and incorporated new and improved measures. It came into force in 1968.

The system of tonnage measurement of ships can also affect safety and this has been one of the most difficult problems in all maritime legislation. Tonnage is used for assessing dues and taxes and because of the way in which it is calculated it has proved possible to manipulate the design of ships in such a way as to reduce the ship's tonnage while still allowing it to carry the same amount of cargo, but this has occasionally been at the expense of the vessel's stability and safety.

Several systems of tonnage measurement were in existence but none of them was universally recognized. IMCO began work on this subject soon after coming into being and in 1969 the first ever International Convention on the subject was adopted. It is an indication of the complexity and controversial nature of this aspect that the Convention, which has a very high requirement for entry into force (25 States with not less than 65 per cent of the world's gross tonnage of merchant shipping) is not yet in force, although it has been ratified by 30 States with more than 60 per cent of the world's gross tonnage. Ratification by one major shipping nation would thus have the effect of bringing it into force.

Other matters have proved less complicated. In some parts of the world there is an extensive movement of pilgrims by sea; a Special Trade Passenger Ships Agreement was adopted by IMCO in 1971 to safeguard ships and passengers engaged in this trade which came into force three years later. A Protocol to this agreement, adopted by IMCO in 1974, came into force in 1977.

One of the most common causes of accidents at sea is collisions. Measures to prevent these occurring were included in an Annex to the 1960 Safety of Life at Sea Convention but, in 1972, IMCO adopted a new Convention on this subject which included a number of new features. Among these were regulations concerning traffic separation schemes which had been introduced as a recommendation in several parts of the world where maritime traffic was particularly congested. The adoption of such schemes has considerably reduced the number of collisions in many areas and the coming into force of the Convention in 1977 has led to further improvements.

Another Convention adopted by IMCO in 1972 dealt with the subject of containers. These had by then become an important feature of international maritime trade and the Convention was designed not only to facilitate this trade by providing uniform international regulations, but also to maintain a high level of safety in the carriage of containers by providing generally acceptable test procedures and related strength requirements.

The fact that such a Convention was considered necessary was an indication of the rate of change in shipping: after all, containers had scarcely been invented when IMCO came into existence. Another sign of change was the adoption in 1976 of the International Convention on the International Maritime Satellite Organization. Conventional radio facilities have become increasingly congested in recent years and it is physically impossible to increase the number of wavelengths available.

By using space satellites these difficulties can be overcome. This would be of great benefit in commercial and other aspects of ship operation, but its greatest advantage would be in safety for improved communications would enable distress messages to be transmitted and received much more effectively than they are at present. The Convention came into force on 16 July 1979 and resulted in the establishment of a new international organization which, like IMCO, is based in London.

By contrast to space technology, fishing is one of the world's oldest industries. Yet it was not until 1977 that the first ever International Convention dealing with the safety of fishing vessels was finally adopted. One of the reasons for this is the extremely varied and complex nature of the fishing industry which is so different from other forms of maritime activity that many other conventions adopted by IMCO cannot be made applicable to fishing vessels. For example, in what other maritime activity do ships leave port with their hatches closed and their holds empty, head into the middle of the ocean and then open their hatches and start loading cargo? The 1977 Convention, which will apply to new fishing vessels of 24 metres in length and over, is expected to be of great benefit to the safety of fishing vessels when it comes into force.

Ultimately, safety rests very largely with the crews of ships rather than with the ships themselves. It has long been recognized that an improvement in crew standards would automatically lead to an improvement in maritime safety and, in 1978, IMCO convened a conference which resulted in the adoption of the first ever Convention on Standards of Training, Certification and Watchkeeping for Seafarers.

The aim of the Convention is to establish, for the first time, internationally acceptable minimum standards for crews. It is not designed as a model on which all nations must necessarily base their crew requirements for in many countries the requirements are actually higher than those laid down in the Convention. It is aimed at eliminating inadequate, or supplementing insufficient, requirements wherever necessary while, at the same time, helping the less experienced maritime nations which are in the process of building up their fleets to know what sort of standards are acceptable on a global scale as a minimum.

In April 1979 IMCO adopted the International Convention on Maritime Search and Rescue. As its title implies, this Convention is designed to improve existing arrangements for carrying out search and rescue operations following accidents at sea. Although many countries have their own established plans for such emergencies, this is the first time international procedures have been adopted.

The adoption of Conventions such as those described above is perhaps the most important of IMCO's activities but its work involves many other aspects. In addition to the Conventions, whose requirements are mandatory for nations which ratify them the Organization has also produced numerous Codes, Recommendations and other instruments dealing with safety. These do not have the same legal power as Conventions but can be used by individual governments as a basis for domestic legislation or as guidance. Some of the most important of these deal with bulk cargoes, the safety of fishermen and fishing vessels, the carriage of dangerous goods, the carriage of bulk chemicals, liquified gases and timber deck cargoes.

Prevention of Pollution

The 1954 Oil Pollution Convention (for which IMCO became the depositary in 1959) was the first major attempt by the maritime nations to curb the impact of oil pollution.

But if the problem was bad then it is far more serious today. The amount of oil carried by sea has risen by 700 per cent in 20 years—to around 1700 million tons. The world tanker fleet has increased from 37 million deadweight tons in 1954 to around 340 million deadweight tons today and the size of the tankers themselves has also grown amazingly. Several ships of more than 500 000 deadweight tons are currently in existence while in 1954 the largest ship in the world was little more than 30 000 deadweight tons. It is small wonder, therefore, that since coming into existence IMCO has devoted increasing attention to the problem of marine pollution.

The 1954 Convention was amended in 1962 but it was the wreck of the *Torrey Canyon* in 1967 which fully alerted the world to the great dangers which the transport of oil posed to the marine environment. Following this disaster, IMCO produced a whole series of Conventions and other instruments. The 1954 Convention was again amended in 1969. In 1969 two new Conventions were adopted as part of the result of IMCO's work arising from the *Torrey Canyon* disaster in 1967. One of these gives States the right to intervene in incidents on the high seas which were likely to result in oil pollution. The second Convention dealt with liability of the ship or cargo owner for damage suffered as a result of an oil pollution casualty. The Convention was intended to ensure that adequate compensation is available to victims and places the liability for the damage on the shipowner.

It was felt by some delegates to the Conference that the liability limits established at this Conference were too low and that the compensation made available could in some cases, therefore, prove to be inadequate. As a result another Conference was convened by IMCO in 1971 which resulted in the adoption of a Convention establishing the International Fund for Compensation for Oil Pollution Damage. The Convention came into force in 1978 and the Fund has now been established with its headquarters in London.

Unlike the Civil Liability Convention, which puts the onus on the shipowner, the Fund is made up of contributions from oil importers. The idea is that if an accident at sea results in pollution damage which exceeds the compensation available under the Civil Liability Convention, the Fund will be available to pay an additional amount while the burden of compensation will be spread more evenly between shipowner and importer.

These three Conventions all deal with what one might call the legal aspects of oil pollution. But the continuing boom in the transportation of oil showed that more work was needed to be done on the technical side as well. The scale of oil pollution was so great in some areas that there was a serious concern for the marine environment, not only as a result of accidents but through normal tanker operations notably the cleaning of cargo tanks.

In 1971 the 1954 Oil Pollution Convention was further amended. One amendment will limit the hypothetical outflow of oil resulting from an accident while the other aims at providing special protection for the Great Barrier Reef of Australia.

In 1973 a major Conference was called to discuss the whole problem of marine pollution from ships and resulted in the adoption of the most ambitious anti-pollution Convention ever adopted. The Marine Pollution Convention dealt not only with oil but other forms of pollution including that from garbage, sewage, chemicals and other harmful substances. The Convention greatly reduces the amount of oil which can be discharged into the sea by ships and bans such discharges completely in certain areas (such as the Black Sea, Red Sea and other regions). It gives statutory support for such operational procedures as 'load on top' (which greatly reduces the amount of mixtures which have to be disposed of after the tank cleaning) and segregated ballast tanks.

In practice certain technical problems meant that progress towards ratifying this Convention was very slow and a series of tanker accidents which occurred in the winter of 1976–77 led to demands for further action. The result was the convening of the Conference on Tanker Safety and Pollution Prevention in February 1978. This Conference could well prove to be one of the most important ever held by IMCO. Not only did it complete its work in a remarkably short time (barely ten months after the first call to IMCO to convene the Conference was made) but the measures adopted will have a profound effect on tankers in the future. They include requirements for such operational techniques as crude oil washing (a development of the earlier 'load on top' system) and inert gas systems, but also include constructional requirements such as segregated ballast tanks for much smaller ships than stipulated in the 1973 Convention. The most important of the new measures are incorporated in Protocols to the 1974 Convention on the Safety of Life at Sea and the 1973 Marine Pollution Convention. It is expected that one effect will be to bring the requirements of the 1973 Convention regarding oil pollution into force much more rapidly than would have been possible before.

In addition to these measures IMCO has also been working on various other projects which are designed to reduce the threat of oil pollution. One of these is the Regional Oil-Combating Centre established in Malta in conjunction with the United Nations Environment Programme in December 1976. The Mediterranean is particularly vulnerable to pollution and a massive oil pollution incident could be catastrophic. The purpose of the centre is to co-ordinate anti-pollution activities in the region and to help develop contingency plans which can be put into effect should a disaster occur.

The success of this venture is being closely followed in other parts of the world and IMCO has taken part in projects in areas such as the Caribbean, West Africa and elsewhere.

Other matters

While safety and the prevention of pollution are IMCO's chief concern, the Organization is also involved in many other areas. One of these is the facilitation of maritime traffic. Since the turn of the century, the requirements of statisticians and the ever-increasing sophistication of the shipping industry itself have led to an increase in the number of national authorities taking an interest in the call of ships and personnel at ports. In the last few decades the lack of internationally standardized documentation procedures has imposed a heavy burden upon both shipborne and shore-based personnel and caused considerable delays.

