Met.O. 894

# The Marine Observer

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# THE MARINE OBSERVER

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

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# Report of Work for 1975

## (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*) 508 Selected Ships, including 8 trawlers, which are supplied with a full set of meteorological instruments on loan and which make observations in code every six hours and transmit them to the appropriate coastal radio station wherever their voyages take them.

(*b*) 36 Supplementary Ships, including 12 trawlers, which make less-detailed observations than Selected Ships and are supplied on loan with only a barometer, air thermometer and screen. They use an abbreviated code for their messages.

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

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

(*e*) 15 trawlers which make non-instrumental observations only and transmit them by W/T or R/T, using an abbreviated code, to radio stations in the U.K., Canada, Iceland, Norway or U.S.S.R. depending on the area in which they are fishing. In addition to these, 8 trawlers now figure in the Selected Ships' List and 12 in the Supplementary Ships' List.

(*f*) 8 Auxiliary Ships which make and transmit visual observations similar to those made by trawlers, with the addition of pressure and air temperature readings from the ships' own instruments (using the 'Shred' code). These ships do this work only when in areas where shipping is known to be sparse.

Throughout the year, the number of recruitments of Selected Ships has almost balanced the considerable wastage due to ships being sold or laid up for long periods. The number of observations received has, nevertheless, increased since the larger container and bulk-carrier-type vessels spend more time at sea than their predecessors and are therefore able to make a greater contribution of observations.

Most of the effort of maintaining the strength of the fleet devolves upon the six Port Meteorological Officers at Glasgow, Liverpool, Hull, Cardiff, Southampton and London. These will be augmented by the establishment in the near future of a new Port Meteorological Office on the Tyne. Since the resignation of the Merchant Navy Agent in May 1973, this area, of necessity, has been rather spasmodically served by the Liverpool Office. Despite retirements and consequent changes in personnel the Port Meteorological Officers have diligently continued their recruitment and general liaison work of mutual benefit to the Meteorological Office and the various shipping interests.

Almost all meteorological work in British merchant ships is carried out on a voluntary basis and it is our pleasant duty to report that standards of observing have been, in general, well maintained throughout the year. Where a deterioration has been noticed, and there have been very few instances, it has almost invariably been found in ships now sailing with one deck officer fewer than previously. It is hoped that the policy of installing distant-reading marine meteorological instruments, which help to lighten the task of observing officers, will tend to alleviate this problem. Consequently the fitting of distant-reading equipment has continued in newly built or refurbished ships. It is gratifying to note that shipowners approached in this connection have been very co-operative even to the extent that, in some cases, the initiative has come from the owners themselves. This is a situation which very favourably reflects the relations between the Meteorological Office and the shipping industry through the medium of Port Meteorological Officers.

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

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

| | | | |
|---|---|---|---|
| Europe | 32 | West Indies | 29 |
| Australasia | 54 | South America | 18 |
| Far East | 86 | Pacific Coast of North America | 9 |
| Persian Gulf | 28 | Falkland Islands and Antarctic | 2 |
| South Africa | 30 | World-wide 'tramping' | 130 |
| West Africa | 18 | Near and distant-water fishing grounds | 20 |
| North Atlantic | 67 | | |

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

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

**Table 2. Total number of reports received at Bracknell by various sources from ships during two typical days in 1975**

| | *JUNE* | *NOVEMBER* |
|---|---|---|
| Direct reception from | | |
| British ships in eastern North Atlantic | 112 | 127 |
| Foreign ships in eastern North Atlantic | 85 | 94 |
| British ships in North Sea | 20 | 9 |
| Foreign ships in North Sea | 11 | 7 |
| British ships in other waters | 0 | 1 |
| Total | 228 | 238 |
| Via other European countries | | |
| Ships in eastern North Atlantic | 291 | 368 |
| Ships in Mediterrranean | 48 | 66 |
| Ships in North Sea | 88 | 101 |
| Ships in Pacific | 0 | 0 |
| Ships off northern Russia | 24 | 22 |
| Ships in other waters | 189 | 139 |
| Total | 640 | 696 |

| | | |
|---|---|---|
| Via North America | | |
| Ships in North Atlantic | 604 | 624 |
| Ships in North Pacific | 714 | 622 |
| Ships in other waters | 152 | 304 |
| Total | 1470 | 1550 |

## 2. Ocean Weather Ships

As a consequence of the termination of the International Civil Aviation Organization (ICAO) Joint Financing Agreement on North Atlantic Ocean Stations on 30 June 1975 the U.K. ceased to operate weather ships on stations 'India' and 'Juliett'. From 1 July 1975 and pending the ratification of a new North Atlantic Ocean Station (NAOS) Agreement to be termed the WMO Joint Financing Agreement, NAOS Operating States have operated a network of ocean weather stations in the central and eastern North Atlantic. The network consists of the following stations:

| | | |
|---|---|---|
| 'Charlie' | Lat. 52° 45'N Long. 35° 30'W | Manned by U.S.S.R. ships |
| 'Lima' | Lat. 57° 00'N Long. 20° 00'W | Manned by U.K. ships |
| 'Mike' | Lat. 66° 00'N Long. 2° 00'E | Manned by Norwegian/Swedish and Netherlands ships |
| 'Romeo' | Lat. 47° 00'N Long. 17° 00'W | Manned by French ships. |

The alteration in the U.K. operating commitment to the NAOS network from two to one ocean stations reduced the U.K. requirement for weather ships from four to two vessels and it also afforded the opportunity to make arrangements to refurbish two of the existing four ex-'Castle'-class frigates to extend their service to 1981. These ships were built in 1944 for the Royal Navy and have provided a satisfactory service since their conversion to weather ships in 1958–60 but, owing to natural consequence of age, repair and maintenance costs continue to mount and the accommodation requires a full program of modernization. The ships selected for possible refurbishment are *Weather Adviser* and *Weather Monitor* whereas *Weather Reporter* and *Weather Surveyor* will man station 'Lima' until the refurbished vessels return to service, or the present interim operations cease. Prior to the termination of the ICAO Agreement all U.K. weather ships provided communication and navigational facilities for transatlantic aircraft and air–sea rescue equipment was kept in constant readiness. After 1 July all aviation commitments were discontinued although the ships continue to keep a listening watch on the aircraft distress frequency of 121·5 MHz. The weather ships make hourly surface and six-hourly upper-air observations which are transmitted direct to the Meteorological Office, Bracknell. The following additional observations were made at regular intervals by British weather ships: solar radiation, sea temperature and salinity to considerable depths, magnetic variation and surface sea-water sampling. The biological sampling program for the Institute for Marine Environmental Research was continued until June. The Longhurst/Hardy plankton recorder was used during this sampling program to determine the vertical distribution of plankton in the upper 500 metres of the ocean at Station 'India'. For this duty a marine biologist from the Institute made several voyages to the station. In association with this investigation into the plankton hauls, water samples for phytoplankton analysis were taken and extra net hauls for analysis of toxic residues in the plankton were made. The Marine Aerosol Sampling Program was concluded during the late summer; this was a project undertaken in co-operation with the Royal Navy (National Gas Turbine Establishment, Naval Marine Wing) to obtain and analyse air samples for salt-particle content.

### 3. Ship Routeing

The Marine Division continued to provide a ship-routeing service to advise on North Atlantic and North Pacific passages and to offer advice in regard to the movement of tows. In the case of cargo vessels the object of the service is to select the best course for a ship to steer in order to reach its destination in the shortest time with the least damage to hull and cargo, and with the most economical fuel consumption. The vessel's response to various wave-fields is determined by extracting sufficient data from the deck log books and a ship/wave performance curve is constructed. Wind and sea-wave predictions at intervals of 12 hours for up to 72 hours ahead are supplied to the ship routeing officers by forecasters of the Central Forecasting Office and this information, in conjunction with the performance curve, is used to determine the most favourable course for the vessel to follow. Consideration is also given to the loading state of the ship, to surface currents, navigational hazards such as shoals, ice, and to areas of fog.

Communication with the vessel is usually by telex before sailing and via predetermined coastal radio stations when the ship is on passage. The provision of routeing advice to tows which do not have too restrictive weather parameters is similar to that for conventional ships but allowance has to be made for the slower speed of the tow and for their reduced manœuvrability. In the case of tows with limiting weather factors, which may be wave height, amount of heel or wind force, the routeing service advises when and where to seek shelter and when to resume the passage.

About 200 conventional routeings were made during the year, and although the service for tows only began in the autumn, requests for this type of routeing service have been increasing considerably.

### 4. Services for Marine Activities

General services to shipping are provided via BBC Radio and the Post Office coastal radio stations. Every day four bulletins are broadcast on Radio 2 and two bulletins on coastal radio while gale warnings are broadcast as soon as possible after issue. Following discussion and consultation with all interested parties a number of changes were made in the format and content of the bulletins with a view to improving their value to the user. The most important concerned the coastal-station reports included in the bulletins broadcast on Radio 2. Two stations, Wick and Prestwick, whose reports are not entirely representative of conditions over the open sea, were replaced by two better-exposed stations, Sule Skerry and Malin Head. Again, to overcome the problem of the key station, Tiree, being omitted on those occasions when the bulletins are curtailed, the order of broadcast of the reports was changed to commence with Tiree, rather than Wick as before, and then clockwise through Sule Skerry, Bell Rock etc. Further, to meet the special requirements of yachtsmen, a report for Jersey was included in the 0033 and 0633 bulletins; unfortunately strict limitation on broadcasting time does not permit the inclusion of a Jersey report at other times of the day.

With regard to coastal radio stations, an additional station, Anglesey, was brought into the scheme to improve the coverage over the Irish Sea; a general synopsis was included with the sea area forecasts; the sea area forecasts broadcast by Niton Radio were extended to include Thames, Dover, Portland and Wight on both R/T and W/T channels; transmissions on VHF were introduced, broadcast simultaneously with the R/T transmissions; gale cancellation messages were initiated to prevent the repeat broadcast of warnings which are outdated, and transmission procedures were streamlined in order to avoid delays in passing messages from the Office to the coastal radio stations.

**5. Inquiries**

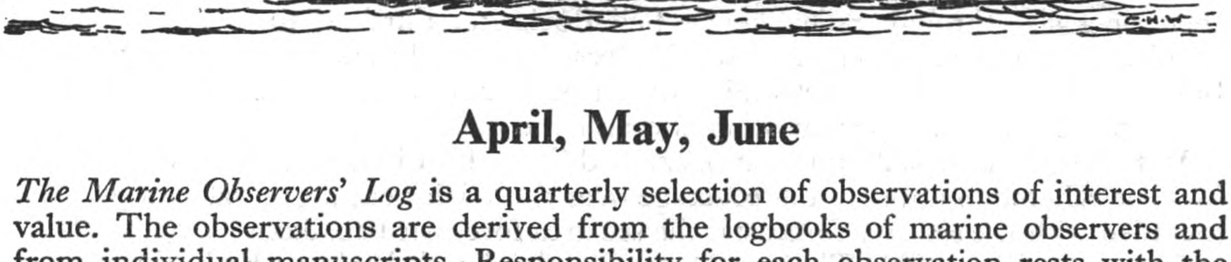
The number of marine inquiries has continued to rise and the total for this year has exceeded that of 1974 which was itself a record year. The inquiries are mainly from official organizations, solicitors, insurance companies, shipping interests, universities and industrial firms in the British Isles. However, a large number of inquiries are received from other countries including the U.S.A., France, The Netherlands, Germany, Italy, Sweden, Canada, Liberia, Israel and Greece. The subjects of inquiries are extremely varied, including questions on rollers at St Helena in 1862 (from an American professor), a ship lost in the South Pacific in 1906, and, more commonly, salvage, as in the case of a very large ore-carrier aground on the Casquet Rocks off Guernsey for 3 months.

**6. Awards to Voluntary Observing Ships**

In recognition and appreciation of their contribution to international meteorology, books were again awarded to the masters, principal observing officers and senior radio officers who had been responsible for sending in the 100 best meteorological logbooks during the year. Similar awards were made to masters and officers of vessels on the short sea trades ('Marid' ships) for their contribution in making sea-temperature observations and to trawler skippers and their radio officers who had the best records in making and sending non-instrumental observations from the fishing regions. The books selected for these awards were *The University Atlas*, *The Concise Oxford Dictionary*, and *A History of Polar Exploration* by David Mountfield.

Barographs were again presented to shipmasters whose observations over many years have consistently achieved high standards of excellence.

# 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 U.K. will supply bottles, preservative and instructions on request.

## TROPICAL STORM 'AGATHA'

### North Pacific Ocean

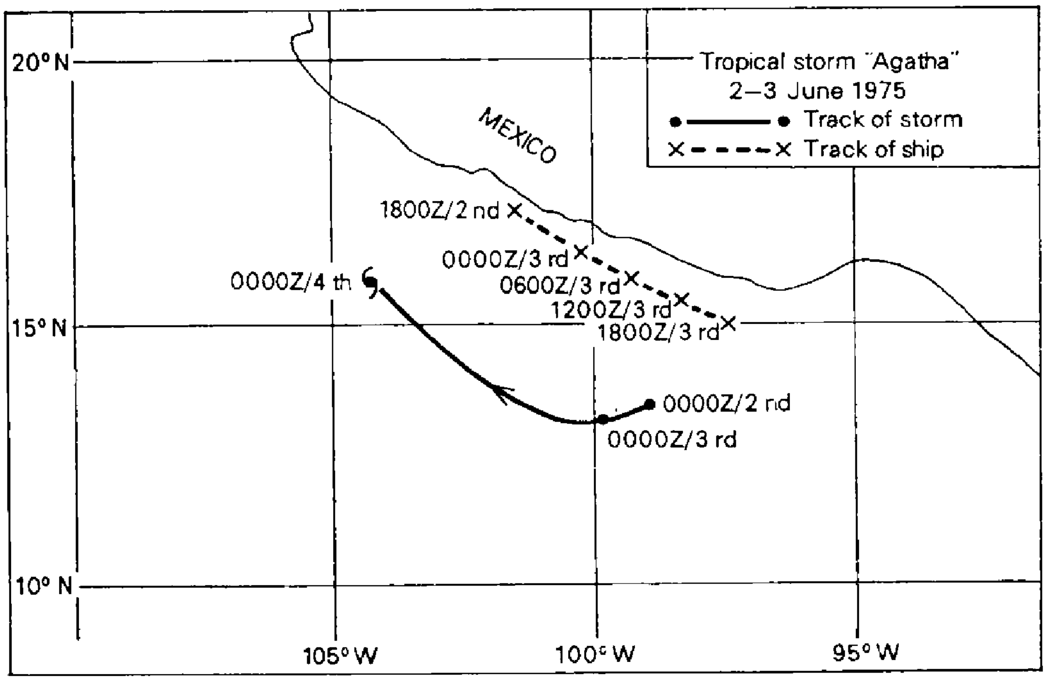
m.v. *Fresno City.* Captain R. I. Crawford. Watson Island to Panama. Observers, the Master and ship's company.

2–3 June 1975. Between 1800 and 2000 GMT on 2 June the wind veered from NW to SE and increased from force 4 to force 8. During the next 22 hours the wind direction varied from ESE to SE, between 30 and 40 knots with gusts to 60 knots at times. A short steep ESE'ly swell of about 4 to 5 metres was encountered and, due to this, the vessel's speed was reduced.

During the period there were numerous line-squalls of approximately 3·5 n. mile long and a cable or so in depth. Visibility throughout was continually impaired by heavy rain and spray.

The following observations were made whilst the vessel was in the vicinity of Agatha.

| | GMT | |
|---|---|---|
| 2nd | 1800: | Position of ship: 17° 06'N, 101° 24'W. Wind NW, force 4. Pressure 1006·4 mb. Overcast with slight drizzle. Visibility 11 n. mile. |
| 3rd | 0000: | Position of ship: 16° 24'N, 100° 06'W. Wind E's, force 8–9. Pressure 1001·2 mb. Overcast with continuous slight rain. Visibility 5 n. mile. |
| | 0600: | Position of ship: 15° 54'N, 99° 06'W. Wind ESE, force 8. Pressure 1005·6 mb. Overcast with rain during the last hour. Visibility 11 n. mile. |
| | 1200: | Position of ship: 15° 30'N, 98° 18'W. Wind ESE, force 5. Pressure 1007·6 mb. Overcast with continuous heavy rain. Visibility 5 n. mile reducing to 50 metres in rain squalls. |
| | 1800: | Position of ship: 15° 00'N, 97° 24'W. Wind ESE, force 5. Pressure 1009·8 mb. Overcast with moderate/heavy rain showers. Visibility 5 n. mile. |




*Note.* The storm was identified on 1 June, moving slowing WSW and deepening. By 0600 GMT on the 3rd, the time of closest proximity to the *Fresno City*, it had turned WNW and intensified into a tropical storm. Agatha accelerated and continued to deepen so that by midnight on 4 June the winds had reached hurricane force near the centre. The *Fresno City* and the hurricane were on opposite headings, however, and the weather experienced by the ship slowly improved. Agatha subsequently continued NW'wards, weakening slowly.

## INTENSE DEPRESSION

### Tasman Sea

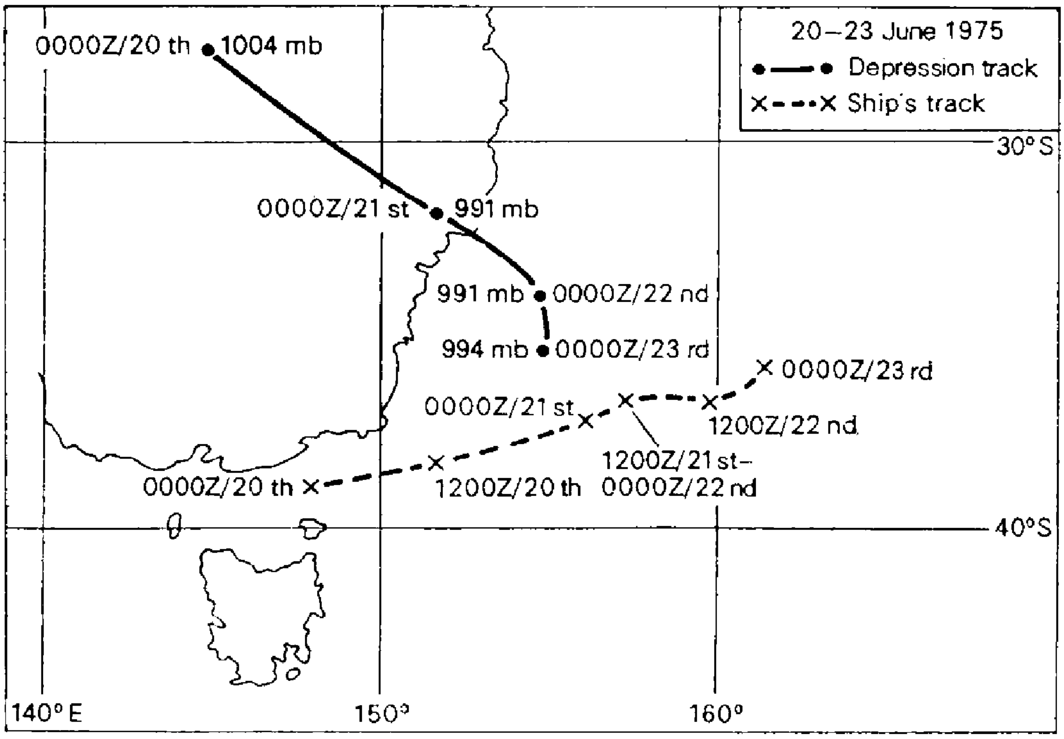
m.v. *Illyric*. Captain H. Nixon. Port Phillip to Whangarei, New Zealand. Observers, the Master, Mr M. J. Rudd, 3rd Officer and ship's company.

21–22 June 1975. At 0000 GMT on 21 June the vessel was steaming into gradually deteriorating weather. In the previous 4 hours the barometer had fallen 2·6 mb, the wind had increased to force 9, the visibility had fallen to 5 n. mile and the sea had become rough with a heavy swell. The vessel's speed had been reduced to avoid excessive pounding. The weather analysis issued at this time showed a depression of 992 mb centred over Sydney some 350 n. mile NW of the *Illyric*.

During the next 4 hours the wind increased to force 10 with a very rough sea and very heavy swell. Visibility was affected by driving spray.

The following are selected extracts from the meteorological logbook:

| | GMT | |
|---|---|---|
| 21st | 0000: | Wind ESE, force 9. Pressure 1009·0 mb. Overcast with slight drizzle. Visibility 5·5 n. mile. |
| | 0600: | Wind E'ly, force 12. Pressure 1004·0 mb. Overcast. Blowing spray. Visibility 0·25 n. mile. |
| | 1200: | Wind E'ly, force 12. Pressure 1001·8 mb. Overcast. Blowing spray. Visibility 0·25 n. mile. |
| | 1800: | Wind E'ly, force 12. Pressure 1001·1 mb. Overcast. Blowing spray. Visibility 0·25 n. mile. |
| 22nd | 0000: | Wind E'ly, force 11. Pressure 1001·7 mb. Overcast with intermittent moderate rain. Visibility 1 n. mile. |
| | 0600: | Wind E'ly, force 10. Pressure 998·3 mb. Overcast, precipitation within 3 n. mile. Visibility 0·5 n. mile. |
| | 1200: | Wind E'ly, force 8. Pressure 998·7 mb. Overcast with intermittent heavy rain. Visibility 1 n. mile. |
| | 1800: | Wind E'ly, force 7. Pressure 997·7 mb. Partly cloudy with precipitation beyond 3 n. mile. Visibility 5·5 n. mile. |



The *Illyric* was hove-to from 0500 on 21 June until 0700 on 22 June during which time the vessel was pounding and rolling heavily, and great difficulty was experienced in holding the ship's head up into the wind.

The weather analysis issued at 0000 GMT on 21 June showed the depression, central pressure 993 mb, situated approximately 150 n. mile NNW of the *Illyric* and that the vessel had just passed through an associated occlusion. On this analysis the 1000- and 1005-mb isobars were nearly touching.

Position of ship at 0000 GMT on 21 June: 37° 24′S, 156° 12′E.

Position of ship at 1200 GMT on 22 June: 37° 00′S, 159° 42′E.

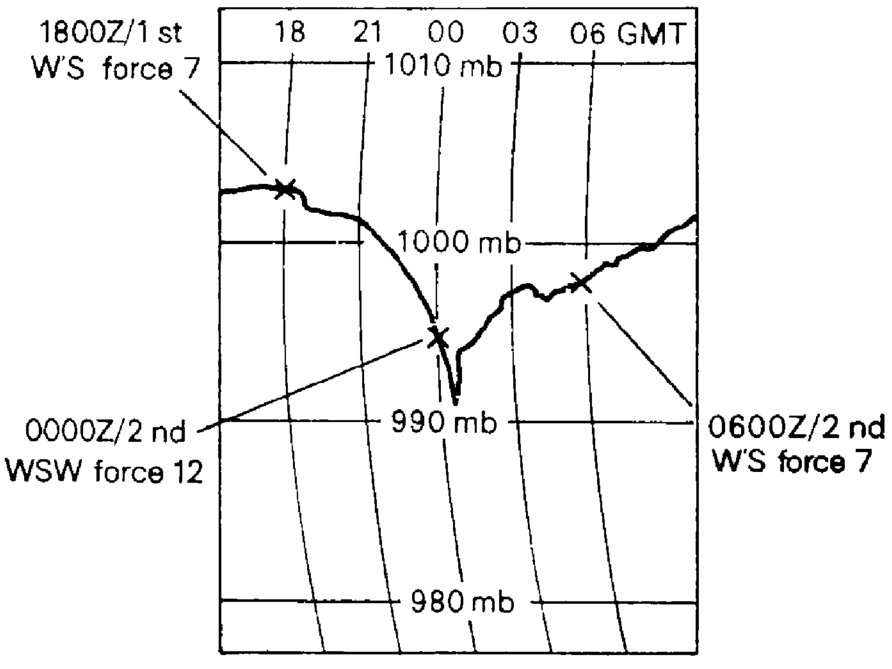
*Note.* The accompanying chart shows the tracks of the *Illyric* and of the depression. During 21 June the centre of the depression was heading towards the almost stationary ship. Fortunately, on the 22nd the depression turned southwards, slowed and began to fill, sparing the *Illyric* more prolonged severe weather.

## DEPRESSION

### North Pacific Ocean

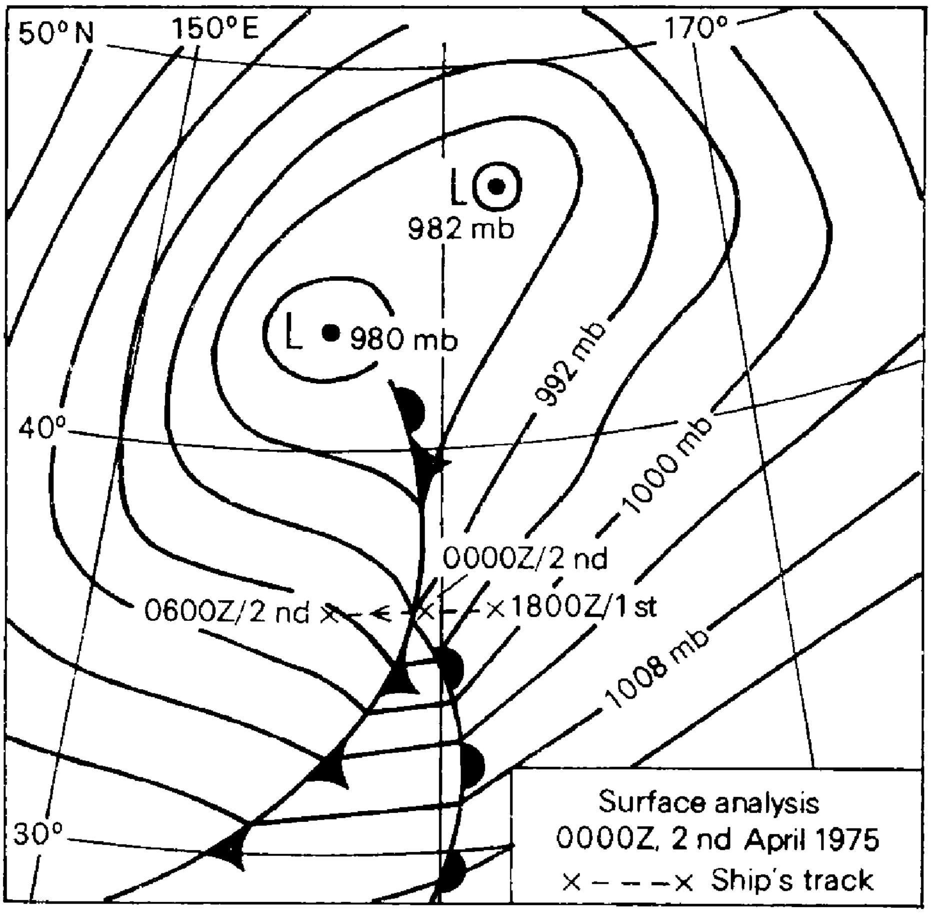
s.s. *Liverpool Bay*. Captain D. H. Stewart. Balboa to Tokyo. Observers, the Master and all officers.

1–2 April 1975. At 2330 GMT on 1 April the barometer, which had been falling steadily, began to fall rapidly. The wind, which had been SW force 7, increased to force 9. The vessel ran into moderate to heavy rain which was observed to extend to 28 n. mile on the radar. By 2350 the barometer had fallen 7 mb in almost as many minutes and the wind had increased to force 10. By 0000 on 2 April the barometer had fallen 8 mb in the past 45 minutes, the wind had veered to WSW and was then force 12 and the vessel was passing through a line of very heavy rain, some six n. mile wide. The sea was completely white with spindrift. At 0005 the vessel entered what appeared to be the final band of rain. At 0007 the vessel emerged from the rain, the barometer immediately rose 3·5 mb, the wind dropped to force 7 and veered slightly. The low stratus fractus cloud gave way to cumulonimbus. At 0039 the rain ceased and the sky brightened.



The following observations were made:

| | GMT | |
|---|---|---|
| 1st | 1800: | Position of ship: 36° 00′N, 161° 18′E. Wind W'S, force 7. Pressure 1002·8 mb. Partly cloudy. Visibility 11 n. mile. |
| 2nd | 0000: | Position of ship: 36° 00′N, 159° 18′E. Wind WSW, force 12. Pressure 994·1 mb. Overcast with continuous heavy rain. Visibility 1 n. mile. |
| | 0600: | Position of ship: 35° 54′N, 156° 42′E. Wind W'S, force 7. Pressure 997·5 mb. Partly cloudy with moderate or heavy rain showers. Visibility 11 n. mile. |




*Note.* The *Liverpool Bay* encountered a frontal system associated with a complex depression over the western North Pacific Ocean. The midnight surface analysis shows an occlusion with a very sharp isobaric trough rapidly crossing the ship's position on the opposite heading. Note the proximity of the system's triple point where cold and warm fronts merge, usually the area of most severe weather.

## LIGHTNING

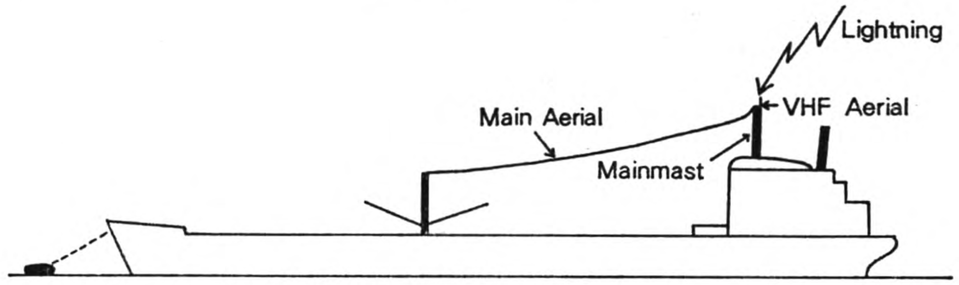
### VESSEL STRUCK BY LIGHTNING

### at Forcados, Nigeria

s.s. *Opalia.* Commodore R. Lumsden. In port. Observers, Mr P. A. S. Markland, 3rd Officer and the ship's company.

21 June 1975. At 0800 GMT, while the *Opalia* was tied-up at 'Single Buoy Mooring' No. 2, a heavy squall approached, giving heavy rain with thunder and lightning. The wind also increased and backed. At 0810, during the passage of the squall, the ship's signal mast on top of the monkey island was struck by the lightning.

The vessel was felt to shake at the instant of impact. This shaking was extremely pronounced and was commented on by personnel throughout the ship. Confirmation of the strike was made apparent when the VHF aerial on top of the mast was inspected and found to have been partly destroyed.




By 0830 the squall had passed and the cloud was dispersing.
Position of ship: 5° 26′N, 5° 26′E.

### South Pacific Ocean

s.s. *Ocean Monarch*. Captain B. A. Hills. Western Samoa to Fiji. Observers, Mr R. E. V. O'Donnell, 3rd Officer and Mr P. C. Waiton, Cadet.

10 April 1975. At 0700 GMT the ship was cruising on a course of 243°T through generally clear conditions with very scattered small clumps of cumulus when a large cumulonimbus cloud was noticed leading from the western end of Savai'i Island seawards. This cloud was surrounded by towering cumulus, altocumulus and other forms of medium-level cloud and, electrically speaking, was very active, there being on average one flash of lightning every 15 seconds. Also, the interior of the cloud appeared to be under an almost continuous electrical barrage with the dome of the cloud never being completely blacked-out and giving the appearance of being strung with white 'Christmas-tree' lights.

The visible lightning took on many forms. Noted at various times were: a perfect 'Aries' shape, a dead-straight vertical line, a horizontal line, a 'Z' and various other alphabetical characters and what, at one instant, appeared to be a 'dollar' sign—in fact the two observers were so intrigued by the display being put on for them by 'Mother Nature' that they were reprimanded by the Master for not keeping a proper lookout ahead.

Towards the end of the watch the cloud was very near the NE horizon and seemed to be decreasing in activity. The display finished at approximately 1045 although the loom of lightning was still noted after 1100 GMT. Air temp. 27·9°C, wet bulb 25·9, sea 31·7. Wind SE'ly, force 3–4.

Position of ship at 0700; 13°49′S, 172°12′W.

## DISCOLOURED WATER

### North Atlantic Ocean

m.v. *Lutetian*. Captain F. C. Richardson. Port Kelang to Antwerp. Observers, the Master, Mr D. F. Norman, 2nd Officer and Mr S. Woodward, 3rd Officer.

27 May 1975. At 1300 GMT the vessel passed through large areas of discoloured water. The discoloration took the form of large dark greenish-brown patches. A sample was taken and retained on board to be forwarded to the appropriate experts on the vessel's arrival in the U.K. It was subsequently handed to the Port Meteorological Officer in Glasgow on 9 June, who in turn sent the sample to the Institute of Oceanographic Sciences.

Position of ship: 7°00′N, 16°00′W.

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

'A sample of discoloured water has been forwarded to me by the Port Meteorological Officer, Glasgow, from the *Lutetian*, and was associated with a dark green/brown discoloration of the sea recorded in the vessel's meteorological logbook. It contains a great number of specimens of the diatom *Rhizosolenia imbricata* and the vessel was clearly traversing a local bloom of this tiny plant. It usually occurs in short chains of single cells, which readily separate, and under certain nutrient and daylight conditions may appear in dense enough concentrations to colour the water. Such blooms are usually rapidly grazed by the smaller planktonic animals, and do not last very long.'

## DOLPHINS

### Eastern North Pacific

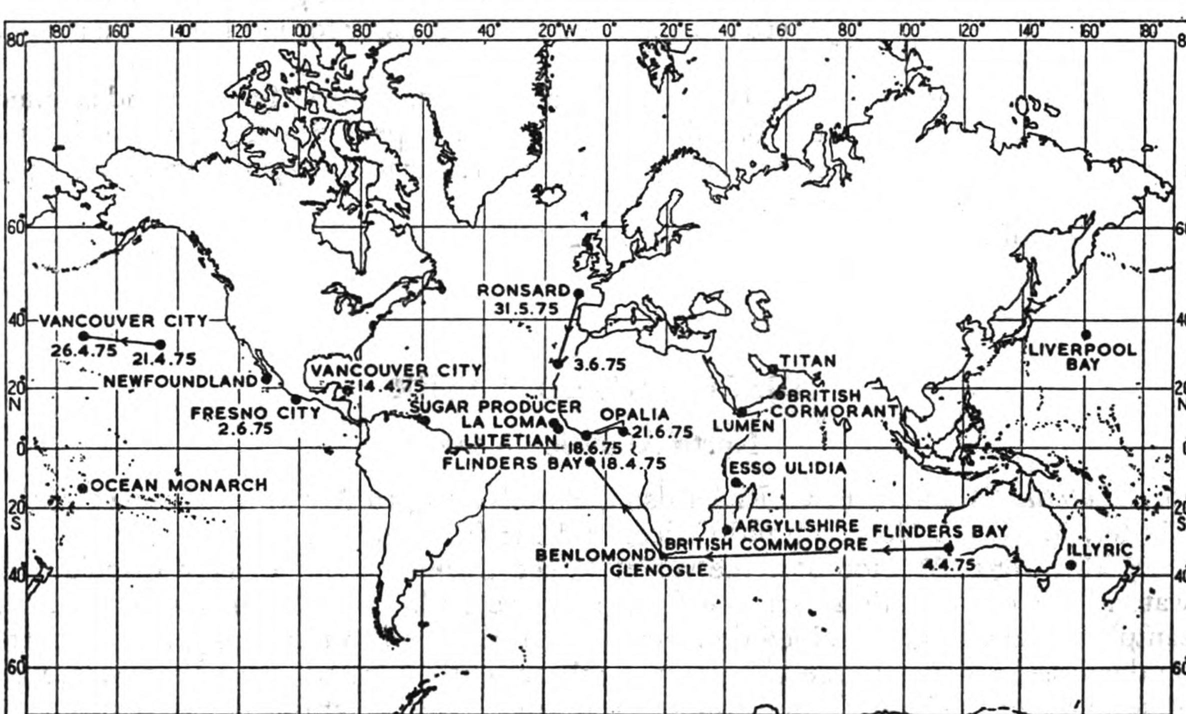
m.v. *Newfoundland.* Captain C. Rowntree. Manzanillo, Mexico to Los Angeles. Observers, Mr S. J. F. d'Arcy, Chief Officer, Mr E. F. Giles, 3rd Officer and most of the ship's company.

18 May 1975. Between 1400 and 1545 GMT, while experiencing the cold Californian Current off Baja (sea temp. 16·5°C), the vessel was surrounded by what became many hundreds of Californian dolphins. They were dark grey on the back with lighter grey under the belly, some up to 3 metres in length and all wearing a 'perpetual grin'.

The dolphins approached from considerable distances and with great speed to converge on the ship, diving under the hull usually amidships and reappearing languidly in the wake. They then showed no further interest in, or inclination to follow, the ship. Many of these dolphins were accompanied by their young, some of which were less than a metre in length; every manœuvre carried out by the adult female (?) was exactly duplicated by the young, who never moved more than one metre away from the parent, swimming alongside.

Some of the adults took advantage of the bow wave, leaping high in the air and falling on their backs with a loud report, possibly in an attempt to rid themselves of parasites etc.

Approximate position of ship: 23° 30′N, 111° 15′W.




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

# MARINE LIFE

## Southern North Atlantic

s.s. *La Loma*. Captain A. M. Valentine, Lisbon to Persian Gulf. Observers, Mr A. P. Tucker, 2nd Officer, Mr M. G. Phipps, 3rd Officer and ship's company.

4 April 1975. At about 0745 GMT, the weather being sunny and clear with a calm sea, a vivid discoloration—bright pink/red—was sighted in the water ahead. On approaching it was found to be a phenomenal shoal of 'jellyfish', the bodies of which seemed to be inflated, enabling them to drift with the wind. The reddishness of the water lasted until midday—some 48 n. mile.

At the approximate centre of the shoal there was a very dense area some 15 n. mile long by 3 n. mile wide with the axis running in a south to north direction. As the vessel traversed this patch it seemed as if the whole area was covered in sponge rubber or similar material and it was a most remarkable sight. At one stage no part of the sea could be seen which was not discoloured—no mean occurrence considering that the height of the bridge was 36 metres. Air temp. 27°C, sea 20·5. Wind N'ly, force 1. Course 142°T.

Position of ship at 1030 GMT: 8° 20'N, 17° 05'W.

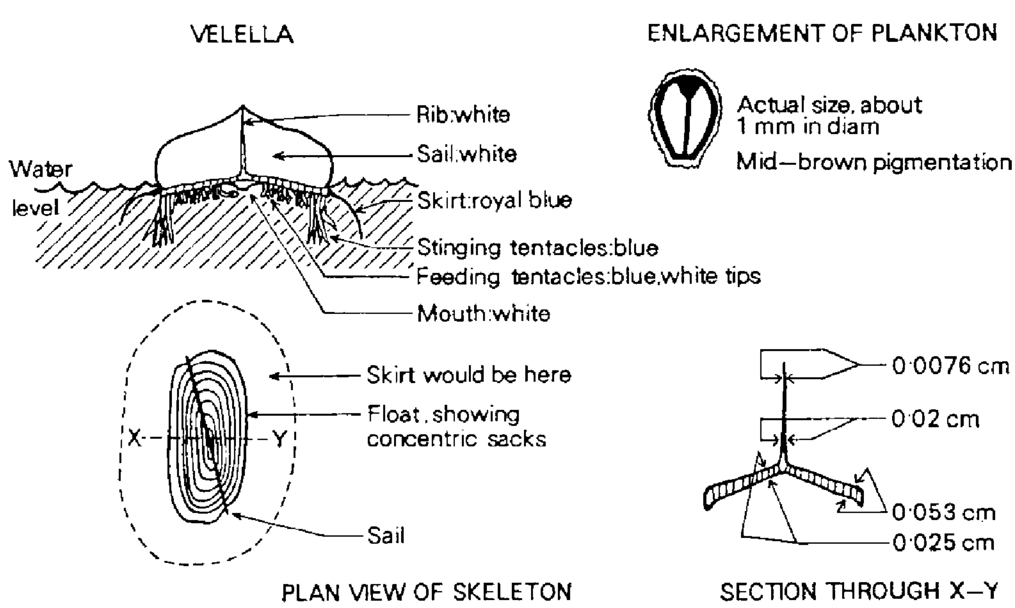
*Note.* Dr P. F. S. Cornelius, Head of the Coelenterate Section, Department of Zoology, British Museum (Natural History), comments:

'The density of Portuguese men-of-war (*Physalia*) described by the *La Loma* seems to have been quite exceptional. I do not know of another report where the *Physalia* were so close together that the sea could not be seen between them.'