IMCO started working on these problems soon after coming into existence and in 1965 adopted the Convention on Facilitation of Maritime Traffic. Its primary objectives are to prevent unnecessary delays in maritime traffic, to aid co-operation between Governments and to secure the highest practicable degree of uniformity in formalities and procedures. The Convention came into force in 1967 and was amended in 1973.

IMCO's work on establishing régimes of liability for pollution has already been referred to but the Organization has also adopted various Conventions dealing with aspects of liability.

In 1971, IMCO, in association with the International Atomic Energy Agency and the European Nuclear Energy Agency of the Organization for Economic Co-operation and Development, convened a Conference which adopted a Convention to regulate liability in respect of damage arising from the maritime carriage of nuclear substances.

In 1974 IMCO turned its attention to the question of passengers and their luggage and adopted a Convention which establishes a régime of liability for damage suffered by passengers carried on sea-going vessels. It declares the carrier liable for damage or loss suffered by passengers if the incident is due to the fault or the neglect of the carrier. The limit of liablity is set at $55 000 per carriage.

The general question of liability was dealt with in a Convention adopted in 1957. As time went by, however, it became clear that the limits of liability established were too low and in 1976 IMCO adopted a new Convention which raised the limits, in some cases, by 300 per cent. Limits are specified for two types of claim—those for loss of life or personal injury and property claims such as damage to ships, property or harbour works.

Technical Assistance

While the adoption of Conventions, Codes and Recommendations has in the past been IMCO's most important function, in recent years the Organization has been devoting increasing attention to securing the effective implementation of these measures on an international scale. As a result the Organizations' technical assistance activities have become more and more important and in 1975 IMCO took steps to institutionalize the Committee on Technical Co-operation—the first United Nations body to do so.

The purpose of the technical assistance programme is to help States, many of them developing nations, to reach the high standards laid down in IMCO Conventions and other instruments.

The specialities of the advisers and consultants now employed by IMCO—many of them permanently in the field as well as at headquarters—gives an indication of the scope of the technical assistance programme. They deal with such matters as maritime safety administration, maritime legislation, marine pollution, training for deck and engineering personnel, technical aspects of ports and the carriage of dangerous goods.

Through the technical assistance programme IMCO is able to offer advice on these and other areas to assist in the acquisition of equipment and the provision of Fellowships by which students can obtain abroad advanced training which is not available in their own countries. In some cases financial aid can be provided through agencies such as the United Nations Development Programme, the United Nations Environment Programme and many donor countries.

Conclusion

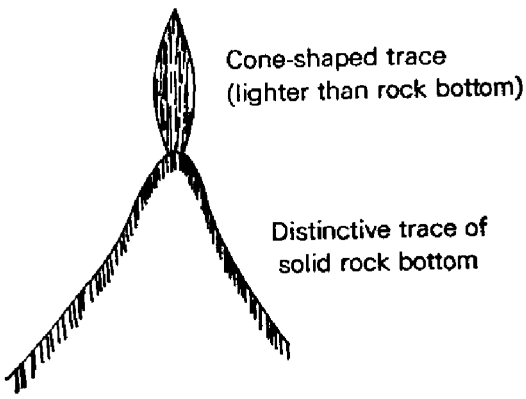
It is impossible to assess very precisely the effectiveness of the numerous safety and anti-pollution measures which have been adopted by IMCO during the last 21 years. The shipping industry has altered so much that no valid comparison can be made. But there is no question that there is still an enormous amount of work to be done and the role of IMCO as the forum for the international shipping community is now fully and universally recognized and this places great responsibility on the Organization and its Member Governments.

The success achieved to date through the goodwill and determined efforts of the international community, using IMCO as a forum and a platform, merely demonstrates that the past 21 years in the struggle for safer shipping and cleaner oceans are indeed only the first stage in a continuing endeavour.

SOUNDINGS IN A VOLCANIC AREA

On page 20 of the January 1978 edition of *The Marine Observer* we published an observation made by the Master and officers of the watch of s.s. *Remuera* whilst in the Pacific Ocean. The following is a précis:

'11 February 1977. Whilst passing to the south of Espanola Island in the Galapagos Group the echo-sounder showed a distinct trace of the sea bed to a depth of 600 fathoms. Between 1130 and 1430 GMT we were receiving a very detailed trace of the sea bed which was extremely undulating, rising in sharp peaks and falling again. This left no doubt that it was volcanic in origin. Occasionally where the trace reached a peak in the region where the crater would be expected, there rose a faint but distinctly elongated cone-shaped trace on the echo-sounder paper, this was not thought to be solid bottom as the trace of rock could be clearly seen; 5 such traces were seen.



'The phenomenon was considered to be either volcanic action or thermal activity due to the volcanic nature of the bottom. Any thermal activity would change the density of the water, thus being received as an echo and traced on the paper.

'Throughout the period the sea temperature remained steady at 26·4°C. The sea surface was rippled by a SE'ly, force 1–2 wind and there was a low SW'ly swell; no disturbance was noticed whilst passing over the phenomenon. A fall of 2 degrees in the sea temperature was observed when the area had been cleared at 1730.'

We have now received the following comments on the observation from Mr Alan Ruffman, President/Geophysicist of Geomarine Associates Ltd, Halifax, Nova Scotia, Canada:

'I have just read the item which deserves comment which may be of interest to readers of *The Marine Observer*. Whilst the evidence presented is sketchy and the echo-gram is not available, nor is the actual depth presented, it is reasonable to suggest another explanation for the phenomenon observed.

'The writer is quite correct in assessing the bottom topography in the area as volcanic. Indeed the Galapagos Islands are a non-marine outcropping of a marine ridge or mountain chain that appears to represent an active spreading centre for an oceanic plate. The area is further complicated by the confluence of several plate boundaries in the vicinity and is subject to considerable study by geophysicists and geologists.

'Had the *Remuera's* echo-sounder observed just a density change, it would not have observed it unless the density change was sufficient to give a reflection and this would only have shown the boundary of the plume, instead the sketch shows the whole plume returning energy to some degree.

'I suspect what was observed was a part of a plume, quite possibly of hotter water, but also containing small bubbles of gas, thus each bubble became a reflection and the whole plume appeared grey on the echo-gram. Were the bubbles larger or too numerous, the bottom would have been obliterated, or rather "clouded", from view. Currents probably were moving the plume to one side thus the cone of the echo-sounder transmission only caught the emanation of the plume. Had the vessel passed 2–3 cables to either side, possibly only the upper expanded part of the plume would have shown nearer the surface.

'Super heavy hot brines, as hot as 28°c or more and loaded with abnormal concentrations of heavy metals, like mercury, are known to site in certain pools along the spreading centre of the rift of the Red Sea. Lately, scientific investigation has shown that hot brines exist around the Galapagos Islands and they are now subject to further detailed investigation. The emanations seen by the *Remuera* may well be further fine evidence of the active nature of the area and may point to one more source of heavy brines. I compliment the ship on its astute use of the sounder and enclose a low-frequency example of another observation.'

Note. The sketch accompanying the original observation is reproduced here and a photograph accompanying Mr Ruffman's comments appears opposite page 84.

SWELL WAVE OBSERVATIONS BY RADAR

The following comments have been received from Captain Somesh Chandhuri of the *India Glory:*

'Over the years, watching sea clutter on the radar screen, I find 2 distinct patterns of clutter exist:

1. The ordinary sea clutter, ever present on the radar screen when the wind exceeds force 2.
2. The striated pattern of clutter, observed when swell is present. The distinct striations loose their identity and merge into sea clutter as the swell becomes less pronounced.

Whilst on passage from Los Angeles across the Pacific to Surigao (Mindanao Island) during June 1979 actual movement of swell approaching the vessel and receding could be discerned when a particular striation was observed on the radar screen on the 1·5 miles range. By using the range marker and the range rings simultaneously, wave-length and swell speed could be measured fairly accurately. By placing the electronic bearing marker at right-angles to the incoming striations, the bearing of the swell source could be determined. This opens up one more possibility of advanced determination of the centre of a tropical revolving storm. Often, what would appear as confused sea-swell conditions to the eye would emerge as a distinct striated pattern when observed on the radar screen. The electronic bearing marker indicator used as described above could easily confirm the direction of the storm centre.

'A true motion radar will project absolute values for bearing and speed. Ships with ordinary radars could arrive at the same values by combining the vectors ship's course/speed and striation's apparent course/speed as done in radar plotting.'

Note. From the speed thus ascertained, the period of the swell may be deduced from the relationship:

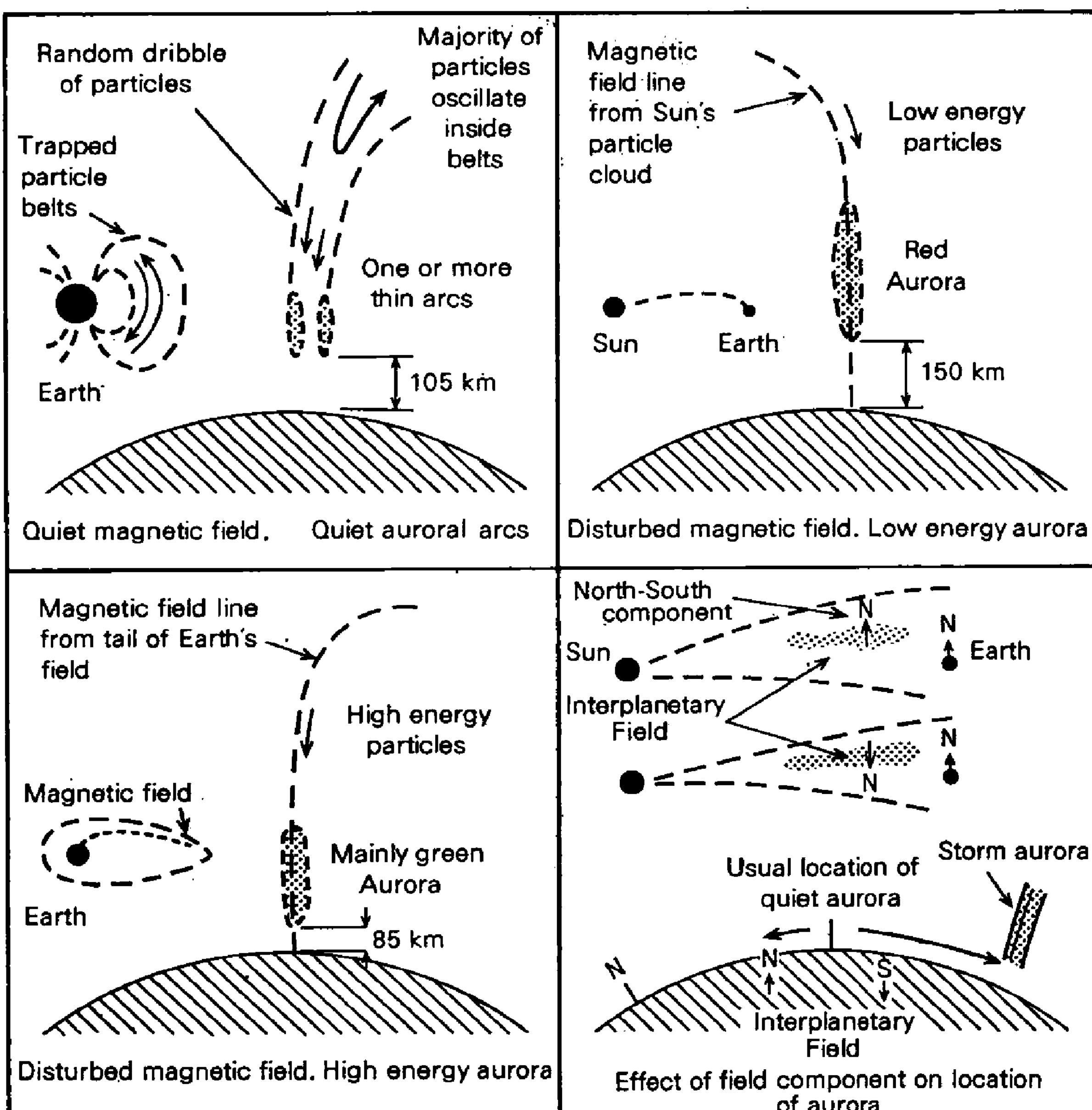
Speed = 3·1 x period

AURORA NOTES APRIL TO JUNE 1979

By R. J. Livesey

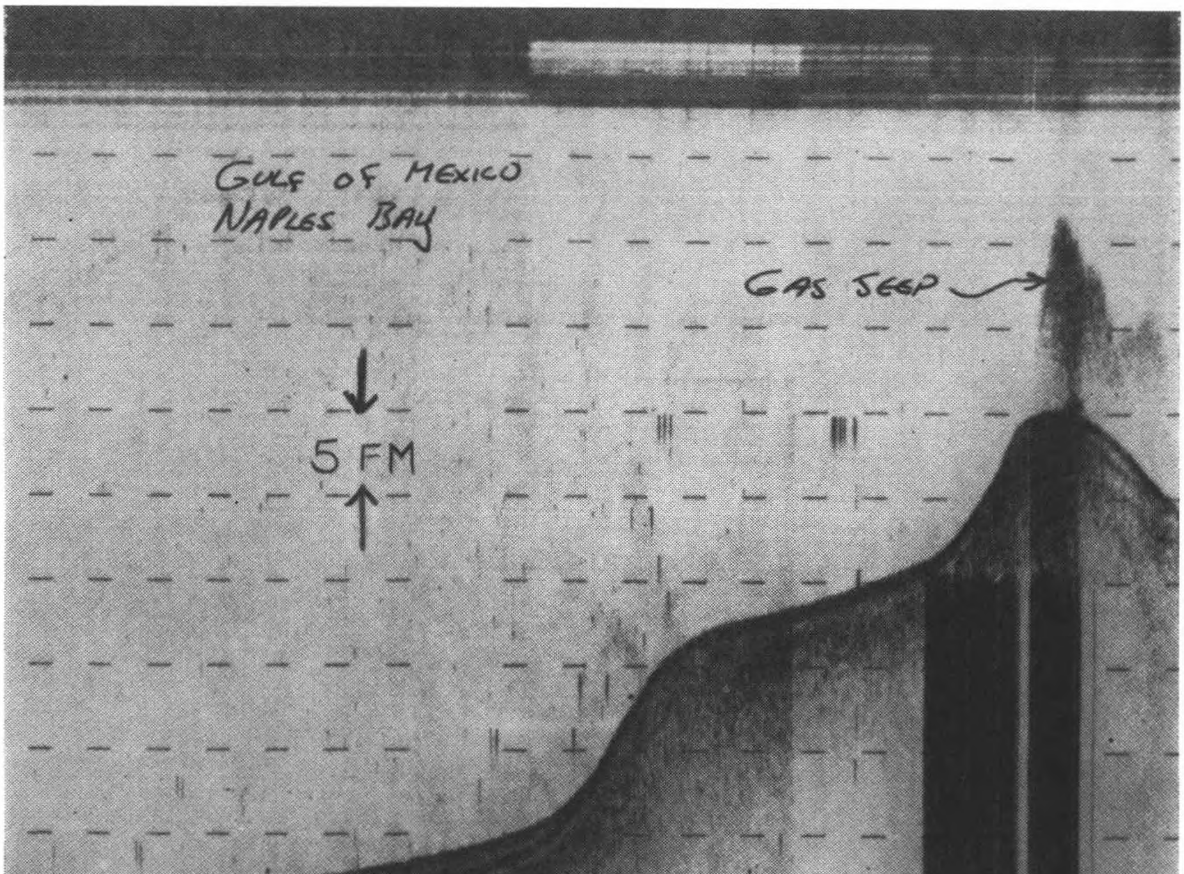
(Co-ordinator of Auroral Observing, the Solar Section of the British Astronomical Association)

Details of the marine aurorae observed during the period are shown at the end of these notes. The writer gratefully acknowledges the effort made by the masters and officers of the ships concerned in observing and recording auroral activity in addition to normal shipboard routines.

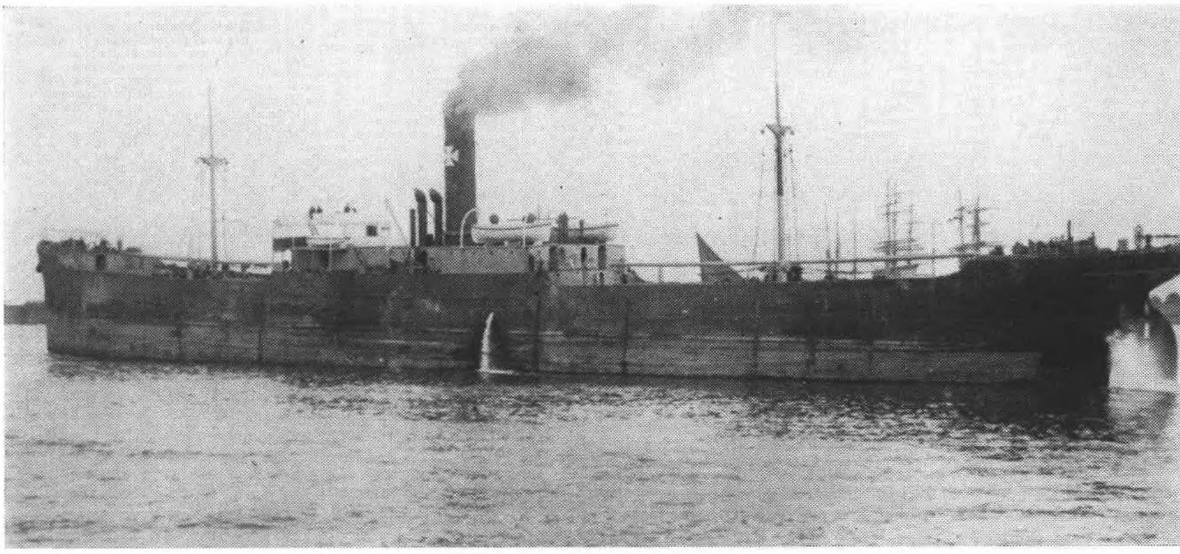


Probable connection between magnetic fields and aurorae

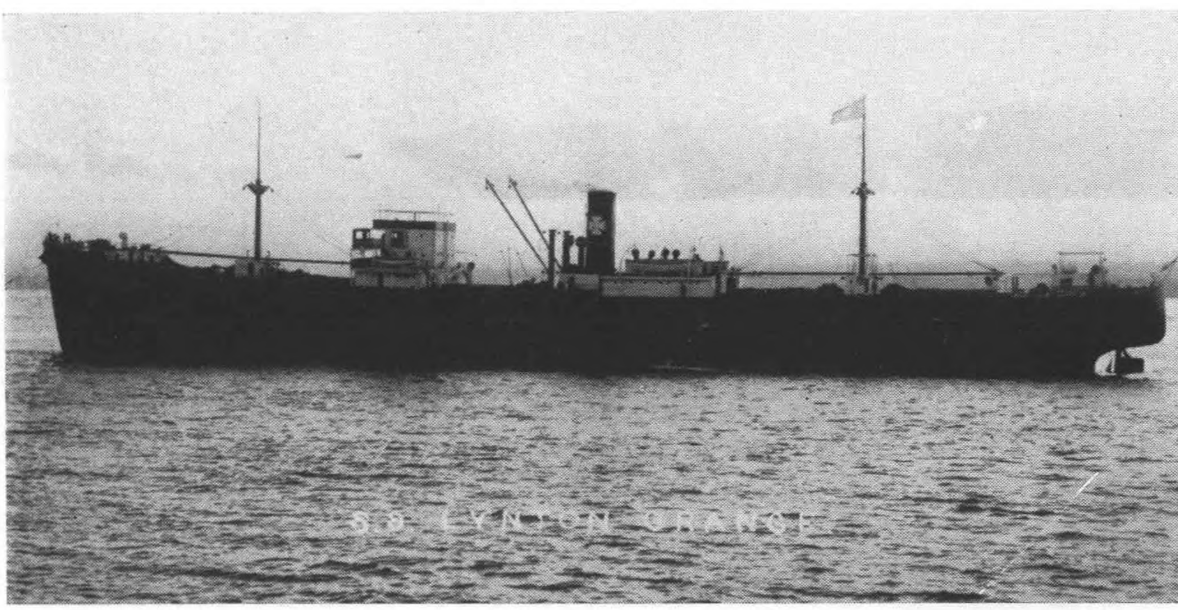
Black-footed Albatross (*see* page 68)



Low frequency echo-gram showing sub-bottom penetration and reflections from a rising gas plume (*see* page 82)



Lynton Grange (1912)



Lynton Grange (1937) *Copyright B. & A. Feilden*

Lynton Grange (1976)

VESSELS OF HOULDER BROTHERS & COMPANY LIMITED

(*see* page 86)

The period concerned provided a good illustration of recurrent aurorae triggered off by an active region on the sun as it rotated. Each time the sun's surface and the earth were in the same relative position, the earth came into contact with the streams of electrified particles and associated magnetic fields coming from the solar activity, leading to disturbances of the earth's magnetic field, visual and radio auroral phenomena.