## North Pacific Ocean

m.v. *Vancouver City*. Captain T. W. D. John. Japan to Panama Canal. Observers, the Master, Mr J. Sharples, 1st Officer, and family, Mr R. G. Hayton, 2nd Officer and Mr J. Neale, Cadet.

During the period 21–26 April 1975, the vessel passed through many thousands, even millions, of 'by-the-wind sailors' (*Velella*). They were seen in small detached groups and in huge tightly-packed congregations. The vessel was taking spray at the time and many were left stranded on deck. Several were taken alive and observations were made of them as well as of the skeletal remains of others. Body lengths




varied between 2 and 6 cm and they had a royal blue skirt 1·1 cm wide around the periphery (see sketches). Taken in more detail, an average skeleton's dimensions were: length 3–5 cm, width 1·5 cm, height of sail (which had a single vertical rib down the centre) 1·4 cm with a diagonal length of 3·2 cm, and the thickness of the sail tapering from the base towards the top. The float was concave with approximately 15 concentric sacs diminishing in size towards the centre. The texture and appearance of the skeleton was that of a sheet of polythene.

When the live *Velella* were turned over, the mouth was plainly visible in the centre and they all appeared to be feeding happily on some form of plankton which was trapped in the shorter feeding tentacles (see sketches).

Position of ship at 0000 GMT 21st: 34° 00'N, 151° 12'E.

Position of ship at 1200 GMT 26th: 35° 36'N, 170° 48'W.

*Note.* Commenting on this report Dr P. F. S. Cornelius wrote:

'The size of this shoal of *Velella* seems to have been quite exceptional, even by Pacific standards.' He also added: 'Accounts of *Physalia* (Portuguese-man-of-war) and *Velella* (by-the-wind sailor) are available in A. C. Hardy's *The Open Sea: I. The world of plankton* (Collins, paperback and hardback) and in Miss A. M. Clark's article in *The Marine Observer*, April 1970.'

## BIRDS

### Eastern North Atlantic

m.v. *Ronsard*. Captain W. A. Wilson. Swansea to Las Palmas. Observers, Mr A. J. Brown, 2nd Officer, Mr D. Iggo, 3rd Officer and ship's company.

31 May–3 June 1975. At 1200 GMT on 31 May a swallow was observed to land on the forward masthouse. This was the first indication that the vessel had feathered 'stowaways' on board. Later the same day it was discovered that there were, in fact, two swallows and six racing pigeons on board. This set the Chief Officer thinking how much the ship should charge them for a passage to South America! The swallows found refuge in the Engineers' Duty Mess where the 3rd Officer caught them and took them to his cabin where they promptly went to sleep. The 3rd Officer later tried to feed the swallows with some bread and also some fresh 'mustard and cress' which he had been growing in his cabin. The birds, however, turned their heads away in apparent disgust. They also refused the water offered to them. During the whole of the period that they were on board they appeared not to eat anything. In the early morning of 3 June they left the ship and flew off in a westerly direction.

The officers could not get close enough to the pigeons to catch them but a white ring was observed to be attached to the left leg and a red ring to the right. They appeared quite content to roost on the forecastle and to eat some of the bread that was put there for them. The pigeons left the ship on 2 June—a day earlier than the swallows—and also flew off in a westerly direction. It would be appreciated if some information concerning the likes and dislikes of birds could be sent to the ship—some form of bird-gourmet menu!

Position of ship at 1200 GMT on 31 May: 46° 48'N, 9° 06'W.

Position of ship at 1200 GMT on 3 June: 28° 24'N, 15° 12'W.

*Note.* An article entitled 'Racing Pigeons' by Major L. Lewis, M.B.E. published in the April 1975 edition of *The Marine Observer* includes the normal diet of racing pigeons and also suggests food that might be offered to fatigued pigeons which alight on ships to rest.

Another article, 'Birds Aboard' by Major the Hon. H. Douglas-Home published in the July 1975 edition of *The Marine Observer* describes the food best suited to feathered visitors aboard ships.

Further, a *Note* by Lt N. R. Messenger, R.N.R. of the Royal Naval Birdwatching Society appended to an observation recorded in the January 1971 edition of *The Marine Observer*, states: 'A bird landing on board finds itself in a completely alien world of noise and people. It becomes frightened and, being already exhausted, is very difficult to feed. By experience I have found a glucose-and-water solution to be the general answer. To administer this I use a plastic disposable syringe and a large blunted hypodermic needle. The bird is wrapped in towelling and, while being firmly held by an assistant, it is comparatively easy to squirt the solution well back into the throat. After an initial dose the bird is placed in darkness, a suitably furnished tea-chest being ideal for this purpose, and left quiet and undisturbed for about 12 hours. After this rest period the bird is well on the way to recovery and from then on regular doses of the glucose-and-water solution are administered until the bird is ready for release.'

## CAPE PENGUINS

### Table Bay, Cape Town

m.v. *British Commodore.* Captain J. Pinkney. At anchor. Observers, Mr R. Bragg, Radio Officer, Mr R. P. Massingham, 2nd Officer, Boatswain and Carpenter.

24 April 1975. Whilst at anchor undergoing engine repairs in Table Bay a Cape Penguin was observed swimming around the vessel showing a great deal of interest in all that was going on. Anxious to oblige we decided to attempt to bring it aboard and for this purpose a wire basket and a length of rope were made ready. At first the Radio Officer attempted to catch the penguin from the main deck but without success. He then decided to make an attempt from the bottom of the accommodation ladder which was about two metres from the water.

From the penguin's behaviour, which consisted of swimming past but returning when whistled at, we assumed it had had a fair amount of previous contact with people and after two attempts it swam voluntarily into the basket and was hauled aboard. The penguin made no attempt to escape and, once on the main deck, it wandered around showing great interest in everything and providing us with a great deal of entertainment. Whilst aboard, attempts were made to feed it, but it appeared to prefer the Carpenter's fingers to the fish we offered.

After about an hour aboard the penguin was returned to the water by means of the basket and it then continued to swim around until joined by four other penguins and swam off with them.

Position of ship: 33° 35′S, 18° 25′E.

## PENGUINS AND SEALS

### South African waters

s.s. *Benlomond.* Captain A. Yuill. Durban to Dakar. Observers, Mr N. C. Reid, 2nd Officer and Mr M. Keeble, 2nd Radio Officer.

15 April 1975. At 1600 GMT, when sailing westbound between Cape Agulhas and Cape of Good Hope, a large flock of penguins was observed on the port side of the ship approximately 3 to 4 n. mile away. They could not be identified at that distance, but were presumed to be Cape Penguins. It was difficult to count the birds as they dived and jumped in their peculiar swimming style, but it was estimated that there were 100–120 birds in the flock. They appeared to be heading almost due east. At the same time several groups of seals were seen lying on their backs on the surface of the swell apparently enjoying the sunshine.

Position of ship: 34° 39′S, 18° 46′E.

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

'The Cape Penguins reported by the *Benlomond* belong to the species Jackass Penguin (*Spheniscus demersus*) local to the South African coast and often seen off the Cape.

'The seals apparently basking upside-down (belly up) on the surface of the sea seems a curious position to me—they certainly roll onto their sides and backs on shore. It would be interesting to know whether this behaviour has been witnessed by any other observers at sea.'

# INSECTS

## Southern North Atlantic

m.v. *Sugar Producer*. Captain G. Pirie, Georgetown, Guyana to Point Lisas, Trinidad. Observers, Mr A. Smith, 2nd Officer and Mr R. E. Shore, 3rd Officer.

29 May 1975. While the vessel was at sea during the 24-hour passage, a beetle was seen on the starboard bridge wing and although it was quite active, it was eventually captured. No one was sure what type of beetle it was but it was considered most probable that it came aboard at Georgetown as on-shore winds prevailed throughout the passage.

The insect seemed quite content living on the locker-tops in the wheelhouse but, for some unknown reason, it died several hours after capture. Air temp. 27·3°C, wet bulb 24·5. Wind ENE, force 4.

Position of ship: 9° 54′N, 59° 48′W.

*Note* 1. Mr P. M. Hammond, Department of Entomology, British Museum (Natural History), comments:

'Thank you for forwarding the beetle taken at sea near Trinidad by the *Sugar Producer*. I have examined the specimen and am able to identify it as *Megadytes giganteus Cast*. This is one of the largest species of water beetle of the family Dytiscidae. Members of this family are all of aquatic habits and are predators. Large species, such as *M. giganteus*, are fairly voracious and will eat almost any aquatic insects of suitable size or small fish. *M. giganteus* is widespread in the West Indies, Central and South America. The specimen could well have flown aboard in Georgetown but, as large Dytiscidae are very strong fliers, it is possible that the specimen may have flown some distance before landing on the vessel.'

*Note* 2. On being questioned further with reference to the size of these beetles, Mr Hammond estimated their length as 38 mm and added that they were similar in appearance to, but larger than, the common 'Great Diving Water Beetle'.

## Moçambique Channel

s.s. *Esso Ulidia*. Captain R. Steele. Lisbon to Bahrain. Observers, Mr E. C. Davies, 3rd Officer and Mr E. Metcalfe, A.B.

15 May 1975. During the afternoon whilst passing the Comoro Islands large numbers of winged insects descended upon the vessel. Many of them were observed

to pair off and appeared to be 'ardently engaged' for a while. Later in the day many of them littered the decks dying or dead. Specimens were obtained, although probably they are of a very common species it is hoped they will be of some interest. Wind during the period, SE'ly, force 4.

Position of ship at 1200 GMT: 11° 30'S, 42° 54'E.

*Note.* Mr Peter Ward, Department of Entomology, British Museum (Natural History), comments:

'The specimens from the *Esso Ulidia* examined by me were all dragonflies or Odonata. All three were of comparatively common species as follows:

(a) *Hemianax ephippiger*, Burm.
(b) *Anax tristis*, Hagen.
(c) *Trapezostigma basilaris* P. de B. (see sketch).

'All of these species have been taken on board ship in the past and are known to have some migratory tendencies. Even where these may only be local, the insects are sometimes carried out to sea by strong off-shore winds.'

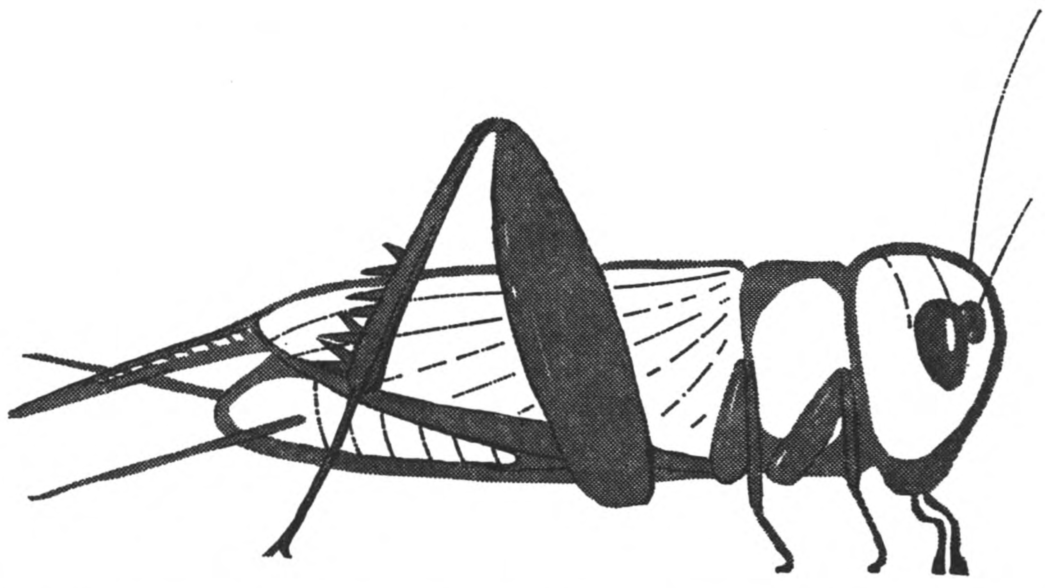
## CRICKETS

### South Indian Ocean

s.s. *Flinders Bay*. Captain R. A. Wilson. Fremantle to Fos sur Mer. Observers, the Master and all officers.

4–18 April 1975. The sound of crickets was first noticed on board on departure from Fremantle and was heard every night whilst the vessel crossed the South Indian Ocean. Shortly before passing Cape Town two were captured and studied whilst imprisoned in a glass jar, during which period they were fed on a sugar-and-water mixture. The crickets were 3–3½ cm long and had a glossy lacquered shell-like body which was dark-brown in colour although the head was of a darker hue, being almost black. During their captivity Mr P. Cave, 3rd Officer, made the accompanying sketch.

After approximately 15 days on board and about 4 days after passing Cape Town nothing more was heard of the crickets.



*Note.* Mr P. Ward of the Department of Entomology, British Museum (Natural History), comments:

'The crickets on the *Flinders Bay* were possibly *Teleogryllus commodus*, a common Australian cricket, although the sketch could also be of *Gryllus bimaculatus*, an equally common African species.'

## Persian Gulf

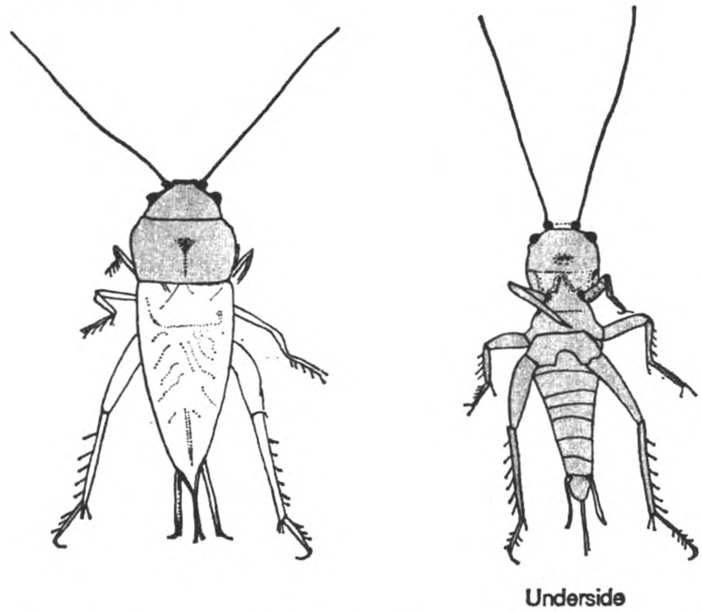
s.s. *Titan*. Captain J. A. Iliff. At anchor off Ras al Khaimah. Observer, Mr C. E. Gulley, Radio Officer.

11 June 1975. Sometime during the day the insect shown in the accompanying sketch joined the vessel. At night it maintained a continuous cricket-like chirping which was capable of keeping the observer awake through two closed doors and in spite of the noise of air conditioning. The creature was apparently extremely sensitive to noise and/or vibration, because it took three nights to discover its location. Even on final approach, in complete silence and creeping without shoes along a steel deck the stalker was detected at a distance of 7 metres. When captured, the insect was killed by immersing in alcohol which, it was hoped, would also preserve it for dispatch to the experts.

Details of the specimen were as follows:

Length from head to tip of tail 35 mm, antennae length 40 mm, hind leg length 30 mm. Colour of head and thorax very dark-brown or black gloss. Antennae, black at base, dark-brown at tips. Legs, translucent dark tan shading to black in places, double claw hooks at ends of legs. Tail section, neutral-khaki colour with greenish highlights, apparently wings, though creature was not observed in flight. Underside, all black with 7 rings on tail section. There were two outer 'horns' on underside of tail apparently vestigial legs.

Position of ship: 26° 00′N, 55° 50′E.




*Note*. Dr David R. Ragge, Department of Entomology, British Museum (Natural History), comments:

'The specimen found on the *Titan*, and so ably drawn by the Radio Officer, belonged to the species *Gryllus bimaculatus*, a common African and southern Asian cricket.'

# BIOLUMINESCENCE

## Arabian Sea

m.v. *British Cormorant*. Captain J. Hill. Lourenço Marques to Bandar Ma'shur, Iran. Observer, Mr N. H. Lane, extra 3rd Officer.

4 June 1975 between 1700 and 1740 GMT. After sunset the intensity of bioluminescence at the bow wave increased, and, as darkness closed in, it became a brilliant green. A wave breaking also showed this brilliant green glow. Every so often patches of pale green could be seen which appeared to be rising from the

depths, breaking surface and exploding into brilliant green. These patches were about 6–9 metres long and 1½–3 metres wide lying approximately north and south. On approaching one such patch and observing it through binoculars, it appeared that on reaching the surface thousands of small objects leapt out of the sea to a height of almost 15 cm. The only way to describe the effect was that of the movement of shrimps after they have been landed, when they jump around with rapid and irregular movements. As the vessel did not pass through any of these particular patches, no samples could be taken. However, a small sample obtained by means of the sea-bucket revealed no irregularities.

At 1740 the glow at the bow wave suddenly ceased as if it had been switched off. The following readings were taken during the occurrence: Air temp. 26·8°C, wet bulb 26·2, sea 26·5. Wind SW, force 5 decreasing to force 3.

It may be of interest that at 1630 hours it was noted that the ship had entered a cold current as the sea temperature had dropped from 29·5°C (read at 1200 hours) to 26·5. By 1800 the sea temperature had risen to 27·7.

Mean position of the ship: 17° 51′N, 57° 51′E.

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

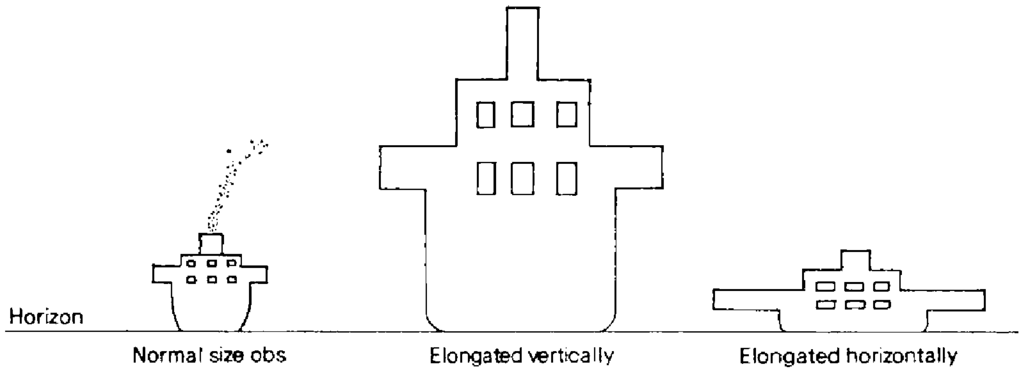
'The brilliant bow wave reported by the *British Cormorant* suggests the vessel was in an area of high dinoflagellate concentrations. The appearance of large patches of light rising to the surface is a very interesting observation, and was almost certainly caused by a swarm of animals coming up to the surface and disturbing the luminous organisms (dinoflagellates) on their way through them. The animals were probably either small crustaceans, possibly small shrimps as the observer suggests, or small fish. Few other animals are capable of jumping out of the water in the manner described. It is probably significant that the observations were made just after sunset, for it is at this time that many kinds of animals migrate up to feed in the surface waters. The swarms of animals may have been chased up to the surface by a larger fish, which might account for their behaviour in leaping out of the water.'

## ABNORMAL REFRACTION

### South African waters

m.v. *Glenogle*. Captain P. J. Broomfield. Rotterdam to Durban. Observers, the Master, Mr D. S. Walker, Chief Officer, Mr W. R. C. Butler and Mr J. Othman, 2nd Officers.

15 May 1975. During the afternoon watch, whilst the vessel was rounding the Cape of Good Hope, a phenomenon involving superior and inferior refraction was observed. Ships on the horizon were seen to be elongated at one instant and were compressed in the next. The horizontal visibility at the time of observation was about 13 to 14 n. mile. At this distance, ships appeared to be like small boats yet the echoes displayed on the radar were those of large vessels. As the distance between the *Glenogle* and the observed ships decreased, the observed vessels regained their normal size.



Later on, ships on the horizon were observed to look like tall buildings, being elongated vertically. A few minutes later they appeared to be compressed vertically and looked like large flat objects floating on the sea. This phenomenon was observed throughout the afternoon and disappeared about an hour before sunset.