From 26 March to 5 April, 21 April to 1 May and 18 to 27 May, there were periods of considerable activity. Widely reported activity was noted on 1, 3, 21, 24 and 29 April. By May the number of observers active was becoming reduced to the onset of summer conditions in the northern hemisphere, but the period 18 to 22 May was active. Only isolated reports were received for June, but the pattern of distribution is consistent with return time for the active area.

A significant feature of interest was that immediately preceding each active auroral period, the earth's magnetic field had become steadily quiet over a period of days, then was literally galvanised into action by a solar disturbance which brought on associated aurorae. At magnetic observatories the horizontal and vertical components of the magnetic field strength were measured and recorded. The pattern of the disturbance was frequently related to the type of visible aurora observed.

In very elementary terms the earth is bombarded by a solar outburst with electrified particles which carry with them their own magnetic field. If the component of that field parallel with the earth's axis points northwards then auroral activity due to the particles, in the northern hemisphere, will tend to be seen at the observer's magnetic midnight in the region of the auroral zone at 67 degrees geomagnetic latitude or thereby. If the north field component is strong the location of the aurora will shrink polewards. On the other hand if the north-south magnetic field component of the particle stream points south, then complicated processes take place in the earth's magnetic field in space such that disturbances are set up to inject electrified particles at more southerly latitudes. Thus the aurora is seen to creep to lower latitudes, both in the northern and southern hemispheres. Magnetic and auroral storm physics are still a matter for considerable research and the whole story is by no means yet told.

Three variations of the aurora are currently thought to exist. The first consists of quiet forms and thin arcs caused by particles entering the atmosphere from the radiation belts enveloping the planet. The second variation occurs when a magnetic storm develops and consists of low energy particles sliding down the lines of force directly connected between the interplanetary and earth magnetic fields to produce red aurorae at heights of between 150 and 400 kilometres above the earth's surface. The third variation, which may occur at the same time, is when high-energy particles are formed by acceleration along magnetic field lines leading from the tail of the earth's enveloping magnetic field where the particles enter the field from interplanetary space and the sun to the point of injection into the atmosphere to form the storm aurora which may be seen anywhere from about 85 kilometres in altitude. It is thought that discrete auroral forms may well indicate the point where the magnetic fields of the second and third auroral types meet. Diffuse aurora, which may be of the first type, or seen as a residual activity after a major storm has retreated polewards, is thought to be due to the release of particles trapped by the magnetic fields.

The variations in the earth's magnetic field associated with aurorae may cause a compass card to deviate by a degree or so and to oscillate according to the changes in the field. Mariners, nowadays, no longer rely solely on the standard compass for accurate navigation, although if modern technology fails it is there as the fundamental system of direction finding. It is of interest to remember, therefore, that if strong auroral activity is close at hand, the earth's magnetic field is being affected at the same time. Such magnetic activity has been known to generate electrical currents in long telephone cables to cause damage and fatal accidents. L. Harang, the great Norwegian investigator of the aurora, reported having measured generated voltages of up to 60 volts per kilometre on 24 March 1940 on cables near Tromso. It may be seen, therefore, that there are also practical matters of interest related to the aurora which we observe for scientific purposes or aesthetic pleasure.

DATE 1979	SHIP	GEOGRAPHIC POSITION	TIME (GMT)	FORMS
1 April	*St Jaspar*	71° 02′N 29° 46′E	2045	qhA
2 April	*Admiral Beaufort*	57° 06′N 20° 36′W	0230–0450	qRdB, pRdB, qRdB

KEY: A = arc, h = homogeneous, p = pulsating, q = quiet, Rd = rayed, B = band.

Marine Aurora Observations April–June 1979

LONG ASSOCIATION WITH SHIPOWNERS—HOULDER BROTHERS & COMPANY LIMITED

Our annual article in this series of 'Long-Service' articles continues this year with a short history of Houlder Brothers & Co. Ltd, now an integral part of the Furness Withy Group.

The founder of the firm, Edwin Savory Houlder a young man of 21 years, received the blessing and financial aid of his employers in 1849 when he set up business on his own account from the office of his employers, Ionides Sgouta & Co., in Gracechurch Street, London.

By 1853 he was established in his own office at 6 Benet's Place, Gracechurch Street and trading as E. S. Houlder & Co., Ship and Insurance Brokers. The firm also acted as merchants, shipping and forwarding agents; these activities provided much of the earliest business. Mr Houlder directed his energies to the increase of the shipping transactions and secured contracts as loading and passenger broker for some of the clipper ships engaged on the Australian service. Being fully aware of the great trading possibilities that the development of Australia and the outward movement of emigrants presented, Mr Houlder concentrated his efforts on the expansion of the Australian trade.

The firm steadily expanded from these activities and consequently, being unable to give his personal attention to all matters, Mr Houlder decided to take his brother Alfred into partnership, the title of the firm being changed to Houlder Brothers & Co. This occurred about 1856 and shortly afterwards, larger premises being required, the firm moved its headquarters to 146 Leadenhall Street where it remained for many years.

The year 1861 was an eventful one in the Company's history marking the beginning of its ship-owning era. Some doubt exists concerning the first ship acquired. It has been claimed that she was the *Alarm*, of Boston, but apart from the fact that a model of this vessel is still in the Company's possession no other information has been traced to establish this claim. There is, however, no doubt about the acquisition of the *Golden Horn* in that year, a full rigged ship of 1193 tons built in 1854 by Clark & Wood of Wiscasset, Maine. The 'Golden' ships were speedy American built clippers which were chartered out to foreign owners for safety reasons during the American Civil War. Houlders handled the *Golden Sunset*, *Golden Cloud* and *Golden Fleece* on behalf of American owners. In 1862 the Company was advertising a 'semi-monthly line of clipper ships from London to Port Phillip'; the introduction of steam vessels also occurred in 1862 when it advertised the *Alhambra*, of 500 hp, to carry special mails and passengers to Adelaide in under 60 days. By 1863 the outward sailings had developed into a regular service to New Zealand as well as Australia. Although the Company was acquiring tonnage rapidly it continued to charter additional vessels of the fast clipper type.

By the early 1870s the Company's ships were calling at South African ports as part of their established programme and in 1879 their purchase of *Queen of the North* marked the beginning of the Company's changeover from wooden to iron vessels.

In 1881 the firm turned its attention to the South American trade, its particular interest being the River Plate, and one of the first contracts—the forerunner of a long series of meat-carrying agreements—was with the River Plate Fresh Meat Company for the conveyance of frozen meat from the Argentine to the United Kingdom. The first shipment was ready for despatch from the Campana Works in 1883 and, with the sailing of the *Meath*, an iron steamer of 2403 tons chartered by Houlders, the firm has the distinction of inaugurating this important trade.

In 1890 the Company acquired its first steamer and with the delivery of the *Hornby Grange* the Houlder Line came into being. Commencing with this ship the nomenclature of the fleet is of interest. It can be noted that the initial letters of the vessels spelt the firm's name. By 1899 the fleet comprised *Hornby Grange*, *Ovingdean Grange*, *Urmston Grange*, *Langton Grange*, *Denton Grange*, *Elstree Grange*, *Royston Grange*, *Beacon Grange*, *Rippingham Grange* and *Southern Cross*. The suffic 'Grange' used for all Houlder liners was adopted because, at the time, Mr E. S. Houlder's home was 'The Grange', Sutton, Surrey. It was the custom to have a photograph of a country house or grange, after which the ship had been named, displayed on the stairway leading to the passenger saloon in all the Grange ships.

The first direct association between Houlders and the Meteorological Office, apart from chartered ships, were the *Elstree Grange* and *Urmston Grange* which both first appear in our records in November 1903. The first meteorological logbook of the former ship is unfortunately missing but we do have the first records from s.s. *Urmston Grange* of London, 2213 grt, commanded by Captain W. Keslake. These records cover the period 5 February 1904 to 12 February 1905. Commencing at Liverpool the voyage included calls at Cape Town, Australian ports, South African ports, return to Australian ports and thence Dunkirk via the Suez Canal.

Captain Keslake's meteorological observations were diligently made at the end of each watch in a neat and elegant handwriting. No additional pages were included in the logbooks of those days for ocean currents or additional remarks, but the noon to noon set and drift was entered each day and the remarks columns on the daily pages abounded with observations of locusts, dolphins, luminescent water, meteors, etc. as well as the usual meteorological remarks giving times of wind shifts and precipitation. The voyage appears to have been largely uneventful, at least as far as weather experienced.

The recruitment of *Urmston Grange* and *Elstree Grange* was followed by *Lynton Grange*, *Thorpe Grange* and others.

An agreement was reached in 1902 to despatch 12 steamers from New Zealand to South Africa, each ship to carry up to 1000 head of cattle or horses in addition to 100 000 carcases of mutton and other general cargo. A further contract enabled the Company to act as buying agents for the Imperial Military Authorities to ship frozen meat to South Africa. It was during that year that Houlders, in conjunction with the Federal Steam Navigation Co., commenced a service between New Zealand, Australia and South Africa and, under the title of the New Zealand and South African Line, maintained regular sailings for the carriage of refrigerated and general cargo and also a limited number of passengers. Federal Steam later joined Houlders in a service operating between the River Plate and South Africa.