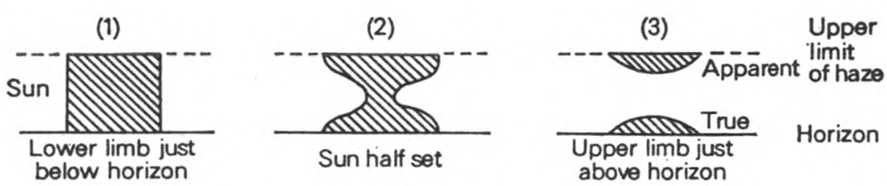
Pressure 1021·7 mb. Air temp. 19·8°C, wet bulb 15·7. Wind light and variable. Course 114°T at 19 kn.

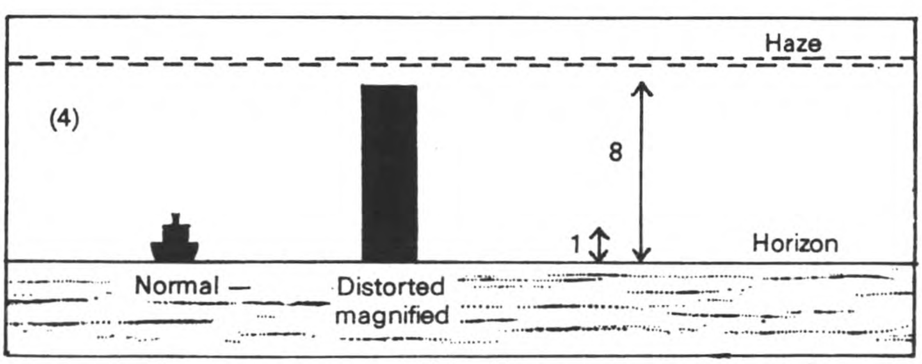
Position of ship at 1200 GMT: 34° 30′S, 18° 30′E.

## Gulf of Guinea

s.s. *Opalia*. Commodore R. Lumsden. Dakar to Forcados, Nigeria. Observers, the Master and Mr P. A. S. Markland, 3rd Officer.

18 June 1975. From approximately 1900 GMT to twilight at 2048 a thin layer of haze was apparent on the horizon which was calculated to have a vertical height of some 200 metres. At 2001 the sun set and as it sank through the haze it began to




change shape (see diagrams 1–3). During this period several vessels which had overtaken the *Opalia* heading on a similar course happened to be on the horizon, a distance of 10 n. mile, and these vessels were also subject to distortion. Their accommodation appeared to be about 8 times greater in height than actual (see diagram 4). Weather details at time of phenomenon were as follows: Wind light and variable, force 1, sea smooth with low short swell. Visibility 17 n. mile. Sky clear. The ship was on a course of 236°T.

Position of ship at 1800 GMT: 4° 00′N, 6° 24′W.

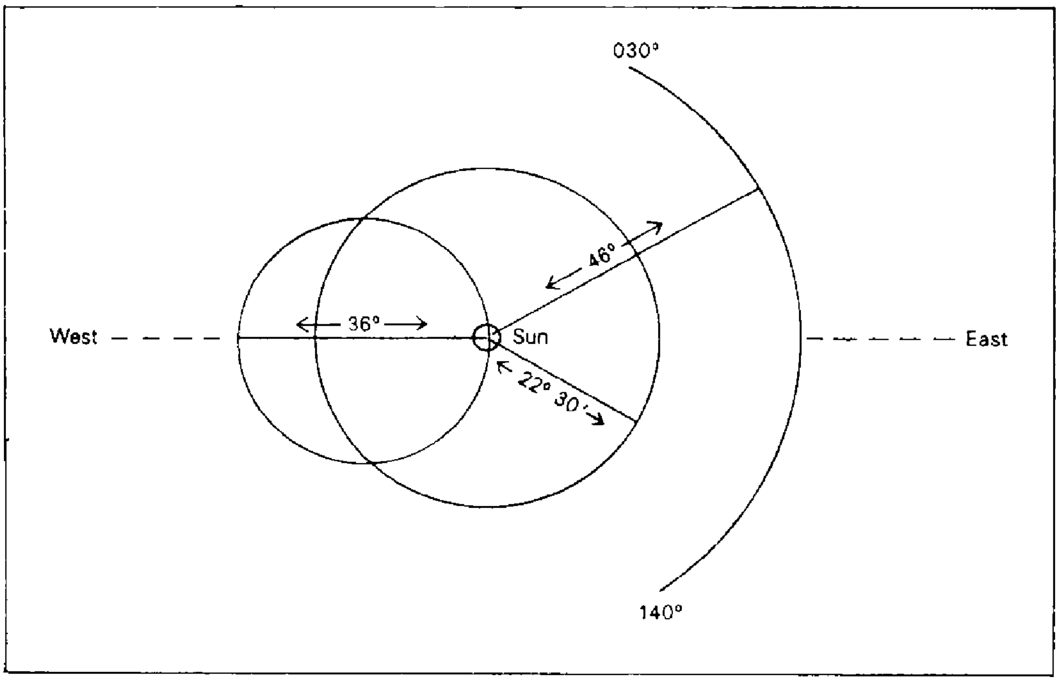
# SOLAR HALOES

## Caribbean Sea

m.v. *Vancouver City*. Captain T. W. D. John. Panama to Houston. Observers, the Master and Mr P. C. Roberts, 3rd Officer.

14 May 1975. At 1600 GMT the solar haloes depicted in the accompanying diagram were observed. The cloud cover at the time was 2 oktas cumulus with the rest of the sky covered by a thin veil of cirrostratus and the sun's altitude was 72° rising. The 22½° halo and 46° arc clearly showed a spectrum, from light blue to medium red, but the 36° halo was much fainter. By 1630 the 36° halo and 46° arc had disappeared, and by 1830 the 22½° halo had also disappeared.

Position of ship: 19° 28′N, 84° 26′W.




## GREEN FLASH FROM VENUS

### South Indian Ocean

s.s. *Argyllshire*. Captain T. R. Halliday. Mauritius to Durban. Observers, Mr T. W. Edmunds, 3rd Officer.

23 June 1975. At 1756 GMT the planet Venus was observed to set in exceptionally clear atmospheric conditions. When the planet was slightly above the horizon it appeared red but on examination through binoculars it was in fact alternating from red to orange and back again. At the moment the planet set the colour immediately changed to bright green and a small bright green flash was observed, lasting about 1 second.

The sky at the time of the observation was almost cloudless with only a trace of cumulus to the westward. The brightness of the full moon created almost daylight conditions on the bridge.

Pressure 1023·3 mb. Air temp. 22·9°C, wet bulb 19·5.

Position of ship: 27° 06′S, 40° 54′E.

*Note.* The green flash has been fairly frequently seen at the setting of the bright planets Venus and Jupiter, and an observation of a blue flash from Venus is on record. Many interesting varieties of phenomena may occur before these planets set, the observation usually requiring binoculars. Colour changes may be seen, usually between white, red and green, or two images may appear of the same or different colours. The planet may exhibit slow shimmering movements, obviously due to abnormal refraction.

## SATELLITE

### Gulf of Aden

m.v. *Lumen*. Jeddah to Ras Tanurah. Observer, Mr A. Frost, 2nd Officer.

30 April 1975. At 2208 GMT a bright object, presumed to be a re-entering satellite, but possibly a very bright meteor, was observed to be travelling from a point close by Spica towards Vega. The object was at least twice as bright as the moon, which was a little over half-full in a clear sky at the time of observation.

The object appeared to split up into six or seven separate pieces and burn up, all within a fraction of a second, when abreast of Alphecca.

The total duration of visible flight was about 3·5 seconds. The object was so bright that it was first thought to be a flare, but no other ships were within 12 miles at the time of observation and the phenomenon was not repeated, despite a keen watch being kept.

Total cloud cover was 3 oktas cumulus, but the area of sky overhead was completely clear.

Position of ship: 12° 50′N, 45° 44′E.

*Note* 1. The Science Research Council comments:

'Mr Frost observed the rocket body of COSMOS 728 which decayed in the earth's atmosphere on 30 April 1975.'

*Note* 2. The *Lumen* is not a Selected Ship. However, Mr Frost has previously served in the Voluntary Observing Fleet.

## AURORA

Recording of observations of visual aurora at the Balfour Stewart Auroral Laboratory of the University of Edinburgh ceased on 31 December 1975, and we publish in the accompanying list all the reports received from British ships to date since our previous list. The period of 22 years, covering a double solar cycle, was that planned by the late Mr James Paton, when he organized in the early fifties the network of observers, professional and amateur, in the United Kingdom and the Republic of Ireland, and in British ships and aircraft. The data centre in Edinburgh, originally one of the three World Centres, has, since 1957, collected observations from all western European countries as well as all-sky camera and other photographic data. These were interchanged with the centres in the U.S.A. and U.S.S.R.

The Centre has been maintained by a grant from the Royal Society; this support ends early in 1976, leaving, after the end of December, some time for the 'tidying-up' process. Nationally organized visual observations of aurora ceased in the U.S. some years ago; in the U.S.S.R. they are still carried on. Here in the U.K. the Aurora Section of the British Astronomical Association (under the directorship of B. McInnes at the Royal Observatory, Edinburgh) will be dealing with future observations of the phenomenon. All the data to 31 December 1975 are, however, to be housed in this Department of Edinburgh University, and will be readily available to researchers making personal visits or written enquiries.

We are grateful to have been allowed to publish our notes in *The Marine Observer*. We hope we may over the years have been able to convey in them a little of the importance that your observations have been to the Survey, and of the pleasure we have had in reading your descriptions and using your sketches. There is currently an upsurge of interest in solar–terrestial relationships; associations are being suggested between solar variability and such diverse events as the frequency of earthquakes in China, the formation of tree-rings in California and the ups and downs of business relations. We trust that such speculations will not cause you to wonder whether our past efforts to persuade some of you that there is no direct link between the solar wind and individual weather storms have in fact been well directed!

So, thank you, all the Weather Ships, the *Summitys*, the *Ross Orions*, the *Mirandas*, the *Manchester Crusaders* and all. We wish you safe journeys and happy landings.

MRS MARY HALLISSEY

| Date (1975) | Ship | Geographical Position | $\Lambda$ | $\Phi$ degrees | I | Time (GMT) | Forms |
|---|---|---|---|---|---|---|---|
| 3rd Apr. | *Weather Monitor* | 54°03′N 13°20′W | 070 | 59 | +69 | 2250–0030 | N |
| 6th | *Weather Monitor* | 53°07′N 15°30′W | 070 | 59 | +69 | 2115–2215 | N |
| 7th | *Weather Monitor* | 52°44′N 19°55′W | 060 | 59 | +69 | 2220–2355 | RR, N |
| 10th | *Weather Monitor* | 52°22′N 20°31′W | 060 | 59 | +69 | 2245–0015 | N |
| 12th | *Weather Monitor* | 52°40′N 19°40′W | 060 | 59 | +69 | 0330–0500 | N |
| 13th | *Weather Surveyor* | 59°00′N 19°25′W | 070 | 65 | +72 | 2215–2345 | HA, RA |
| 15th | *Weather Surveyor* | 59°09′N 19°38′W | 070 | 65 | +72 | 0130–0400 | N |
| 2nd May | *Botany Bay* | 44°30′S 115°00′E | 180 | −55 | −75 | 1230–1600 | HA, RA, RR |
| 1st June | *Victore* | 46°35′N 56°30′W | 020 | 58 | +73 | 0330–0350 | N |
| 6th Aug. | *Weather Reporter* | 57°10′N 19°56′W | 070 | 63 | +72 | 2340–0030 | N |
| 8th | *Weather Reporter* | 57°10′N 19°56′W | 070 | 63 | +72 | 0045 | N |
| | | 56°53′N 20°21′W | 070 | 63 | +72 | 2345–0100 | N |
| 10th | *Weather Reporter* | 57°05′N 20°06′W | 070 | 63 | +72 | 0045 | N |
| 11th | *Weather Reporter* | 56°53′N 19°57′W | 070 | 63 | +72 | 2345–0100 | N |
| 6th Sept. | *Weather Surveyor* | 56°58′N 20°29′W | 070 | 63 | +72 | 0145–0230 | N |
| 10th | *Weather Surveyor* | 56°59′N 20°08′W | 070 | 63 | +72 | 0030–0500 | HB, N |
| | | 56°57′N 20°01′W | 070 | 63 | +72 | 2340–0300 | HA, N |
| 12th | *Weather Surveyor* | 56°55′N 20°34′W | 070 | 63 | +72 | 0145–0520 | HB, RA, RR, N |
| | | 57°00′N 20°06′W | 070 | 63 | +72 | 2150–0247 | N |
| 14th | *Weather Surveyor* | 56°41′N 18°52′W | 070 | 63 | +72 | 0155–0425 | N |
| 15th | *C.P. Trader* | 50°09′N 59°20′W | 010 | 61 | +75 | 0745–0810 | RA, RB |
| 27th | *Weather Reporter* | 57°04′N 19°50′W | 070 | 63 | +72 | 0001 | RA, RR |
| 7th Oct. | RRS *Discovery* | 53°37′N 30°00′W | 050 | 62 | +71 | 2050–2120 | N |
| 8th | *Cape Nelson* | 51°10′N 29°30′W | 050 | 60 | +70 | 2155 | HA |
| | RRS *Discovery* | 53°41′N 27°27′W | 060 | 61 | +70 | 2340–0010 | RA, RR |
| 11th | *Gothland* | 57°36′N 35°36′W | 050 | 66 | +74 | 2245–2305 | HA, RA, RR |
| 28th | *Weather Surveyor* | 57°03′N 20°13′W | 070 | 63 | +72 | 2000–0200 | HA, HB, RR, N |
| 2nd Nov. | *Miranda* | 61°28′N 07°03′W | 080 | 65 | +74 | 2330–0430 | HB, RB, N |
| 4th | *Weather Reporter* | 56°58′N 20°19′W | 070 | 63 | +72 | 0345–0600 | N |
| 5th | *Weather Reporter* | 56°46′N 20°11′W | 070 | 63 | +72 | 0550–0700 | N |
| 22nd | *Weather Reporter* | 56°51′N 20°26′W | 070 | 63 | +72 | 1850 | N |
| | | | | | | 2145–2240 | N |
| 23rd | *Weather Reporter* | 56°50′N 20°00′W | 070 | 63 | +72 | 0042 | N |
| 29th | *Weather Surveyor* | 57°03′N 19°57′W | 070 | 63 | +72 | 2020–0600 | HB, RR, N |
| 1st Dec. | *Weather Surveyor* | 57°06′N 19°58′W | 070 | 63 | +72 | 2245–0300 | N |
| 8th | *Weather Surveyor* | 57°02′N 20°24′W | 070 | 63 | +72 | 2205–0400 | N |
| 22nd | *Weather Reporter* | 57°02′N 19°35′W | 070 | 63 | +72 | 2145–2150 | N |
| 26th | *Weather Reporter* | 57°17′N 20°00′W | 070 | 63 | +72 | 0340–0350 | N |
| 28th | *Weather Reporter* | 57°12′N 19°57′W | 070 | 63 | +72 | 0545–0555 | N |
| | | | | | | 0748–0754 | |
| 30th | *Weather Reporter* | 56°48′N 20°04′W | 070 | 63 | +72 | 0145 | |
| | | | | | | 0640–0650 | N |

KEY: $\Lambda$ = geomagnetic longitude; $\Phi$ = geomagnetic latitude; I = inclination; HA = homogeneous arc; HB = homogeneous band; RA = rayed arc; RB = rayed band; R(R) = ray(s); N = unidentified auroral form.

# Offshore Mining of Manganese Nodules

By A. G. Moncrieff

(This article is reproduced from *Lloyd's List*, 30 July 1975, by kind permission of the Editor.)

On 21 December 1872, H.M.S. *Challenger* sailed from Portsmouth under the command of Captain Nares on what was to prove to be one of the most important scientific expeditions ever undertaken. The objects of the voyage, which lasted three and a half years, were to determine the physical and biological conditions of the great ocean basins. On the outward voyage she crossed the Atlantic four times, then sailed from the Cape of Good Hope, dipping within the Antarctic Circle, to Australia and New Zealand. From there she went through the Malay Archipelago to Hong Kong and Japan, across the Pacific, round Cape Horn and home across the Atlantic. Many observations of depth and water temperature were taken, numerous samples of water were analysed, many biological specimens obtained, and observations on the many people met at their various ports of call were recorded.

H.M.S. *Challenger* also dredged many samples from the sea floor, and it was amongst these that manganese nodules were found. The first time they found them was quite early in the voyage, in the Atlantic, but at the time they did not realize they contained manganese and thought they were phosphatic concretions. However, a few days later they dredged some more describing them as 'very peculiar black oval bodies about an inch long' and found on analysis that they consisted of 'almost pure peroxide of manganese'.

Many further samples of these nodules were obtained on the *Challenger* voyage, and when they reached the Pacific (between Yokohama and Honolulu) they dredged them in large quantities. According to the official record 'the largest nodules were about the size of cricket balls; they were more or less rounded or ellipsoidal, and when rolled on the deck they looked like a pile of dirty potatoes'. The crew had other descriptions of them, and of the mess made on the deck by all the mud brought up!

The *Challenger* was a three-masted, square-rigged, wooden ship of 2300 tons displacement and 1260 horse power—officially described as a steam corvette. Her length, beam and draft were 61 metres, 12 metres and 4·6 metres. Besides her crew of 244, there were six scientists on board, appointed by the Royal Society of London, and under the direction of Wyville Thomson—Professor of Natural History at Edinburgh University.

For collecting sea-bed samples they used a dredge towed by bolt-rope (of which they had 45 750 metres on board) powered by an 18-horse-power donkey-engine.

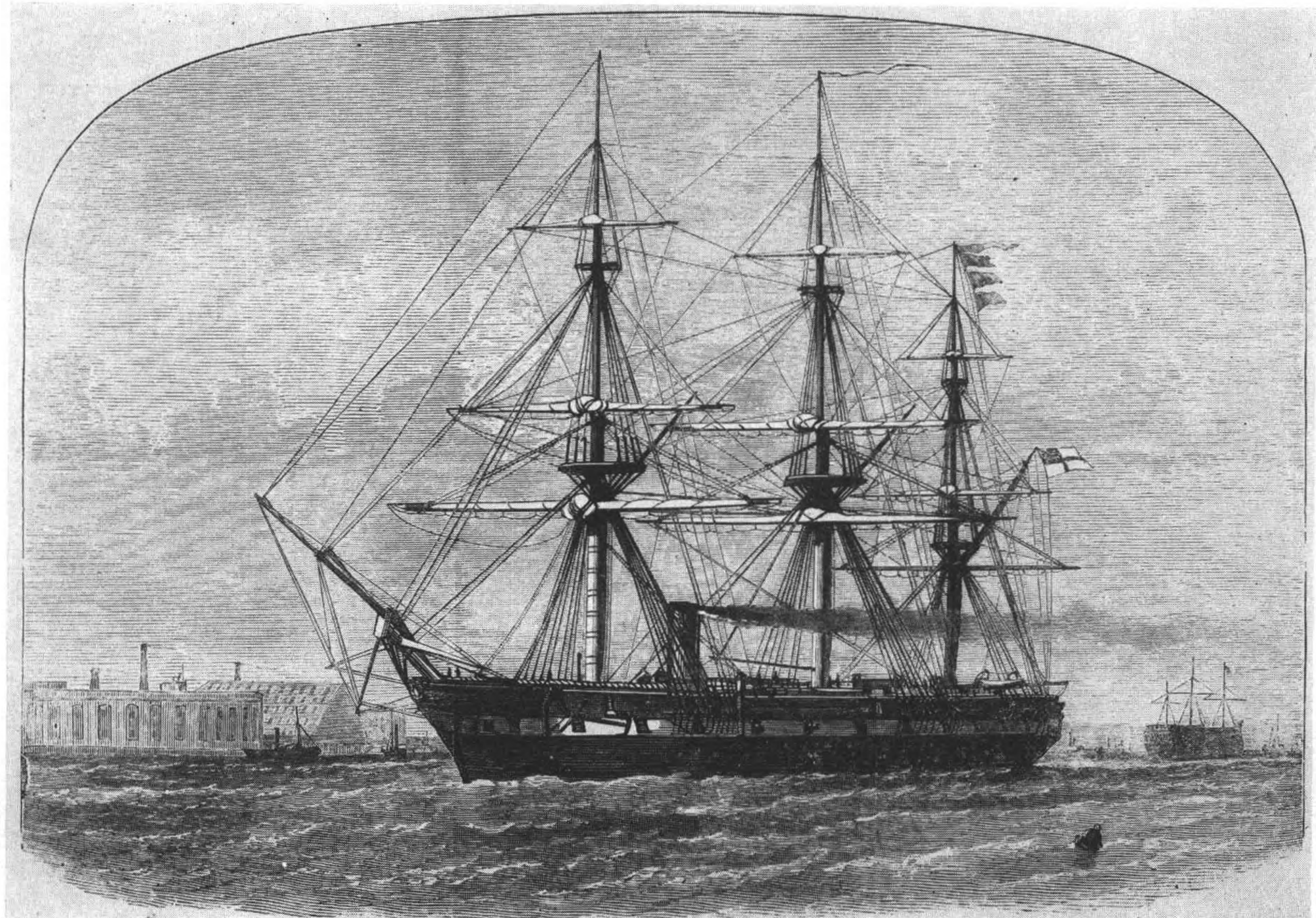
One hundred years ago nodules were only a scientific curiosity and, although they were analysed in great detail and some were found to contain nickel and copper, there was no thought then that they might one day be an ore from which these metals could be recovered commercially.

In fact, it was not until the 1950s that anyone began to consider nodules as a possible commercial ore, and it is only in the last ten years or so that the problems of mining them in large quantities, and of extracting the metals from them, have been seriously investigated.

## Nodule deposits

Although nodules have been found in all the oceans of the world (except the Arctic), both on the continental shelf and in the deep ocean, it is those on the abyssal plains of the Pacific, at depths of about 5000 metres, that have attracted the most attention from a commercial viewpoint. Not only do they occur there in greater abundance, but the topography of the sea floor is fairly flat—thus presenting a less

(Opposite page 72)



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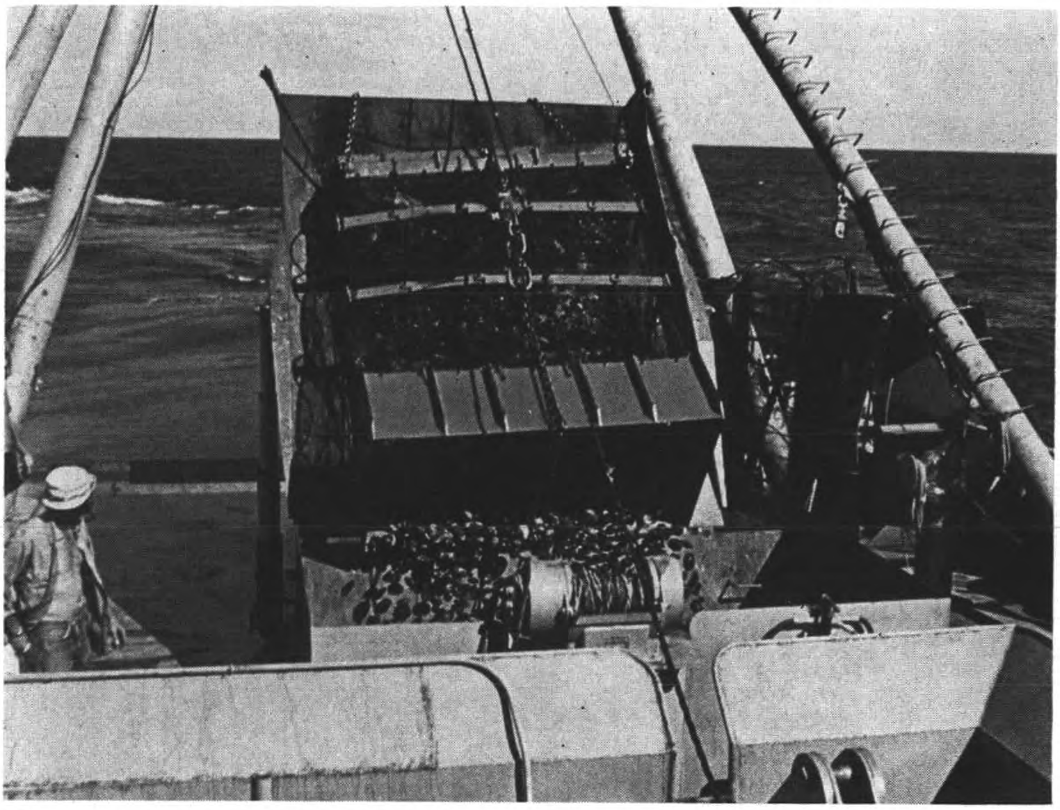
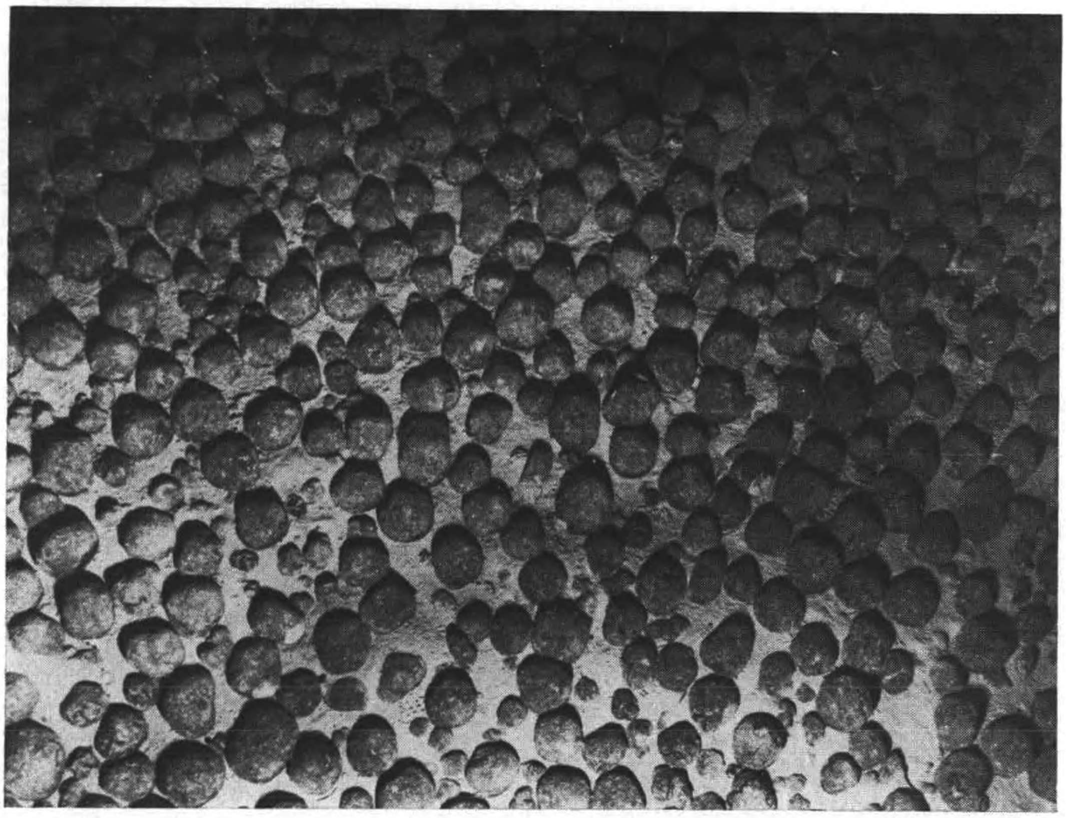
H.M.S. *Challenger*. Manganese nodules were first discovered on the *Challenger* expedition of 1872 to 1876 (*see* page 72).

(*Opposite page 73*)



Manganese nodules dredged from the Pacific Ocean being emptied into the recovery ship. The nodules are a potential source of metals, such as copper and nickel.



Manganese nodules resembling lumps of coal, photographed *in situ* thousands of metres below the surface of the Pacific Ocean. The abundance of nodules shown in this photograph is considerably higher than normally found.

severe problem for mining. Also, in one part of the Pacific, there is an area of 2 or 3 million square miles, from just south of Hawaii to west of southern California, within which there are areas containing a high abundance of nodules with nickel and copper contents that are higher than most others that have been found.

Typically, nodules contain between 15 and 30 per cent manganese, and 5 to 15 per cent iron. It is abnormal to find much more than 1·5 per cent nickel, or 1·3 per cent copper or 0·7 per cent cobalt, and many nodules only show a trace of these metals. There appears to be a positive correlation between the manganese, nickel and copper content, but in general the cobalt content varies inversely with these metals. Commercial sites in the central Pacific are expected to average about 1·3 per cent nickel, 1·1 per cent copper and 0·25 per cent cobalt.

Horn, Delach and Horn, at Columbia University, have collected assays of many samples and determined the averages for various parts of the oceans, as shown in the table.

Most nodules are found on the ocean floor itself, or buried only a few centimetres in the mud. They are very porous, and as mined they contain about 30 per cent moisture even after draining off the superficial water. In the technical literature their abundance on the sea floor is normally expressed as the wet weight per unit area, but for simplicity I will use dry weights. Locally the abundance may be as high as 70 kilograms per square metre, but over all the potential mining sites within the prime area of the Pacific already referred to, the average abundance would probably be only about one-tenth of this. However, the first operations may find suitable areas with an average abundance of around 10 kilograms per square metre.

## Mining methods

Before mining methods can be considered, a vast amount of work is required to determine the topography and physical properties of the sea floor. Although I have mentioned that much of the floor of the Pacific is fairly flat, this is obviously only a relative description. It would be more accurate to describe it as gentle hills and dales with low relief but even within such areas there are escarpments and outcrops of basalt. On the abyssal plains most of the sea floor is covered with a very fine sediment, largely of organic origin, which has been deposited at a very slow rate. Of course, in areas closer to land there is material of terrestrial and sometimes volcanic origin.

Two basic methods of mining are being considered. The first is a continuous line-bucket dredge frequently referred to as the C.L.B. system. This uses a number of large buckets attached to an endless polypropylene rope. The buckets are hauled over the ocean floor, hoisted to the surface where they discharge their load into a ship, and are then returned to the ocean floor. It appears that in the first test, which used a single ship, there were major problems with the rope becoming tangled; it is understood that a second test, using two ships to keep the rising and falling sections of the rope separated, is to be conducted this year.

The second method uses a hydraulic system. This would require some collecting device towed over the ocean floor, delivering the nodules into a pipeline through which they would be lifted by some form of pump—one group has been testing an airlift for this purpose.

The lowest rate of mining which anyone appears to be considering is 1 million tonnes per year of dry nodules, but others are considering up to 4 million tonnes per year in the first instance.

It is estimated that about 60 to 65 per cent of the nodules traversed by a mining unit might be recovered into a treatment plant; on this basis, and allowing 250 operating days per year in an area with an abundance of 10 kilograms per square metre, a 3-million-tonne-per-year operation would have to sweep 20 to 25 square metres per second; from this, various combinations of towing speed and sweep path can be calculated.

Within most potential mining sites there are likely to be zones that are unminable for reasons such as difficult topography. Also no mining unit could sweep the whole site without re-sweeping areas that had been previously mined. Taking these two factors into consideration it is unlikely that on average more than one-third of a mine site could be swept without accepting a significant reduction in abundance because of re-sweeping previously mined areas. This would mean that a 3-million-tonne-per-year operation would require about 800 square miles per year.

At the present time there is insufficient information available to indicate what proportion of the prime area of the Pacific already referred to might provide suitable mine sites. However, a rough guess is that possibly a quarter of it might have grades and abundance similar to those assumed above. This would be sufficient for about 30 such operations each with a 25-year life. There might also be further sites with somewhat lower grade and abundance, and possibly less favourable topography.

## Processing

The composition of nodules is such that processing at sea, other than partial de-watering and removal of fine mud particles, is unlikely. Thus on reaching the surface they must be delivered to ore-carriers and transported to a land-based processing plant.

Little has been published on the methods of recovering metals from nodules, but the most likely approach is by a hydrometallurgical process. One consortium is proposing a hydrochlorination process to recover not only nickel, copper and cobalt, but also manganese in the metallic form. Others are proposing a selective leaching process to dissove the nickel, copper and cobalt, leaving the manganese in the residue. Having obtained the metals in solution, and separated this from the residual solids, methods similar to those used for land-based ores can be applied to recover them in a salable form.

Published information indicates that recovery of nickel and copper will be 90 to 95 per cent. Cobalt recovery will be more dependent on the process used, but should be at least 40 per cent, and possibly up to 80 per cent. Using the nodule analyses already given this would result in production of about 35 000 tonnes per year of nickel, 30 000 tonnes per year of copper and 3000 to 6000 tonnes per year of cobalt from an operation treating 3 million tonnes per year of nodules. International trade in manganese is mainly in the form of ore containing about 50 per cent manganese and, as current production and consumption of the pure metal is very low, it is more meaningful to express tonnages in terms of ore-equivalent. If manganese is recovered from a nodule operation of the above size, production would be about 1·5 million tonnes of ore-equivalent per year.

## Effect on metal markets and existing producers

Present world consumptions of the metals which might be produced from nodules are approximately as follows:

| | |
|---|---|
| Copper | 6 000 000 tonnes per year (excluding secondary copper) |
| Nickel | 500 000 tonnes per year |
| Cobalt | 25 000 tonnes per year |
| Manganese ore | 13 000 000 tonnes per year. |

Consumption of these metals has been increasing at rates varying between 4·5 and 6·2 per cent per annum, but this growth-rate may be slightly lower in future as illustrated in the graph.

The time when the first nodule operation will come into production and the rate at which further operations will come in, are still uncertain factors. However, it is unlikely that the first will start before 1980, or that on average more than one new one will start every two years between then and 1990. Accepting these possibly optimistic assumptions, and further, that after 1990, one new operation starts every year, the production that would still have to come from land-based operations is indicated on the graph.

Of course, such graphs entail making many assumptions regarding both consumption and production and they should only be taken as indicative. Some further comment is necessary on each of the four metals.

### Manganese

The projection shown assumes that only one in three nodule operations produces manganese. By the end of the period shown (2000) it is, of course, possible that not only will manganese be produced from some current operations, but it might also be produced from the residues of older operations. However, such residues will contain impurities, and be in a very finely divided form; they would certainly require further treatment before they could be a substitute for land-based manganese ore. Whether or not this happens is primarily a matter of economics and availability of high-grade ore from land-based sources.

### Copper

The effect of copper production from nodules is seen to be almost negligible, and far less than the accuracy with which further consumption can be predicted.

### Nickel

The projection indicates that, even with the nodule production assumed, new land-based sources of nickel will also be required. Such increases in land-based production will have to come almost entirely from lateritic deposits such as those in New Caledonia, Indonesia, the Philippines and parts of Australia. Although many such deposits are known, and they are already providing an increasing share of production, they are proving to be a high-cost source, and hardly economic at the current nickel price.

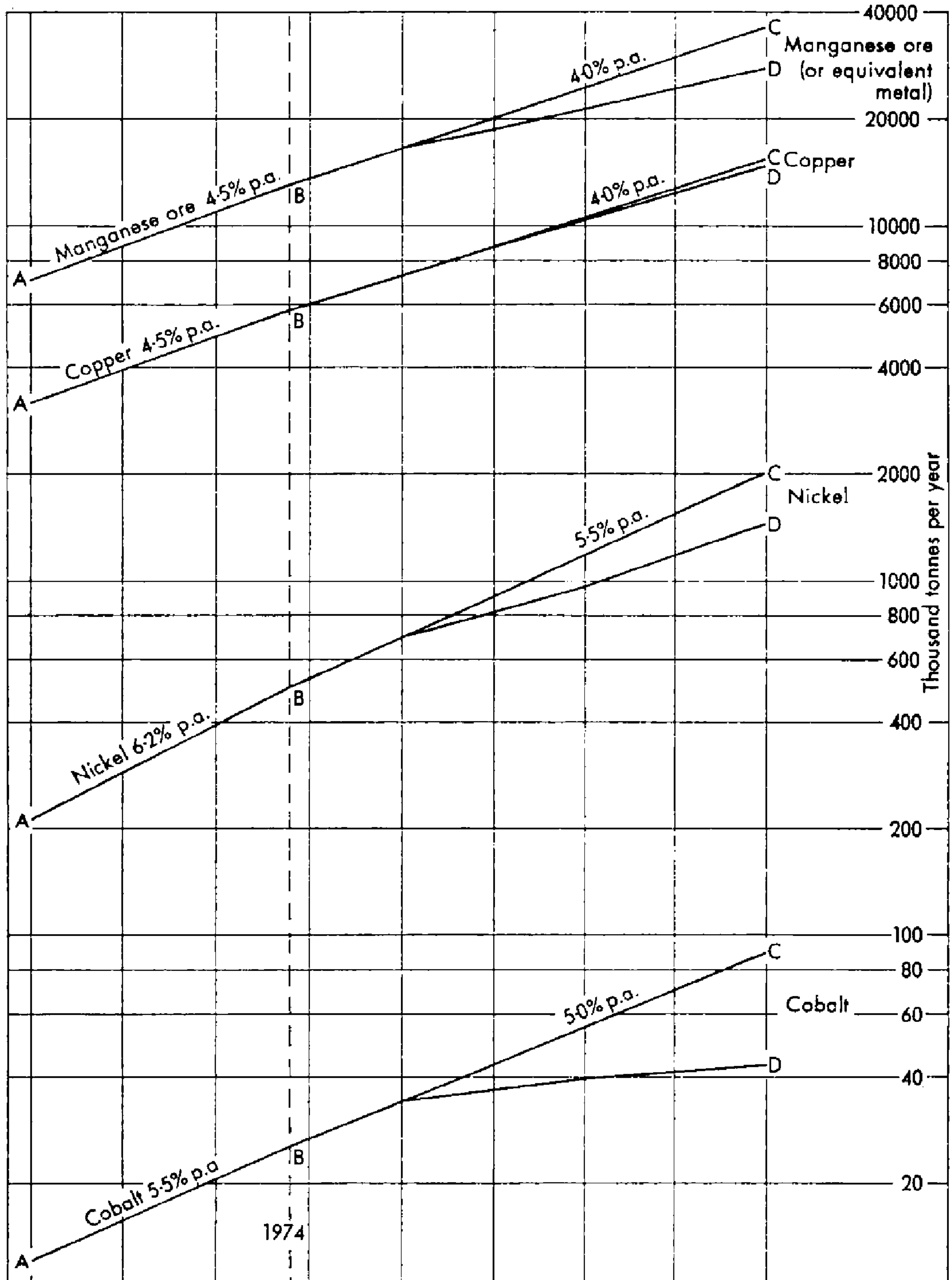
### Cobalt

The projection shown is based on only 3000 tonnes per year of cobalt from each operation whereas, as already stated, it might be up to twice this amount. This would appear to indicate that the requirement from land-based sources might fall drastically. However, there are two factors offsetting this. First, all cobalt is produced as a by-product and at present 70 per cent comes from the copper mines in Zaire. With more cobalt available from more diverse sources, consumption could increase more rapidly than shown.

Secondly, at a lower price (particularly relative to the nickel price), cobalt consumption could increase significantly. The worst effect that might be expected would be for the price of cobalt (now $4 per pound) to fall to that of nickel (now $2 per pound), since it could be substituted for nickel in some applications. This was clearly shown during the recent shortage of nickel, when its price increased to that of cobalt for a short period.

It should also be pointed out that if nodule production does not start, it is difficult to see where the projected demand for cobalt would come from. Zaire might be able to supply the extra production indicated up to about 1985, but this would mean about 85 per cent of world production then coming from that country, and dependence on that country increasing production to match any increase in demand.

## Demand for 'Nodule' Metals




AB Actual trend lines of 'Free World' demand 1960–74
BC Projected trend lines of total 'Free World' demand 1975–2000 at growth-rates shown
BD Projected demand for land-based production 1975–2000 assuming:

1. Total demand as shown by BC.
2. One new nodule operation every 2 years from 1980 to 1990 and one every year from 1990 to 2000.
3. Each nodule operation produces the following at full production (as represented by BC–BD)
   Cobalt 3000 t.p.a. Copper 30 000 t.p.a. Nickel 35 000 t.p.a.
   and one in three also produces Manganese ore (or metal equivalent) 1·5 million t.p.a.
4. In the year in which an operation starts, it is assumed that no production reaches the market and that in the next year production-equivalent to 50 per cent capacity reaches the market.