A major re-organisation of the boards of the Company and its subsidiaries was effected in 1911 when Furness Withy acquired a large interest in the Company by purchasing director's shares.

At the outbreak of World War I on 4 August 1914, the ships of the Houlder Line and associated companies were ready to meet any demands made upon them and many and varied were the duties they were called upon to perform. The ships were used as transports, food supply vessels, army supply vessels and later as colliers. The

Urmston Grange was purchased by the Admiralty, filled with cement and sunk in Scapa Flow as part of the defences of this important naval base.

By 1916 all the refrigerated ships of the Company and its associated companies had been requisitioned and most of the general cargo ships were sailing under Admiralty orders. At the end of June 1917 only one of their 43 vessels was available to the Company for free service. Heavy losses due to enemy action were sustained throughout the war, 1917 being a particularly bad year when no fewer than 8 ships were sunk by German U-Boats.

After the war many older ships were disposed of and some new-buildings acquired, but it was a lean time for shipowners and after 1929 the serious world-wide slump in trade was responsible for the disposal of many of the Company's steamers.

At the commencement of hostilities of World War II another chapter in the Company's history of service and sacrifice again characterised its contribution to the Allied war effort. No less than 15 ships totalling 120 028 tons were lost by the Houlder Line during the war years and over 100 sea-going personnel lost their lives. During and after the war a number of Liberty ships were allocated by the Government and after 1945 some Liberty and Empire-type vessels were purchased whilst orders for new tonnage were placed where possible. By 1950 Houlders and their associated companies had embarked on an extensive building programme including refrigerated vessels for the River Plate trade and ore carriers and tankers. In recent years changes in trading patterns have resulted in the demise of the large refrigerated vessels and for several years there were no tankers in the fleet.

Quite recently the Company has taken delivery of two 60 000-ton product tankers from Harland and Wolff, Belfast and both have been given traditional Houlder names-*Hornby Grange* and *Elstree Grange*.

There are also several bulk carriers in the fleet and an important aspect of current activities is the operation of a group of 6 LPG vessels which are jointly owned with Gazocean Paris.

The photographs opposite page 85 show 3 ships which have borne the name *Lynton Grange:*

1. s.s. *Lynton Grange*, built 1912 by Northumberland Shipbuilding Co., of 4252 grt, speed 10·5 knots. She was broken up in 1933 in Italy.
2. The second s.s. *Lynton Grange*, built in 1937 by Blythswood Shipbuilding Co., Scotstoun, of 5029 grt. She was torpedoed in December 1942.
3. The third *Lynton Grange*, a motor vessel built in 1976 by Austin & Pickersgill of Sunderland, 15 903 grt, speed 15 knots. She is a bulk carrier at present operating in the grain trade.

During the 77 years of association between Houlder Brothers & Co. Ltd and the Meteorological Office, the years are exceptional when our Voluntary Observing Fleet did not include the Grange name.

It gives us a great deal of pleasure to express our gratitude to the Company and to all masters and officers, both now and in the past, who have rendered such a sterling contribution to the Meteorological Office.

We wish the Company every success in all their future operations.

J.D.B.

ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM OCTOBER TO DECEMBER 1979

The charts on pages 90 to 92 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 icebergs 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: 1966–75 (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 cold weather of previous months in the Canadian Arctic persisted with more rapid freezing than usual. In particular there were excesses of ice at the end of the month in Baffin Bay and around Southampton Island. East of Greenland, with some anomaly for south-easterly winds and above-average temperatures, the ice extended less than is normal during October so that by the end of the month there were substantial deficits. In the Barents Sea the widespread deficits with which the month started were reduced. The freezing of the Kara Sea was completed, ahead of normal, by the end of October with lower-than-average temperatures.

November

Over north-east Canada, where temperatures were close to the average for the month after the previous cold weather, the ice coverage reverted to nearer normal; excesses persisted in some areas but were largely offset by deficits in others. With an anomaly for low pressure near Iceland winds became more easterly than usual off south-east Greenland where the ice edge remained well west of its usual position. Despite the lack of marked anomalies over the Greenland and Barents Seas the extensive deficits of ice from previous months largely persisted.

December

There were no strong anomalies of temperature or wind. In Baffin Bay and off Labrador ice developed to give an edge close to the normal position by the end of December. This was also the case in the Barents Sea where extensive formation of new and young ice eliminated the deficits of the previous month. In the Greenland Sea, however, deficits persisted with some anomaly for south-easterly winds maintaining the ice edge well north-west of the normal position.

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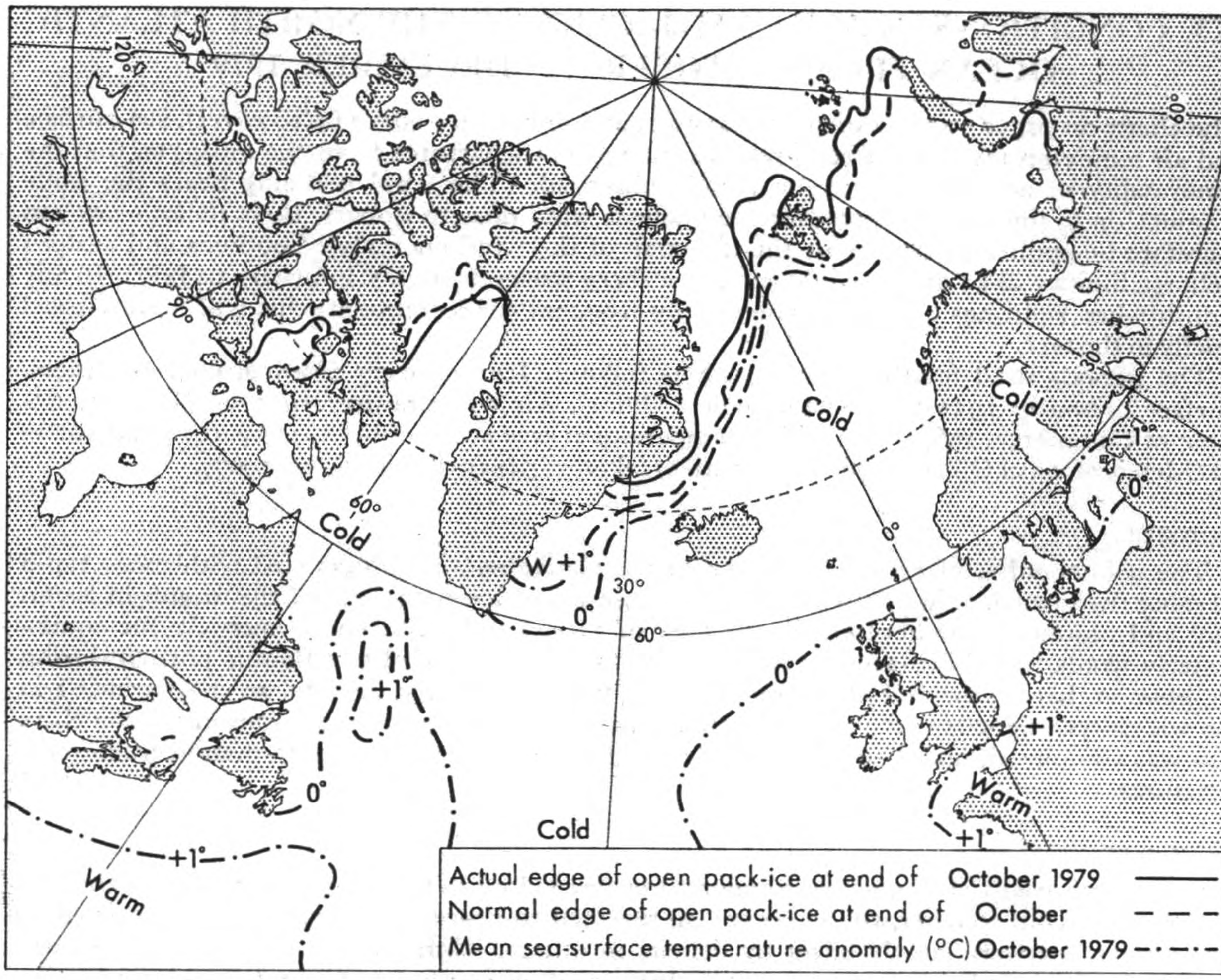
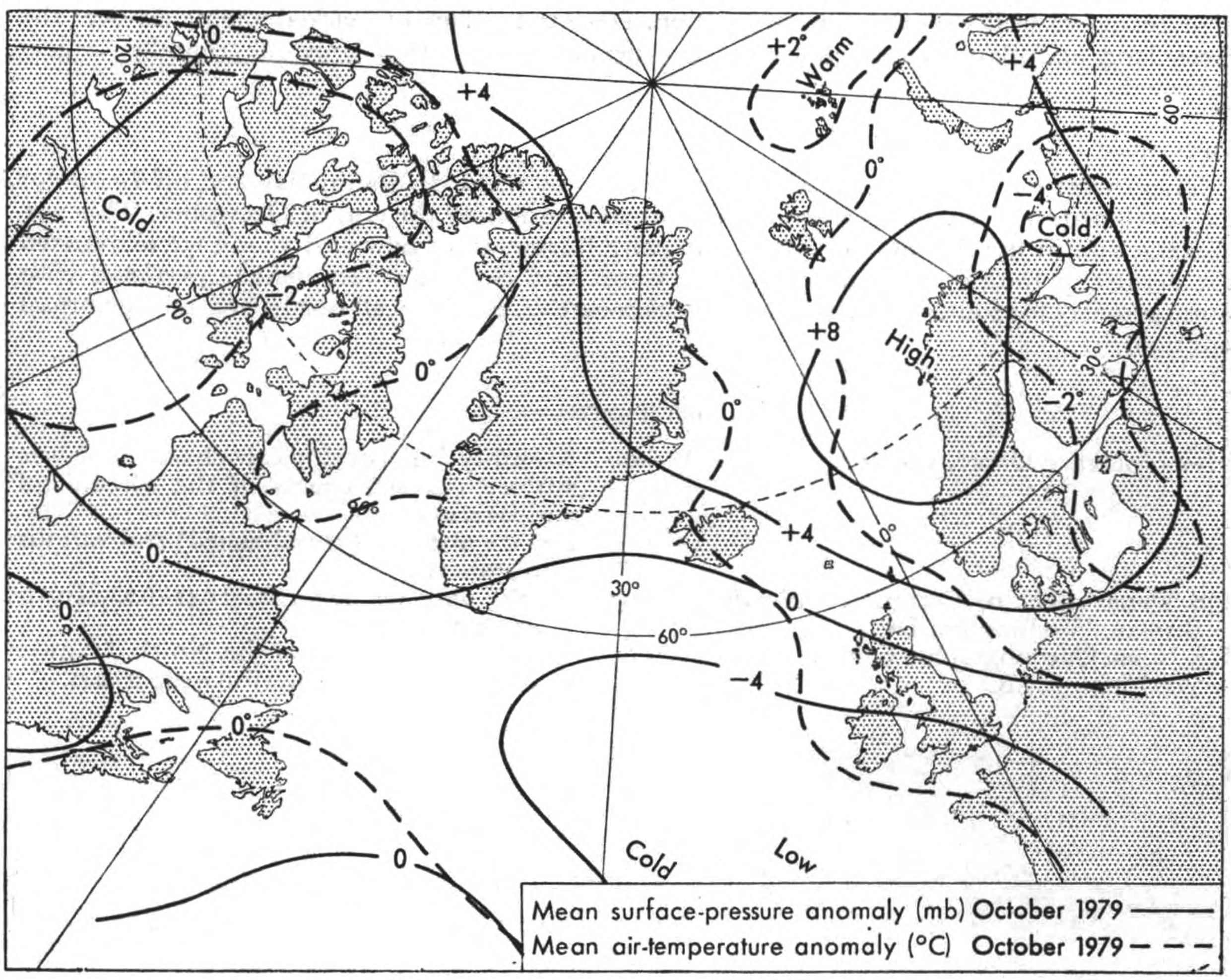
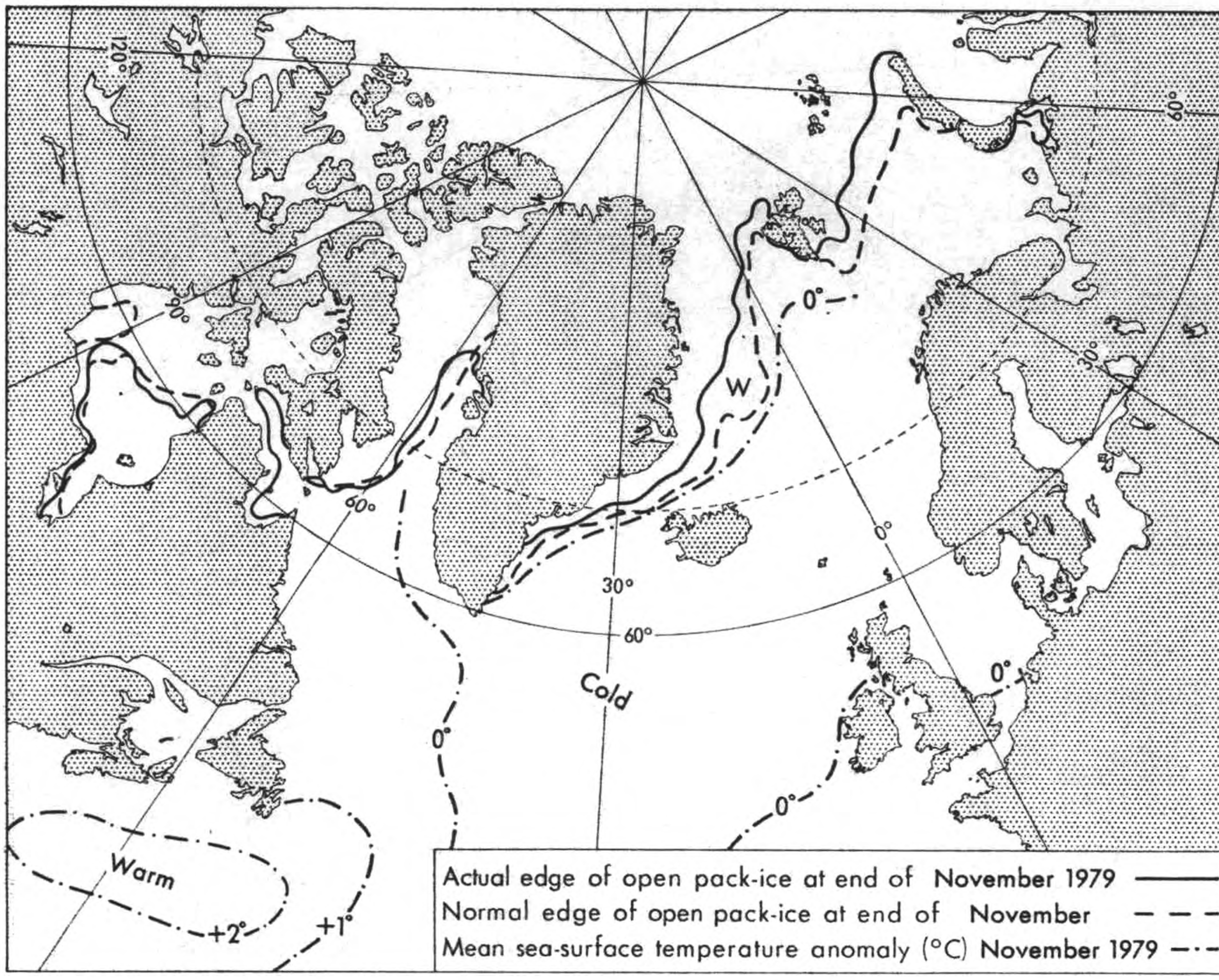
— — Sea ice normals (unpublished) and various publications.

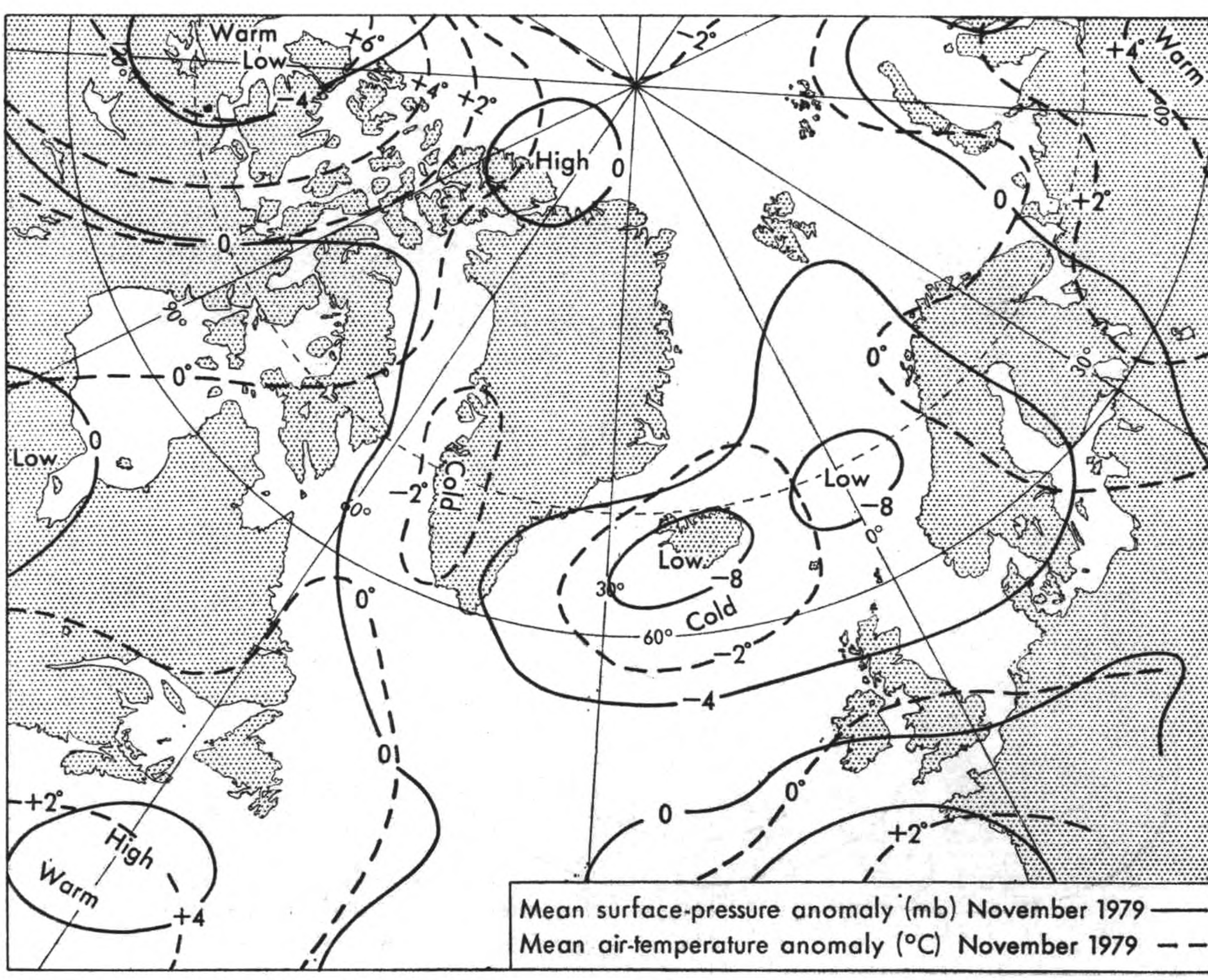
US Department of Commerce Weather Bureau, Washington, DC — 1965 — World weather records, 1951–60. North America