## Economics

With the present high rate of cost escalation, most published estimates of costs need to be updated and in any event all published estimates have only been based on indicative costs without detailed engineering. However, at mid-1975 prices, the order of magnitude of capital costs to bring a 3-million-tonne-per-year project (producing nickel, copper and cobalt only) into production would be approximately $600 million excluding further research and development and interest on pre-production expenditure. Annual operating costs would be about $150 million (excluding depreciation) or $50 per tonne of nodules. At present metal prices, gross sales revenue would be about $230 million, so giving an operating profit (before depreciation, interest and tax) of around $80 million.

This would hardly be considered an attractive investment. However, it is doubtful if many (if any) land-based copper or nickel mines would look any more attractive at today's metal prices. If new mines are to be opened up to meet the world's increasing demand of metals, copper and nickel prices will have to increase around 25 per cent above today's levels, plus whatever is required to cover further cost escalation before production starts. Under such conditions, nodule mining would begin to show a reasonable return on investment—provided taxation is not too harsh, and provided the R & D expenditure can be written off over more than one operation.

## Law of the Sea

At the end of the Geneva session of the Third United Nations Conference on Law of the Sea (UNCLOS), there was little indication that much progress had been achieved towards a convention which those who will provide the capital for nodule projects would find satisfactory. The 'Informal Single Negotiating Text' on a 'Convention on the Sea Bed and the Ocean Floor and the Sub-soil thereof beyond the limits of National Jurisdiction', which was tabled on the last day of the Geneva Conference, essentially presents the proposals of the developing world (though several developing countries will no doubt also find it unacceptable). If the industrial countries were to agree to a convention resembling this draft, no nodules would be mined. Not only would the detailed provision for direct control by an international authority be unacceptable to those risking their money in a project, but the whole philosophy of it would be based on the concept of a 'new economic order' designed to transfer wealth from the industrial to the developing countries. Moreover, the cost of the authority itself, with its own Assembly, Council, Economic Planning Commission, Technical Commission, Enterprise, Tribunal and Secretariat would be prohibitive and no commercial organization would consider its investment safe with the power given to an Assembly empowered to take all decisions on the basis of one country—one vote.

Where then do we go from here? First it is to be hoped that between now (1975) and the next session of UNCLOS in March 1976, common sense will prevail, and that every country will strive to produce an agreement that is both acceptable and workable. However, it must be admitted that the very procedures of negotiation at such U.N. conferences are not conducive to producing agreement on such a difficult and emotional subject. Perhaps some group of countries—both developed and developing—can get together in time and provide a nucleus for a more rational approach. The alternative appears to be no agreement, with the strong possibility of some countries taking unilateral action, though all countries would like to avoid this provided a reasonable alternative can be found.

The Convention on the sea bed beyond the limits of national jurisdiction is only one part of the Law of the Sea Conference. Amongst other matters it is concerned with definition of the limits of national jurisdiction and economic zones, the rights of states within such zones, fishing, passage through straits, pollution, transfer of technology and a host of other matters. Indications so far are that agreement will have to be reached on all these complex matters before a new Law of the Sea can be ratified. It should not be forgotten that, although all concerned would like to see the recovery of minerals from the deep oceans carried out under a regime acceptable to and recognized by all states, there is nothing in existing law to prevent anyone from carrying out such operations. However, some might consider such action to be contrary to the spirit of the declaration by the United Nations that minerals in the ocean beyond the limits of national jurisdiction are the 'common heritage of all mankind'.

AVERAGE GRADES OF MANGANESE NODULES

| | | per cent | | | |
|---|---|---|---|---|---|
| | | Mn | Ni | Cu | Co |
| NORTH ATLANTIC | BLAKE PLATEAU | 14·5 | 0·50 | 0·08 | 0·42 |
| | RED CLAY REGION EAST OF FLORIDA | 13·9 | 0·36 | 0·24 | 0·35 |
| | KELVIN SEA MOUNTS AND MID ATLANTIC RIDGE | 13·5 | 0·39 | 0·14 | 0·36 |
| SOUTH ATLANTIC AND INDIAN OCEAN | | 16·3 | 0·54 | 0·20 | 0·26 |
| NORTH PACIFIC | RED CLAY AREA | 18·2 | 0·76 | 0·49 | 0·25 |
| | SILICEOUS OOZE AREAS | 24·6 | 1·28 | 1·16 | 0·23 |
| | SEA MOUNTS IN HAWAII AREA | | | | 0·79 |
| SOUTH PACIFIC | DEEP WATER CLAY AREAS | 15·1 | 0·51 | 0·23 | 0·34 |
| | SUBMARINE HIGH AREAS | 14·6 | 0·41 | 0·13 | 0·78 |

Assays from: Horn, Delach and Horn.
Lamont–Doherty Geological Observatory of Columbia University, 1973. Technical Report No. 3, NSF GX 33616.

551.507.23 : 599.5

# Observations on Whales from Ships, 1952–66*

By N. A. Mackintosh, C.B.E., D.SC.
(National Institute of Oceanography)

In 1951 a plan was formulated, with the kind co-operation of the Meteorological Office, for inviting mariners to record observations on whales and other Cetacea. Its purpose was to assist in studies which are carried out in the National Institute of Oceanography, and it was initiated with an article in *The Marine Observer* (Mackintosh 1952). The response was good both at the start and in subsequent years. It was originally supposed that such observations could usefully be collected for several years, but that the scheme should be wound up sooner or later according to results. In fact it met with considerable success and has therefore been continued for fourteen years, and reports from hundreds of voyages, referring to some thousands of observations, have provided quite new information on the world distribution of Cetaceans. It was necessary to build up a large mass of data before firm conclusions could be drawn, but beyond a certain point it becomes more difficult to make new inferences from further accumulations of routine observations, so that the work involved brings diminishing returns. It is felt that we have now reached this stage, at least in respect of regular observations from the usual shipping routes. One of the purposes of this article therefore is to give notice of the termination of the scheme in its present form (though certain further observations would still be welcome) and to express our thanks to all those who have organized and made the observations.

First a little should be said of the uses to which the reports have been put. Forms for recording observations, and an explanatory booklet, were supplied by the National Institute of Oceanography and distributed by the Meteorological Office, largely with the kind assistance of Port Meteorological Officers, or sometimes directly from the Institute, to observers in a large number of ships. One or more forms covering each voyage are received at the Institute and normally give enough data for the ship's route to be plotted approximately on a chart, with the points at which Cetaceans were observed. To obtain any good evidence on their distribution it is necessary to estimate, however roughly, the relative numbers present (or the 'population density') in different ocean regions, and it was found most convenient to take as a criterion the number seen per thousand miles' steaming by ships crossing the area in question. It is generally difficult to distinguish one species from another with certainty, though sperm whales and humpbacks can often be identified. Therefore calculations were generally made separately for sperm, humpback, rorquals (i.e. fin, blue, sei, and minke whales which are much alike) and 'large whales' (i.e. those only specified as such). The distribution of small whales, dolphins, etc., has also been examined, but analysis of these groups has not yet been carried so far as for the larger species.

When reports are received they are carefully examined, usually by two members of the staff, so that any points of interest can be noted, and then filed until a large number can be analysed together. This has nearly all been done by my colleague, Mr S. G. Brown, who has published some of the results so far obtained in several papers. Among these are two papers on whales observed in the Indian and Atlantic Oceans (1957, 1958). These have brought out a number of facts which could scarcely have been demonstrated by any other means. For example, the relatively high concentration of whales in the Gulf of Aden and Arabian Sea, and their

* Editor's Note. This article was formerly published in the July 1966 edition of *The Marine Observer*. It is reprinted here for information and is updated by the notes which follow.

scarcity in the central Indian Ocean are clearly established, and the fact that whales are widely scattered over the Atlantic and Indian Oceans, and not grouped towards the continental coasts, has an important bearing on certain problems of the location of the breeding grounds and migration routes. Again the estimates of numbers seen per thousand miles' steaming provide for the first time a rough basis for comparing population densities in different parts of these oceans with densities in the Antarctic, which is the only ocean region in which good estimates of numbers of whales have yet been made.

Mr Brown has also published a paper (1961) on the distribution and behaviour of pilot whales, *Globicephala*, in the North Atlantic Ocean. This is based on records received from Ocean Weather Ships and some merchant vessels and the observations provide new information on the seasonal distribution and range of this species.

An interesting observation of swordfish and whales seen together provided the basis for a short study of the relationship of these two animals (Brown, 1960).

These are only examples from among the findings already published but the value to be extracted from the observations by no means ends with what has been published so far. Knowledge of such inaccessible and scattered animals as whales has to be gradually built up through the piecing together of such evidence as we can get from all available sources, including the marking of whales and the seasonal and geographical distribution of whaling. Taken as a whole, however, the recorded sightings alone have given us a broad view of the way in which the populations are spread through the oceans, which is of material assistance in planning other lines of work, or in suggesting where to look for further evidence on specific problems. Moreover they constitute a permanent fund of data for both predictable and unpredictable purposes in the future. There are further analyses of more recent observations to be made and of the distribution of the smaller Cetacea. There are also numerous observations on the behaviour, schooling, and movements of whales and smaller species, and at any time some new problem or hypothesis may be formulated for which evidence or support may be sought among the filed records.

The position now is that the scientific value of further accumulations of routine observations, at least on the normal shipping routes, can scarcely be sufficient to justify the trouble so kindly taken by observers in maintaining a look-out and recording the results. Therefore if any more of such routine reports are received they would now be put away with the filed data, to be referred to if necessary rather than be the subject of further special analysis.

This, however, does not apply to all kinds of reports, for it is thought well worthwhile to continue the collection of certain types of observation or of sightings from certain ships, as follows:

(a) From all ships: information (with date and position) of any exceptional numbers of concentrations of large whales, or of any remarkable incidents which seem worth recording. (Twelve or more large whales sighted in one day's steaming can be taken as an exceptional number.)

(b) Routine observations and reports as before, from naval, surveying, or research vessels, or any others on passages which depart from the normal shipping routes.

(c) Reports, etc., as before, from Ocean Weather Ships, since observations at more or less fixed points have a special value.

Copies of the booklet and forms for recording observations can still be supplied direct from the National Institute of Oceanography.

Although this article implies the winding up of the scheme of observations in its present form it does not exclude the possibility that some new reason may arise for resuming observations from as many ships as possible, but any such resumption would probably take the form of a newly organized scheme rather than of an extension of the present one.

Finally I should like to express, on behalf of the National Institute of Oceanography, our sincere thanks to all those who have contributed to the success of the scheme. It depended in the first place on the kind assistance and advice of Commander C. E. N. Frankcom and, in later years, of Lt Cdr L. B. Philpott. We are much indebted also to the Port Meteorological Officers through whom the invitations to record observations were distributed and the reports collected. Lastly we are specially grateful to numerous observers who voluntarily took so much trouble in watching for Cetaceans and for the clear and detailed reports they have supplied. Perhaps we may hope that such work occasionally went a little way to relieve the tedium of watch-keeping on long ocean voyages.

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# Notes on Whale Observing, 1976


BY S. G. BROWN

(Whale Research Unit, Institute of Oceanographic Sciences)


The above article by the late Dr N. A. Mackintosh indicated that although the scheme for the collection of observations of whales from ships was being terminated in 1966, records of certain sightings were still useful. The Whale Research Unit of the Institute of Oceanographic Sciences (formerly the National Institute of Oceanography) continues to be interested in receiving observations in the three categories mentioned in the article and forms for recording observations are still available though the booklet is now out of print.

The identification of Cetaceans at sea can be difficult even for trained and experienced observers. For this reason, records of sightings in all three categories should include as much information as possible about the animals. Important details are their estimated size (with a note of any smaller animals seen in the same school), the number present, their colour, the appearance of the 'blow' in large whales and whether it is directed upwards, or forwards from the front of the head, the shape of the dorsal fin and its size in relation to the size of the animal, and any details of their behaviour.

In category (a) large whales may be defined as animals estimated to be 12 metres or more in length. A number of useful observations of concentrations of large whales have been received in recent years. In category (c) the personnel of the Ocean Weather Ships have continued to provide a most valuable series of records and these are now being analysed in detail.

The records which were received between 1952 and 1966 continue to be used in unpublished analyses of Cetacean distribution and a further paper incorporating some of the records has been published (Brown, 1975), as well as an account of some more recent records of the Southern Right Whale Dolphin (*Lissodelphis peroni*) (Brown, 1973). This dolphin with its striking black-and-white pattern and lack of a dorsal fin, is one of the very few dolphins which can be identified at sea with confidence by a competent observer who is not an expert on Cetaceans. Any further records of its occurrence with detailed notes of the sighting will be of interest.

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1975 Relation between stranding mortality and population abundance of smaller Cetacea in the north-east Atlantic Ocean. *J. Fish Res Bd, Can*, **32**, pp. 1095–1099.


## LONG ASSOCIATION WITH SHIPOWNERS—LYLE SHIPPING COMPANY LIMITED

Continuing our practice of annually publishing an illustrated feature concerning ships of one owner, this year we continue with vessels of Lyle Shipping Company Limited. (See photographs opposite page 84.)

Although the present Lyle Shipping Company was registered as recently as 1920, the history of the 'Cape Line' goes back to 1872 and the Lyle interest in shipping considerably further than that.

After the death of his partner in 1872, Abram Lyle took into his own hands the management of certain ships of the 'Diamond K' Line, which sailed not only to the West Indies but to the East Indies also, in the sugar trade. The four ships concerned were the wooden-hulled *Queen of the Lakes*, built in 1864 and the iron-hulled *Colmonell*, *Java* and *Zanzibar*, built 1868–71.

Abram Lyle acquired exclusive ownership in 1873 and in due course, with the exception of *Queen of the Lakes*, the ships were renamed *Cape Wrath*, *Cape Comorin* and *Cape Horn*.

The Meteorological Office's first acquaintance with the company was made when the *Cape Wrath* (1255 g.r.t.) was recruited into the Voluntary Observing Scheme on 10 May 1880; this was followed by the recruitment of *Cape St Vincent* (1504 g.r.t.) in 1881, *Cape Verde* (1786 g.r.t.) in 1886 and *Cape Clear* (2350 g.r.t.) in 1887, as the Cape Line had now been building their own ships for some time. Of the above-named ships, *Cape Wrath*, *Cape St Vincent* and *Cape Verde* were iron sailing-ships whilst *Cape Clear* was an iron steamship.

The first ship from which meteorological logbooks are still in existence is the *Cape St Vincent*, in 1881, commanded by Captain J. C. Prout. *Cape St Vincent* sailed from Dundee on passage to San Francisco on 19 May 1881 and reached her destination on 24 September 1881. The continuation of this logbook does not cover the whole homeward passage, but on one occasion between 9 and 10 January 1882 in position (approx.) 37°S and 28°W, bound for the English Channel, an extract from Captain Prout's logbook reads: wind NNW 12, backing SW 12 and finally backing to S'ly Force 1, over a period of 20 hours. In the remarks column the following was entered in extremely neat and legible handwriting:

'9 January 1882—7.30 p.m. Rapidly increasing breeze with heavy squalls and threatening weather. Put ship under three lower topsails and reefed upper fore and main topsails. At 10.30 p.m. barometer stood 29·646 inches. At 11.45 it had fell to 29·372 inches. When a tremendous Hurricane burst on us like thunder. Everyone thought the ship would go right over; the lee side was completely out of sight and the sea frightful. We got the two reefed topsails spilled up and the lower fore and Mizen topsails clewed up.

'At midnight barometer was steady. Wind moderated to about Force 7 for half-an-hour which gave us an opportunity to make fast our sails. At 12.30 a.m. (10 January 1882) wind blew suddenly out of the SW. I thought nothing would stand, the ship came up head to sea. Which was tremendous. One sea coming over the bow and the next over the stern. Immediately the outburst came the glass began to rise rapidly and at 3 a.m. it stood 29·575: gale abating. The sky cleared for 20 minutes without a speck of cloud and never saw the stars so large and bright before.

'At 9 a.m. made all plain sail.

'I am afraid some of my brother seamen who have not so good ships as the *Cape St Vincent* have met with trouble'.

Captain Prout's first two meteorological logbooks were classed as excellent after this voyage.

A photograph of the first *Cape Wrath* recruited in 1880 is unobtainable so our first photograph portrays *Cape of Good Hope* which like *Cape Wrath* was an 'Iron Ship', was in the Lyle Fleet at the same time (1876–94) and was of generally similar dimensions.

Our second photograph shows s.s. *Cape Ortegal* (I) of 4896 g.r.t. and was built in 1911 by Russell and Company, Port Glasgow. Although damaged during World War I, she survived and was finally sold in 1936. At the outbreak of the first World War the Lyle Fleet consisted of five ships but by 1918 they had been reduced to two.

The years between the wars were lean ones for British shipowners; at one time, 1922, the fleet was reduced to a single ship, but by 1924 Lyles again started buying and building ships and by 1934 had increased their fleet to ten ships.

When World War II began Lyles owned ten ships of which only four remained at the cessation of hostilities; only one of these had been in the pre-war fleet.

Our third picture, although not the latest ship to be built for the company, is named *Cape Wrath* again, the fourth ship to carry the name. Built in 1968, of 13 532 g.r.t., she was recruited into the Voluntary Observing Fleet in April 1969 and has given us consistent service ever since.

The periods are rare when we have not had at least one of Lyle Shipping Company vessels on our list over the 96 years of association with the company. At the present time out of a fleet of eleven ships, seven of these are Selected ships in the Voluntary Observing Fleet.

It gives us great pleasure to have this opportunity of expressing our gratitude to the Lyle Shipping Company Limited and to all their masters and officers who have assisted us so enthusiastically over the years.

J. D. B.

## PORT METEOROLOGICAL OFFICE, CARDIFF

As many of our readers will already be aware, the Port Meteorological Officer has recently moved to 33 The Hayes, Cardiff after twenty-seven years at No. 2 Bute Crescent in Butetown. Prior to the appointment of a Port Meteorological Officer to Cardiff, in 1949, Captain E. Hall had been the Merchant Navy Agent for the Bristol Channel ports for many years. Captain Hall had his office in the Exchange Building in Mount Stuart Square at the bottom of Bute Street. Incidentally, the Exchange Building has recently been modernized and renovated, and it is still the focal point for Cardiff's coal and shipping interests on which the growth and prosperity of Cardiff, both as a city and a port, were founded.

With the proposed appointment of a Port Meteorological Officer, new office accommodation was sought and was eventually found in the former offices of the Port Health Authority at No. 2 Bute Crescent. This office nestled comfortably between 'Thisbe House', the home of the Missions to Seamen, and the 'Mountstuart Hotel', a familiar landmark to mariners on account of its proximity to the main dock gates! Thus, the mariner was able to satisfy both his spiritual and physical needs in Bute Crescent in those days.

Although Captain R. Reid had been appointed Port Meteorological Officer Glasgow, it was he who opened the new office in Bute Crescent early in 1949. Mr J. C. Matheson had been officially appointed to Cardiff, but he was away at sea at this particular time. However, Mr Matheson arrived in Cardiff in August 1949, and took over the reins from Captain Reid. As suitable office accommodation had still not been found in Glasgow, Captain Reid was temporarily posted to the Marine Division at Headquarters, which was situated in Harrow in those days. A further year was to pass before Captain Reid was able to take up his post in Glasgow.