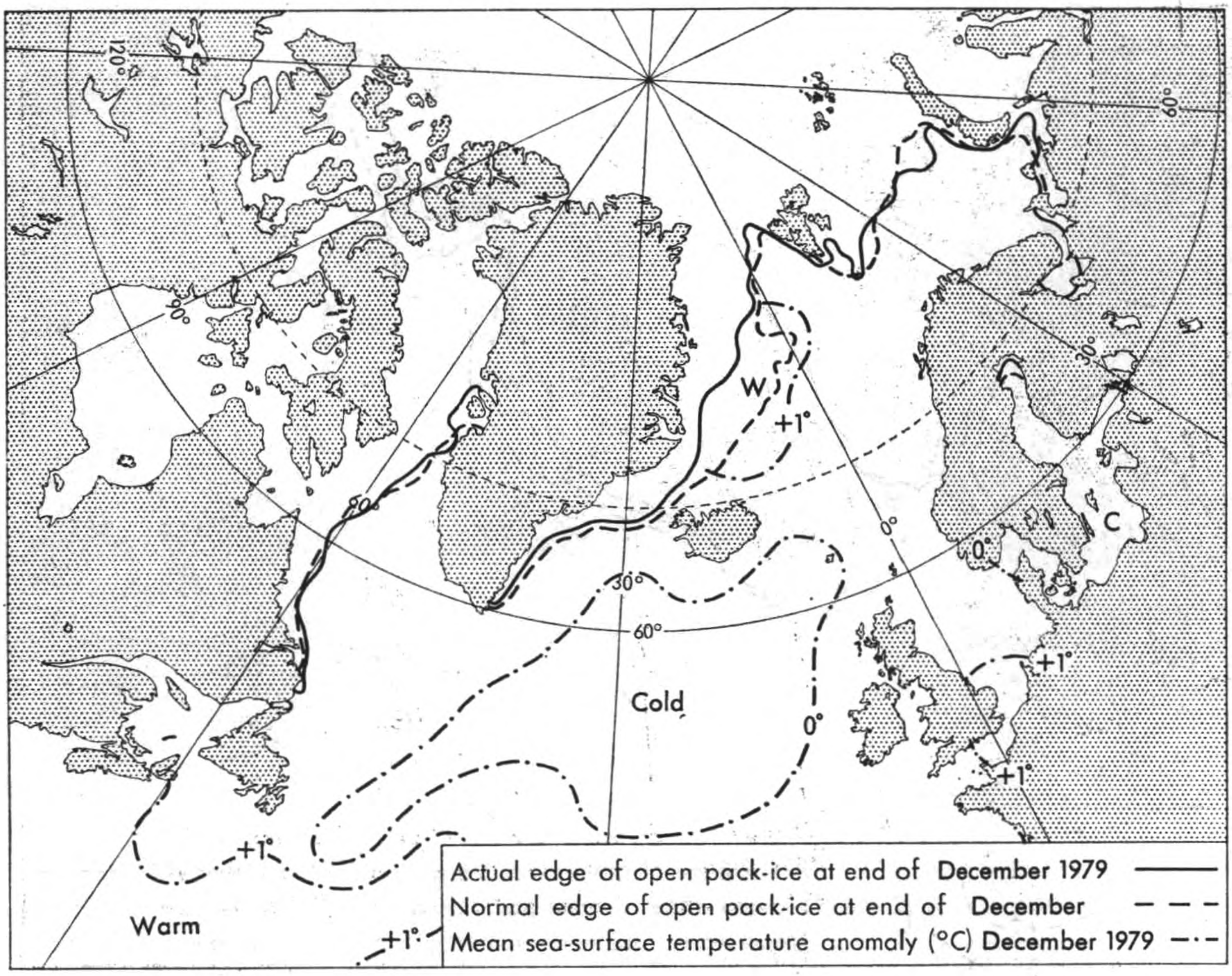
US Naval Oceanographic Office, Washington, DC — 1967 — Oceanographic atlas of the North Atlantic Ocean, Section II: Physical properties.

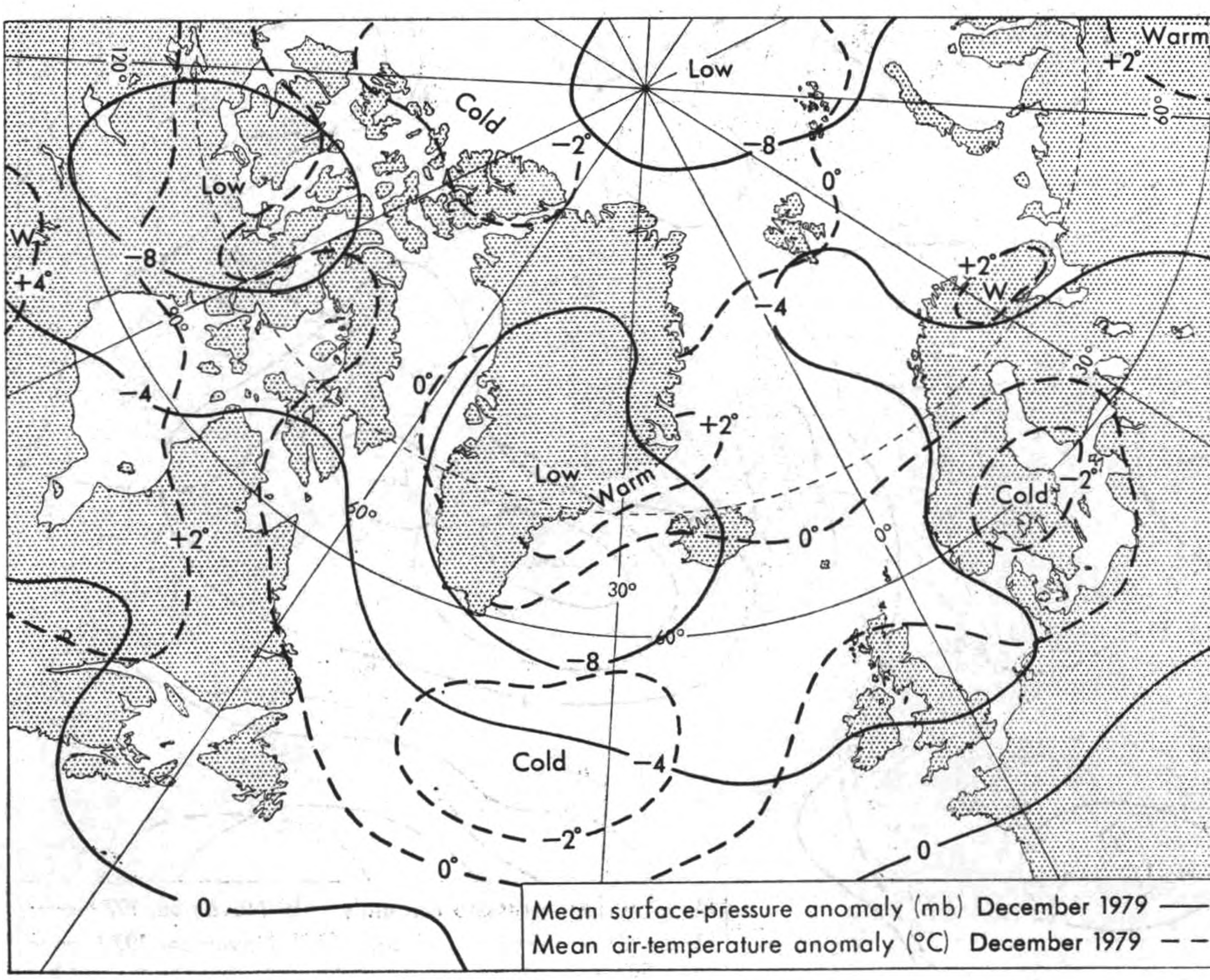

120°
90°
60°
Cold
W +1°
30°
0°
60°
Cold
Cold
−1°
0°
+1°
0°
Warm
+1°
0°
Cold
+1°
Warm
Actual edge of open pack-ice at end of October 1979
Normal edge of open pack-ice at end of October
Mean sea-surface temperature anomaly (°C) October 1979


120°
0
+4
+2°
Warm
+4
60°
Cold
0°
−4°
Cold
90°
−2°
0°
+8
High
30°
0°
−2°
60°
0
+4
0°
0
30°
0
60°
−4
0°
0
Cold
Low
Mean surface-pressure anomaly (mb) October 1979
Mean air-temperature anomaly (°C) October 1979


Actual edge of open pack-ice at end of November 1979
Normal edge of open pack-ice at end of November
Mean sea-surface temperature anomaly (°C) November 1979
Cold
Warm
W
0°
+2°
+1°
30°
60°
120°
90°


Mean surface-pressure anomaly (mb) November 1979
Mean air-temperature anomaly (°C) November 1979
Warm
Low
High
Cold
+6°
+4°
+2°
−2°
−4
−8
+4
0
0°


120°
90°
60°
30°
0°
W
+1°
C
Cold
+1°
Warm
Actual edge of open pack-ice at end of December 1979
Normal edge of open pack-ice at end of December
Mean sea-surface temperature anomaly (°C) December 1979


Warm
+2°
Low
Cold
−2°
−8
0°
W
+4°
Low
−8
+2°
W
−4
0°
+2°
Low
Warm
Cold
−2°
30°
60°
−8
Cold
−4
−2°
0°
0
Mean surface-pressure anomaly (mb) December 1979
Mean air-temperature anomaly (°C) December 1979

Baltic Ice Summary: October–December 1979

No ice was reported at the following stations during the period: Oxelsud, Visby, Kalmar, Göteburg, Mariehamn, Mantylouto, Norskar, Tallin, Emden, Bremerhaven, Hamburg, Flensburg, Kiel, Lübeck, Stettin, Gdansk, Rostock, Stralsund, Copenhagen, Aarhus, Oslo, Kristiansandfjord