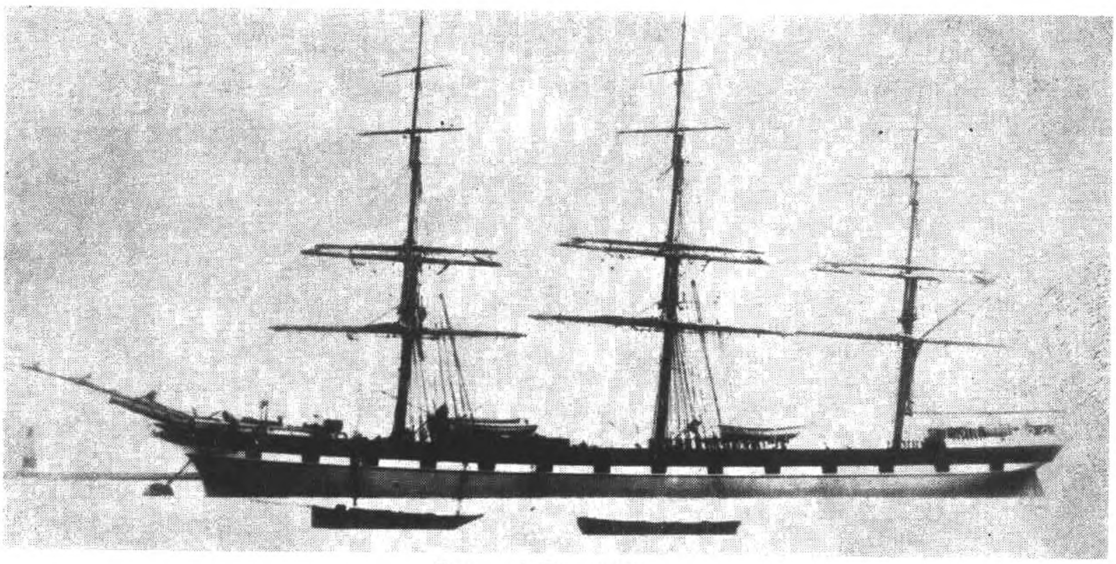
Mr Matheson remained in Cardiff until he gained promotion to Senior Nautical Officer and was subsequently appointed as Port Meteorological Officer to the port of London in August 1955. Captain A. D. White was temporarily appointed to Cardiff in the meantime prior to taking up his appointment as Deputy Marine Superintendent in Harrow. However, in December 1955, Captain F. C. Jones arrived at No. 2 Bute Crescent, and he was to remain there for sixteen years, until he retired in January 1972. Captain Jones was responsible for all the Bristol Channel ports from Fishguard in the north to Portishead in the south. He also took the ports of Falmouth and Plymouth under his wing for a number of years when there was no Port Meteorological Officer in Southampton. Captain Jones still resides in Cardiff and his familiar figure is frequently sighted in the city.

Mr D. J. F. Southon succeeded Captain Jones in Cardiff in 1972. By this time, No. 2 Bute Crescent and its immediate neighbourhood had become rather dilapidated and uncared-for on account of the decline of the coal trade, on which the area had depended for its development and prosperity for so many years. Time had passed Butetown by, and it had only memories of its former glorious and prosperous days when 'King Coal' ruled supreme. Consequently, it was decided to move the office to the centre of Cardiff, where it would be considerably more accessible to officials of the various shipping companies, students and lecturers of the nautical colleges and to members of the general public. A suitable site was eventually located by Mr Southon, not without a great deal of searching.

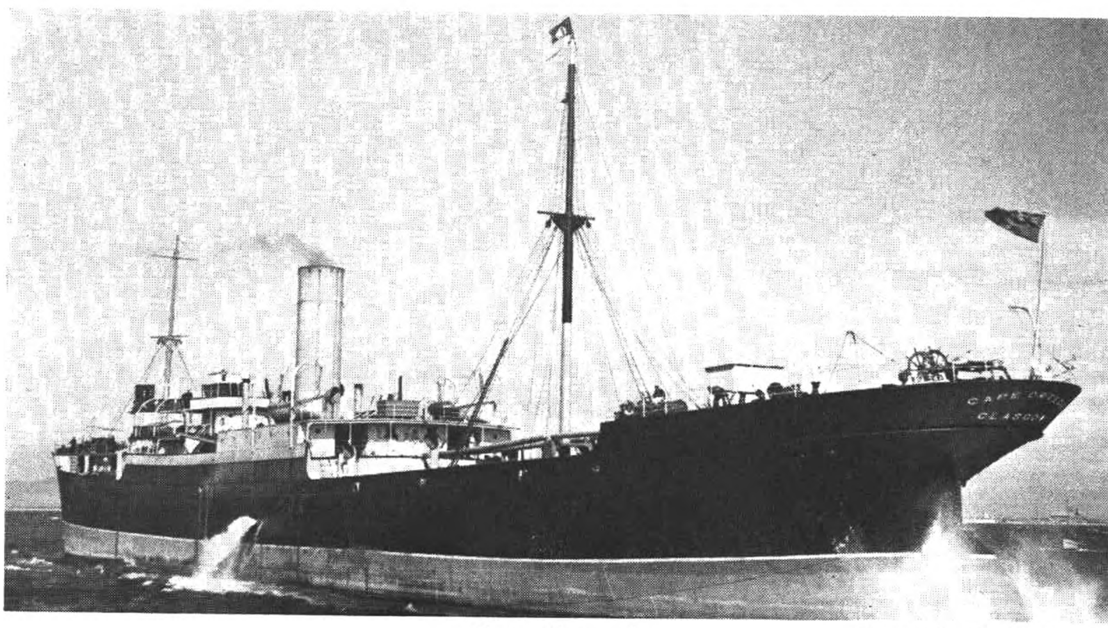
The site was approved in June 1974 and Mr Southon submitted the plans for the alterations which would be required to adapt the site for use as a Port Meteorological Office. The plans were approved and dispatched to the District Works Officer for execution.

On completion of the legal details and the physical alterations the day finally dawned when Mr Southon and his assistant, Mr Atkinson, were able to move their stocks of instruments, equipment, stationery and other 'impedimenta' from Bute Crescent to the new office in The Hayes. The 'Hayes' office officially became operational on Monday, 10 November 1975 and ended our long and happy association with Bute Crescent.

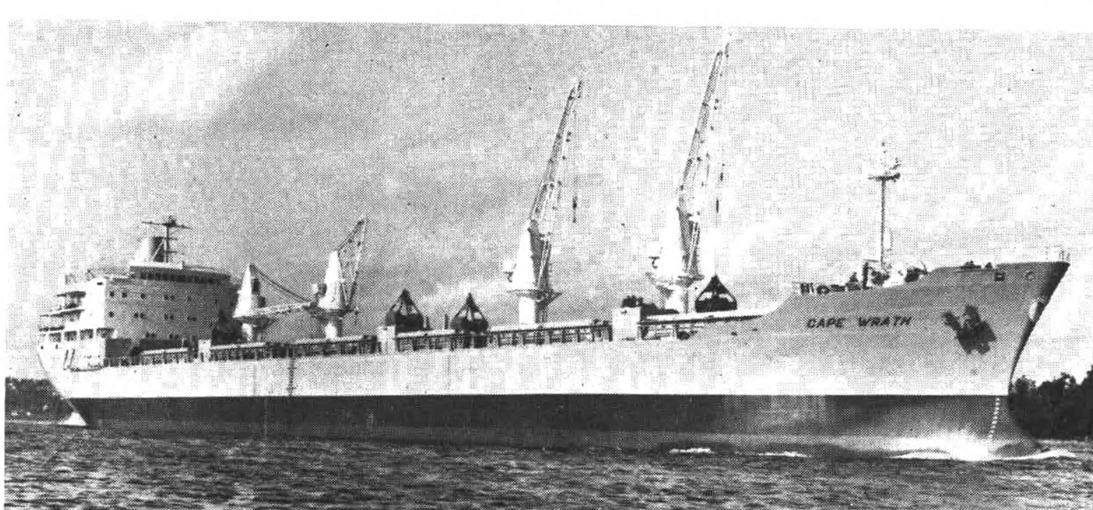
(Opposite page 84)



*Cape of Good Hope*



*Cape Ortegal* *Copyright F. W. Hawke*




*Cape Wrath IV*

VESSELS OF LYLE SHIPPING COMPANY LIMITED (*see* page 82).

(*Opposite page* 85)


Hayes House

Interior of the new office

THE NEW PORT METEOROLOGICAL OFFICE, CARDIFF (*see* page 84).

The Cardiff Port Meteorological Office is now situated at 33 The Hayes, immediately above that of Powell Duffryn Travel Ltd, and access is gained from the first-floor car park at the rear of Hayes House. Mr Southon would take this opportunity to extend a very sincere invitation to all mariners to call in at the new office, whenever they are in the vicinity, whether it be a business or simply a social call. So do 'pop in' and see the 'Port Met-man' at home. He would be grateful to have the opportunity of reciprocating just a little of the generous hospitality which has been extended to him by many of you when he has visited your ships in the course of his daily duty.

Photographs of the new Port Meteorological Office accommodation are shown opposite this page.

D. J. F. S.

## ICE CONDITIONS IN AREAS ADJACENT TO THE NORTH ATLANTIC OCEAN FROM OCTOBER TO DECEMBER 1975

The charts on pages 87 to 89 display the actual and normal ice edges (4/10 cover), sea-surface and air temperatures and surface-pressure anomalies (departures from the mean) so that the abnormality of any month may be readily observed. (The wind anomaly bears the same relationship to lines of equal pressure anomaly as wind does to isobars. Buys Ballot's law can therefore be applied to determine the direction of the wind anomaly.) Southern and eastern iceberg limits will be displayed during the iceberg season (roughly February to July). In any month when sightings have been abnormally frequent (or infrequent) this will be discussed briefly in the text.

The periods used for the normals are as follows. Ice: 1966–73 (Meteorological Office). Surface pressure: 1951–66 (Meteorological Office). Air temperature: 1951–60 (U.S. 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 (U.S. Navy, 1967).

OCTOBER

Over the Barents Sea the extension of ice southwards was even more rapid than normal during October on account of anomalies of cold northerly winds. By the end of the month there was an excess of ice over normal, reversing the deficit that had been a feature over many recent months. Over the Greenland Sea offshore winds and below-normal temperatures reduced the deficit of the previous month so that by the end of October the ice edge was close to the normal position except near Spitsbergen where some deficit persisted. Although there was some deficit of ice off Scoresby Sound, the previous month's excess of pack ice along the south-east coast of Greenland persisted and because of refreezing and drift this ice extended further southwards to about 61°N. Ice fields developed slightly ahead of normal over north-west Baffin Bay.

NOVEMBER

The excess of ice in the Barents Sea persisted with an anomaly of cold north-easterly winds. Over the Greenland Sea anomalous onshore winds delayed the rapid eastwards extension of ice which is normally a marked feature during November. Further south though, the extension of ice south-eastward across the Denmark Strait was much as normal and by the end of the month the pack along the east coast of Greenland had extended a tongue of ice past Cape Farewell into the Davis Strait. The development of ice in Baffin Bay was near normal during the month. In Hudson Bay there was rapid freezing and, in the south, there was a considerable excess of ice over normal by the end of the month.

DECEMBER

With anomalously cold winds between Franz Josef Land and Greenland the deficit of ice over the Greenland Sea was much reduced during the month and the ice edge in the Denmark Strait lay south-east of its normal position, closely approaching north-west Iceland by the end of December. The freezing of Hudson Bay and Baffin Bay was rapid and, with offshore winds and below-normal temperatures, ice spread southwards along the coast of Labrador more quickly than usual, passing Belle Isle by the end of the month. Ice also formed further west than normal in the Gulf of St Lawrence.

REFERENCES


Meteorological Office, London — 1966 — Monthly meteorological charts and sea surface current charts of the Greenland and Barents Seas.

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

U.S. Department of Commerce Weather Bureau, Washington, D.C. — 1965 — World weather records, 1951–60. North America.

U.S. Naval Oceanographic Office, Washington, D.C. — 1967 — Oceanographic atlas of the North Atlantic Ocean, Section II: Physical properties.


## Baltic Ice Summary: October–December 1975

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

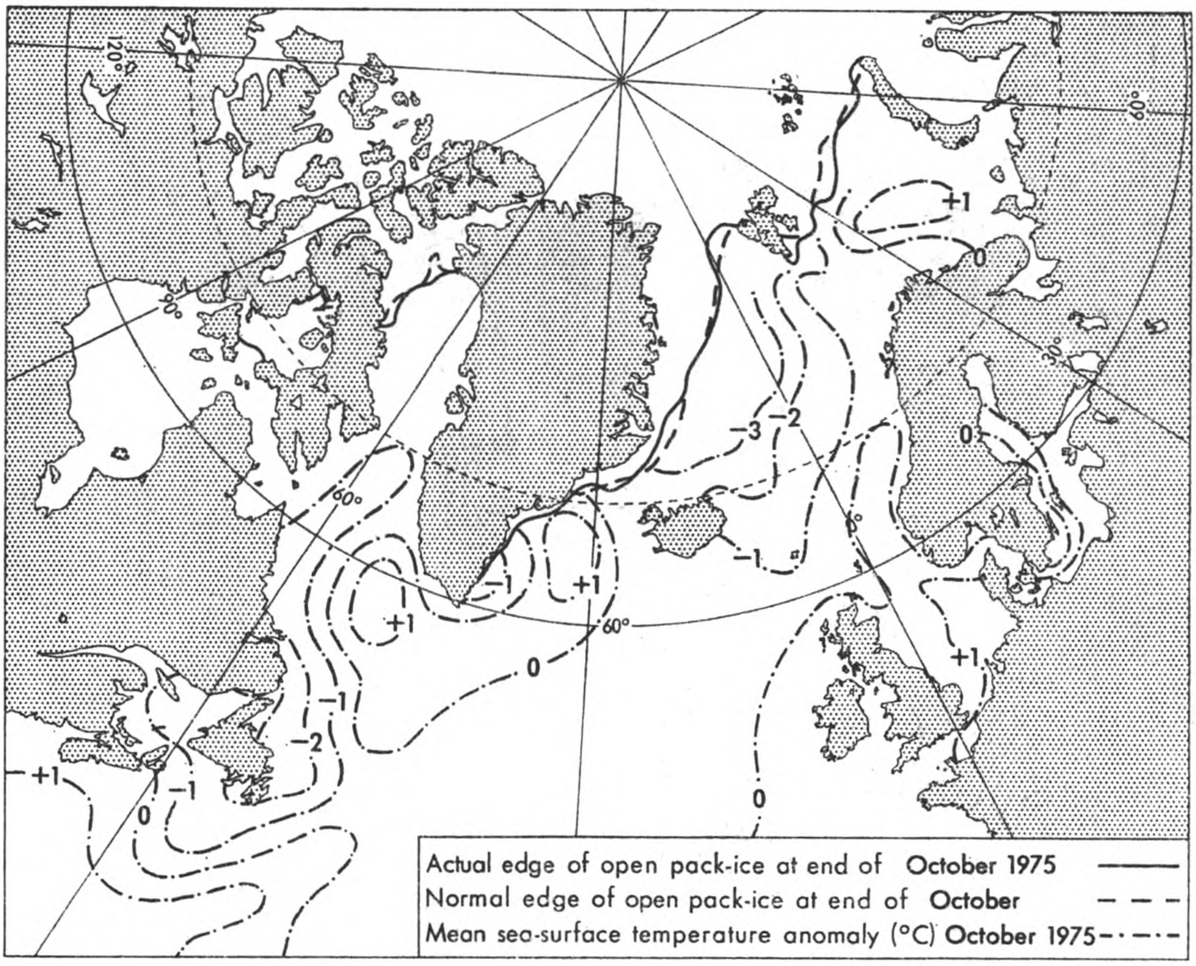
No ice was reported at any of the stations in October.

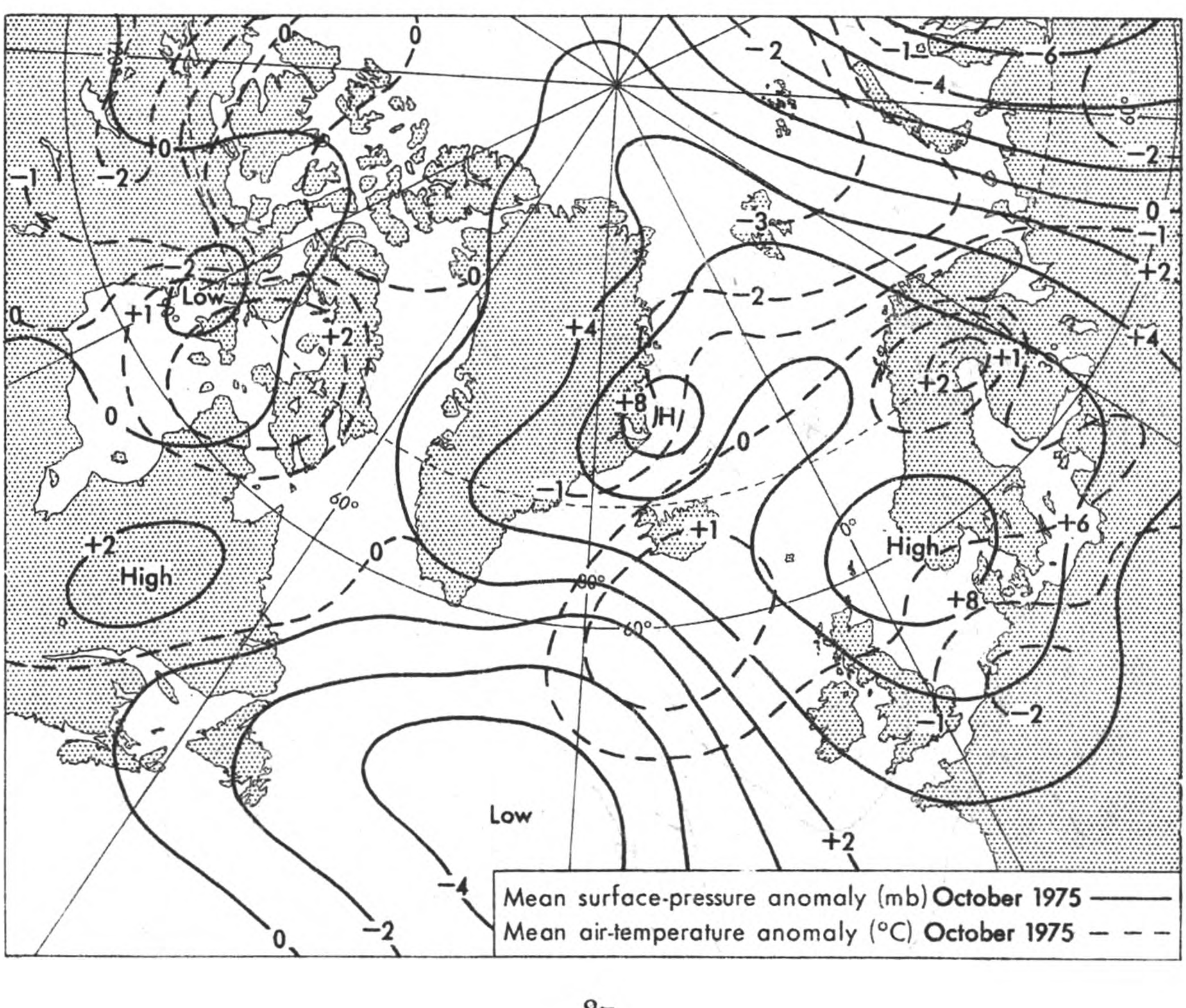
| STATION | NOVEMBER | | | | | | | | | DECEMBER | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LENGTH OF SEASON | | ICE DAYS | | | NAVIGATION CONDITIONS | | | ACCUMULATED DEGREE DAYS | LENGTH OF SEASON | | ICE DAYS | | | NAVIGATION CONDITIONS | | | ACCUMULATED DEGREE DAYS |
| | A | B | C | D | E | F | G | H | I | A | B | C | D | E | F | G | H | I |
| Leningrad | 24 | 30 | 7 | 0 | 0 | 7 | 0 | 0 | 55 | 1 | 31 | 29 | 1 | 24 | 18 | 11 | 0 | 137 |
| Pyarnu .. | 24 | 30 | 6 | 0 | 0 | 0 | 0 | 0 | — | 1 | 31 | 31 | 12 | 2 | 17 | 0 | 0 | — |
| Viborg .. | 24 | 29 | 6 | 0 | 0 | 6 | 0 | 0 | — | 1 | 31 | 31 | 29 | 0 | 20 | 11 | 0 | — |
| Klaipeda | 27 | 30 | 4 | 0 | 0 | 0 | 0 | 0 | — | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | — |
| Vaasa .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 11 | 31 | 21 | 12 | 0 | 12 | 0 | 0 | 95 |
| Oulu .. | 24 | 30 | 7 | 7 | 0 | 7 | 0 | 0 | — | 1 | 31 | 31 | 31 | 0 | 18 | 13 | 0 | — |
| Poytaa .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | — | 10 | 31 | 13 | 1 | 0 | 12 | 1 | 0 | — |
| Luleå .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 8 | 31 | 24 | 24 | 0 | 20 | 4 | 0 | 287 |
| Skellefteå | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | — | 20 | 27 | 5 | 0 | 0 | 2 | 0 | 0 | — |