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
Lulea ..	0	0	0	0	0	0	0	0	70	10	31	22	22	0	13	9	0	284
Skelleftea ..	0	0	0	0	0	0	0	0	—	12	31	20	0	0	4	16	0	—
Bredskar ..	0	0	0	0	0	0	0	0	—	21	21	1	0	0	1	0	0	—
Sundsvall ..	0	0	0	0	0	0	0	0	—	13	31	19	15	0	19	0	0	—
Sandarne ..	0	0	0	0	0	0	0	0	—	16	31	16	13	0	16	0	0	—
Stockholm	0	0	0	0	0	0	0	0	0	14	31	18	11	0	18	0	0	88
Helsinki ..	0	0	0	0	0	0	0	0	0	14	27	14	0	0	1	0	0	126
Turku ..	0	0	0	0	0	0	0	0	0	13	25	13	1	0	1	0	0	141
Vaassa ..	0	0	0	0	0	0	0	0	9	12	31	19	18	0	17	2	0	143
Oulu ..	0	0	0	0	0	0	0	0	—	12	31	20	20	0	4	16	0	—
Royttaa ..	0	0	0	0	0	0	0	0	—	12	25	14	2	6	6	8	0	—
Leningrad	0	0	0	0	0	0	0	0	9	8	31	24	0	20	22	0	0	137
Viborg ..	0	0	0	0	0	0	0	0	—	4	31	23	20	0	5	17	0	—
Riga ..	0	0	0	0	0	0	0	0	0	14	30	3	0	0	2	0	0	71
Pyarnu ..	0	0	0	0	0	0	0	0	0	10	31	19	9	5	3	0	14	73
Ventspils ..	0	0	0	0	0	0	0	0	—	14	30	3	0	0	0	0	0	—
Klaipeda ..	0	0	0	0	0	0	0	0	—	13	30	7	0	3	5	0	0	—

CODE:

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

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

Book Reviews

ROFAC Route Facility Charts published by Stummel Towning and Company, Victory House, 99–101 Regent Street, London W1R 7HB. 1010 mm × 435 mm.

During the past few years the radio information and navigational services available to mariners in the waters around the United Kingdom have been growing rapidly. These charts are an attempt to provide the mariner with a quick easy reference to the essential information he requires with regard to radio communications, navigational aids and procedures connected with radio-telephony.

The chart under review covers the area Brest to the Elbe and depicts an outline of the United Kingdom from Milford Haven, round the south coast to the Humber and the continental coast from Brest to the Elbe. On the chart, in their approximate locations, are all the coastal radio stations by name with a box underneath giving symbols and abbreviated information and the services available. The major radiobeacons are indicated with their call signs, frequency and sequence numbers. Areas under radar coverage are also indicated. Traffic control centres and port radio stations are shown giving their operational hours, VHF channels and broadcast information services. In the appropriate locations of the chart approach information for the major ports, river estuaries and traffic routeing systems is given. The major ports are indicated by the letter P and on the reverse of the chart Port Checklists are printed giving all the information required regarding ETA and Port Health messages together with the port and pilot radio facilities. Also on the back are the French Regulations for Tankers, German Regulations for vessels carrying dangerous cargo and details concerning the English Channel reporting system.

Most of the information on the charts is available in various other publications, i.e. *Admiralty Pilots*, *Lists of Radio Stations*, local harbour regulations, etc., but it can be time-consuming to check what is needed. The information on the chart does not replace official sources but is intended to assist experienced and qualified mariners. The ROFAC chart will, from time to time. need correcting as the information goes out of date or is changed. These corrections may be obtained by applying to the suppliers, J. D. Potter Ltd, 145 Minories, London EC3N 1NH. A ROFAC Service is offered to users who wish to keep abreast of changes to the chart in the easiest possible way. The service offers two completely up-to-date charts per year plus two correction bulletins. Further details of this service can be obtained from the suppliers above.

The chart would be of considerable value to regular traders to the areas covered. However, in your reviewer's opinion there is some doubt as to the readability at night of the information on the chart in the subdued lighting on a ship's bridge—a problem which may become aggravated if the Post Office continues to establish further VHF radio stations and the chart thus becomes more crowded with information.

C.R.D.

Lloyd's Nautical Year Book 1980. 210 mm × 135 mm, pp. 608. Lloyd's of London Press Ltd, London EC3M 7HA. Price £6·50.

Under its old title of *Lloyd's Calendar* this book was familiar to most mariners and could be found in the chartroom bookcase of almost every ship. In 1978 the title was changed to *Lloyd's Calendar and Nautical Year Book;* in 1979 it became *Lloyd's Nautical Year Book and Calendar* and this year, *Lloyd's Nautical Year Book*. This is not change for changes sake. The book is the annual maritime almanac and is a valuable reference volume full of important facts and features vital to everyone concerned with the sea, either commercially or as a seafarer.

Essentially, the book retains its familiar format but to overcome the danger of the text becoming stagnant the 1980 edition has been revised to take in the latest developments to make it an even more valuable work of reference and to ensure that it lives up to its name of a 'Year Book'. Six new articles covering a wide spectrum of nautical affairs have been included and the book has been divided into self-contained sections for easy reference. These are Lloyd's Sections containing its history, tradition and service together with lists of Brokers and Agents; Cargo Carriage and Salvage giving an insight into these fascinating subjects; a comprehensive guide to the maritime organisations of the United Kingdom; general articles of a historical and technical nature; a Safety at Sea section giving details of the United Kingdom meteorological services for shipping, AMVER, Trinity House, RNLI, HM Coastguard and the Collision Regulations, and Tables containing all the regular data which have helped to build the Year Book's reputation as an indispensable reference volume.

The writer reviewed the 1978 edition of this book in the April 1978 edition of this journal and offered two criticisms. One that some of the artwork in the book was none too clear—a fault that has now been rectified, the other doubting the value of the Table of the Points of the Compass and their Angles with the Meridian to the modern mariner—which, for reasons best known to the editor, has been retained. Nevertheless, the editor states in his Preface that he would be grateful if shipowners, masters and others would make suggestions for improving the book.

C.R.D.

SUGAR LINE LIMITED

With the withdrawal of our instruments from the *Sugar Carrier* prior to the vessel being sold last November, the association between the Meteorological Office and Sugar Line came to an end.

The first Sugar Line vessel, the *Crystal Bell*, was recruited into the Voluntary Observing Fleet in May 1958 and, thereafter, all the Company's ships rendered very valuable voluntary service to the Meteorological Office. During the early 1960s, in addition to the usual surface weather observations, Sugar Line vessels carried out evaluation trials of the reception of radio weather facsimile charts on board ship and between the years 1968–73 the *Sugar Exporter* and *Sugar Producer* were equipped to make upper-air observations by radiosonde. Sugar Line vessels were also the first British ships to be fitted with distant-reading meteorological equipment.

Throughout the 21 years of our association with Sugar Line, the Marine Division of the Meteorological Office received the utmost co-operation from the Company's staff both afloat and ashore. We remain deeply grateful to all concerned and offer our best wishes in their future activities.

Personalities

OBITUARY.—It is with deep regret that we record the sudden death of CAPTAIN C. L. EARL onboard his ship the *Ravenswood* on 12 September 1979.

Charles Earl joined Royal Mail Lines as a cadet in 1948. On obtaining his 2nd Mate's Certificate in 1952 he was appointed 4th Officer of the *Highland Chieftain*. After steady promotion, he served for 2 years as Chief Officer in the *Drina* until he transferred to Shaw Savill Line in 1965. He was promoted to Master in January 1968 and appointed to command of the *Delphic*. Later he commanded *Amalric*, *Canopic*, *Carnatic* and *Cretic* including 4 years in command of *Cedric* from March 1972 to March 1976.

We received the first meteorological logbook bearing Captain Earl's name from the *Andes* in 1951. Thereafter he sent us a further 37 logbooks of which 16 were classed as Excellent. He received Excellent Awards in 1955 and 1967.

We extend our sincere condolences to his family.

RETIREMENT.—CAPTAIN G. E. BENNISON retired on 30 September 1979 after completing 35 years with Shell Tankers (UK) Limited.

George Bennison joined Anglo-Saxon Petroleum Company in 1944 as an Apprentice and was appointed to m.v. *Cardium*. After promotion through the ranks he obtained his Master's Certificate in January 1953. He was promoted to Master in 1966 and appointed to command the *Haminea*.

From December 1973 to April 1975 Captain Bennison held a shore appointment with Shell Tankers and, on his return to sea, commanded the *Methane Progress*.

Captain Bennison sent us his first meteorological logbook from the *Helicina* in 1948. Since then we have received a further 31 logbooks bearing his name. He received an Excellent Award in 1974.

We wish him a long, healthy and happy retirement.

RETIREMENT.—Mr J. T. W. MOODY, Radio Officer, retired on 15 October 1979 after 43 years service with Marconi International Marine Company.

John Moody served on a variety of vessels up to September 1956 when he joined the *Calegaria*, owned by Donaldson Line, and completed 58 consecutive voyages in that ship until April 1963. He then served on board vessels of the Bristol

City Line for a number of years. Mr Moody completed his last voyage on the *Avon Forest* in March 1979.

We received the first meteorological logbook bearing Mr Moody's name from the *Dorelian* in 1951 and, thereafter, a further 40 logbooks of which no less than 30 were classed as Excellent. He received Excellent Awards in 1955, 1956, 1957, 1960, 1965, 1966, 1967, 1968, 1969, 1970 and 1971.

We wish him a long, healthy and happy retirement.

RETIREMENT.—Mr B. J. McGovern, Radio Officer, retired on 31 October 1979 after 43 years service with Marconi International Marine Company.

Bernard Joseph McGovern was born on 26 October 1916 and joined the sea staff of Marconi as Radio Officer in December 1935. On his sixth consecutive voyage in the *Somersby* in May 1941, the vessel was sunk by enemy action. In 1948 Mr McGovern joined the *Port Phillip* and completed 20 consecutive voyages in that vessel. He was then appointed to the *Gothic* where he served for a total of 35 voyages. Since 1974 he has been serving in the ferry *St Patrick.*

The first meteorological logbook bearing Mr McGovern's name was received from the *Port Phillip* in 1949. Since then we have received a further 46 books of which 34 were classed as Excellent. He received Excellent Awards in 1949, 1953, 1957, 1958, 1959, 1960, 1961, 1962, 1964, and 1969.

We wish him a long and happy retirement.

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