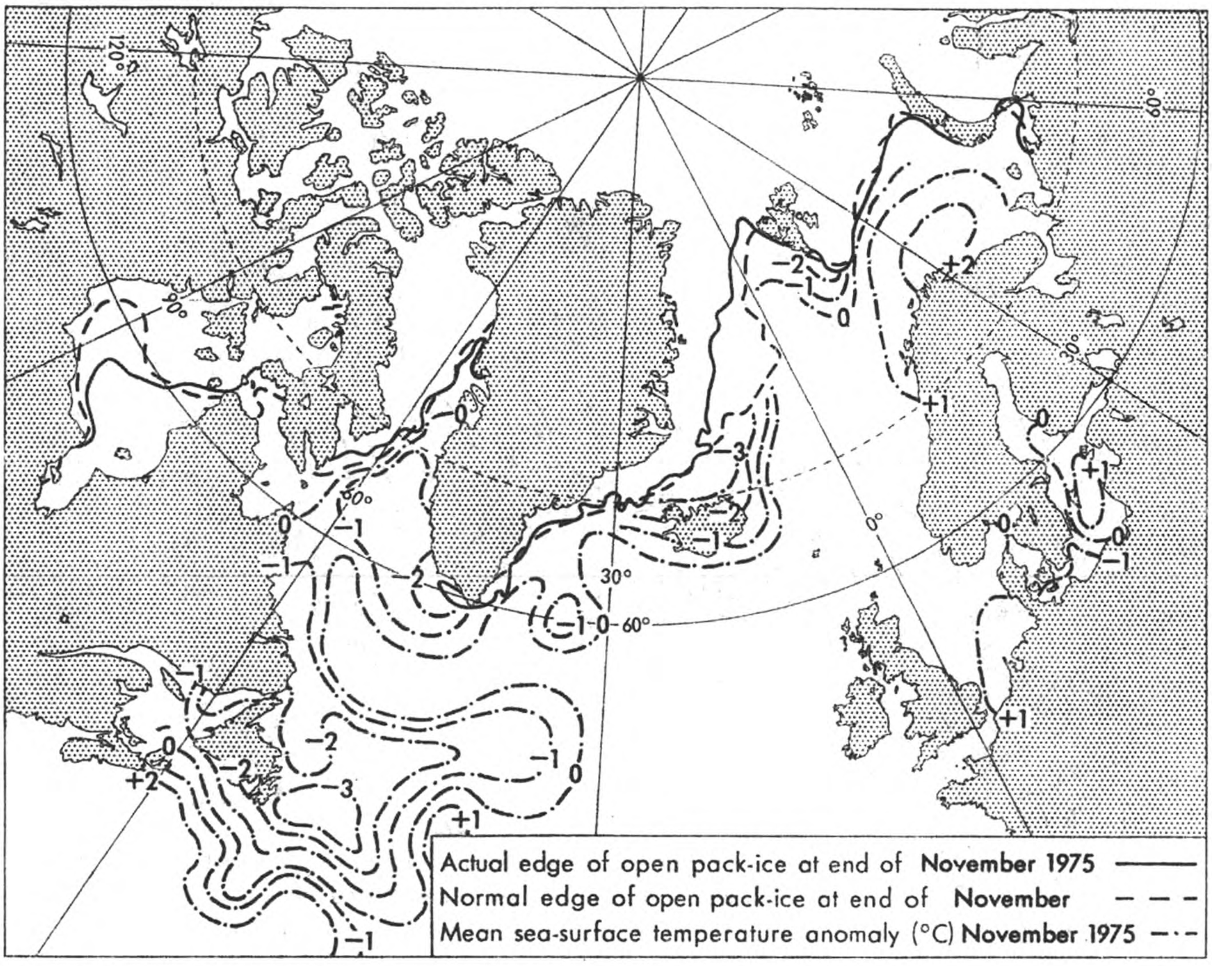
CODE:

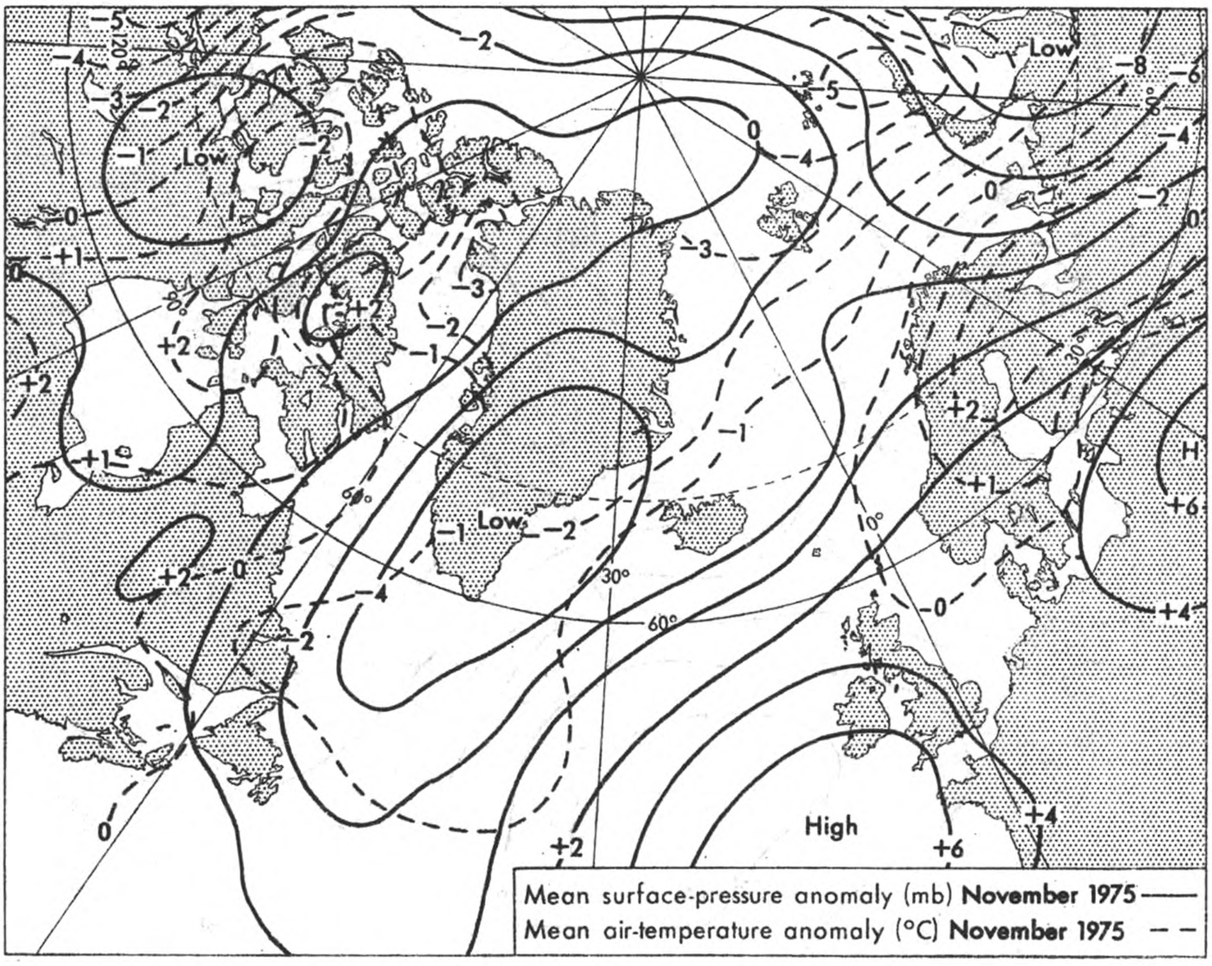
A First day ice reported.
B Last day ice reported.
C No. of days when ice was reported.
D No. of days continuous land-fast ice.
E No. of days of pack ice.
F No. of days dangerous to navigation, but assistance not required.
G No. of days assistance required.
H No. of days closed to navigation.
I Accumulated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

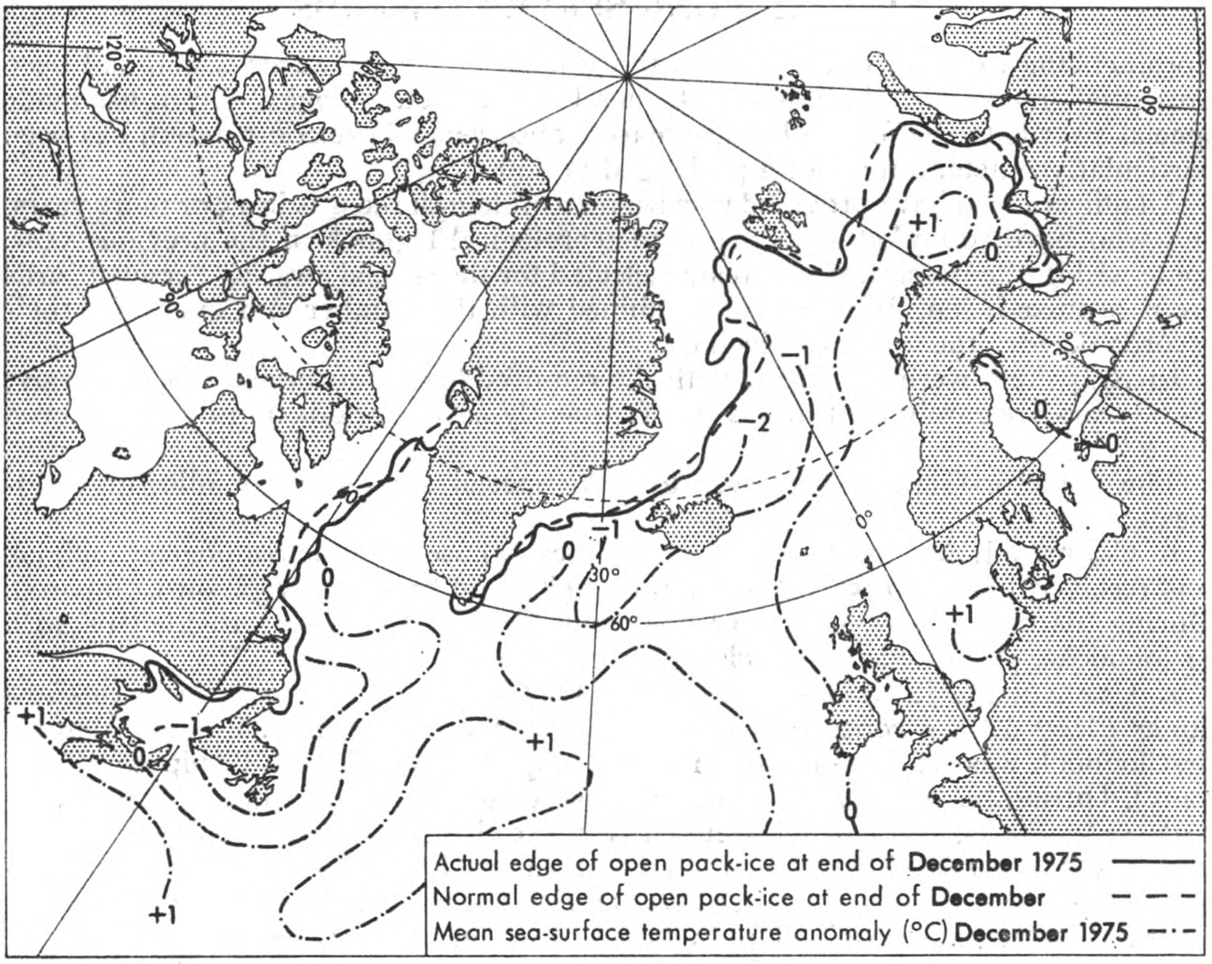
* These figures give a rough measure of the first probability of the formation of sea ice, and later the progress of the growth and its thickness. They are derived from daily averages of temperature (00 + 06 + 12 + 18 GMT) and are the sum of the number of the degrees Celsius below zero experienced each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

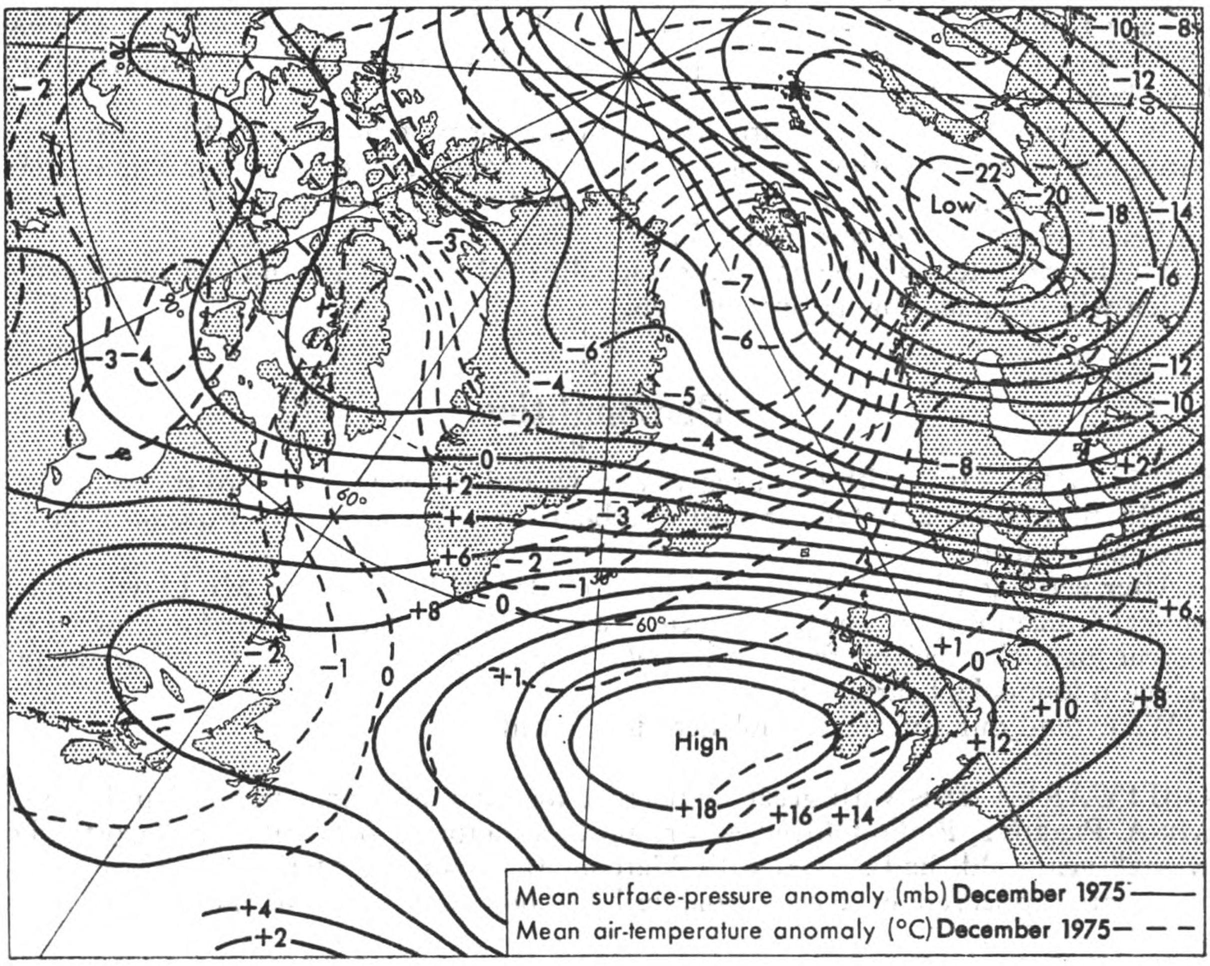

Actual edge of open pack-ice at end of October 1975
Normal edge of open pack-ice at end of October
Mean sea-surface temperature anomaly (°C) October 1975


Low
High
Mean surface-pressure anomaly (mb) October 1975
Mean air-temperature anomaly (°C) October 1975


Actual edge of open pack-ice at end of November 1975
Normal edge of open pack-ice at end of November
Mean sea-surface temperature anomaly (°C) November 1975


Low
Low
Low
High
Mean surface-pressure anomaly (mb) November 1975
Mean air-temperature anomaly (°C) November 1975


Actual edge of open pack-ice at end of December 1975
Normal edge of open pack-ice at end of December
Mean sea-surface temperature anomaly (°C) December 1975


Low
High
Mean surface-pressure anomaly (mb) December 1975
Mean air-temperature anomaly (°C) December 1975

## SPECIAL LONG-SERVICE AWARDS

Commencing in 1948, in addition to the annual Excellent awards which had been presented since 1924, the Director-General of the Meteorological Office has made special awards to the four voluntary marine observers whose contribution has been particularly outstanding over a prolonged period.

All officers who have provided us with meteorological records in 15 or more years, and who have compiled at least one meteorological logbook in the previous year, come within the possibilities of being selected for the special awards. Personal cards are scrutinized; length of service combined with the number and quality of their records decides the order of placings.

In 1974 there were 99 officers with the required length of service, over 15 years; these years are rarely continuous and frequently cover periods of 30 years or even more.

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

1. CAPTAIN J. M. BURN, of P. & O. Lines, whose first meteorological logbook was received here in 1951 from s.s. *Dorset* (Federal Steam Navigation Company). During his 22 years of voluntary observing Captain Burn has provided us with 34 logbooks, 30 of which were classed Excellent.

2. CAPTAIN M. J. HERON, also of P. & O. Lines, at present serving with Container Fleets Ltd, a consortium of which P. & O. is a member. Captain Heron's first logbook was received in 1947 from s.s. *Pipiriki* (New Zealand Shipping Company). During his 22 years of voluntary observing, Captain Heron has provided us with 43 logbooks, 33 of which were classed Excellent.

3. CAPTAIN D. S. MILLARD, Manchester Liners Ltd, who sent us his first logbook in 1946 from s.s. *Manchester City*. During his 25 years of voluntary observing Captain Millard has provided 49 logbooks of which 19 were classed Excellent.

4. CAPTAIN A. F. ASHTON, Bibby Brothers & Company, sent us his first logbook in 1954 from s.s. *Empress of Australia* (Canadian Pacific Steamships Ltd). During 20 years as a voluntary observer Captain Ashton has sent us 49 logbooks of which 37 have been classed Excellent.

As in former years, the award will be in the form of an appropriately inscribed barograph, and it is with great pleasure that we congratulate these four shipmasters on this acknowledgement of their many years of zealous voluntary observing at sea on behalf of the Meteorological Office.

The four masters will be notified personally of the award and of the arrangements which will be made for its presentation.

J. D. B.

# Personalities

OBITUARY.—It is with great regret that we rather belatedly record the sad death of MR B. LLOYD, 2nd Officer, lost overboard from m.v. *Booker Vanguard* on 15 December 1974.

After serving with Shaw Savill Line and British Rail Ferries Mr Lloyd joined Booker Line in August 1973. Our records show that his name appeared in a meteorological logbook received from m.v. *Delphic* in August 1960 and thereafter we received 9 logbooks bearing his name.

We extend our sincere condolences to his widow.

OBITUARY.—It is with great regret that we have to record the sudden death of MR A. PERROTT, Radio Officer, as a result of a motoring accident. Mr Perrott, who was 28 years old, had served with Marconi International Marine Co. since 1966. His name appeared in a meteorological logbook received from the *Volvatella* in 1968.

We extend our sincere condolences to his family.

OBITUARY.—We deeply regret to record the death of CAPTAIN J. WISE, Master of m.v. *Albright Explorer* whilst in Leningrad last November.

A Cornishman from Liskeard, Captain Wise served his apprenticeship with Ellerman Lines. He then joined the Royal Fleet Auxiliary where he served as Third and Second Officer and also had the misfortune to be torpedoed twice on convoys to Russia.

He next served ten years with Cunard Steamship Company as Third, Second and Chief Officer. As a Lieutenant Commander R.N.R. he was appointed Queen's Flag Officer to the Queen Mother when she made a voyage on the *Queen Elizabeth* just after the war.

Later he served another ten years with the South African Marine Corporation as Chief Officer, Master and Superintendent before joining Albright and Wilson Limited as Chief Officer in 1967, being appointed Master with this Company in 1968.

Captain Wise sent us his first meteorological logbook in 1953 from the *Franconia.* Since then we have received a further 20 logbooks bearing his name.

We extend our sincere condolences to his widow.

RETIREMENT.—CAPTAIN I. R. ATKINSON retired recently after 44 years at sea.

Ivor Roland Atkinson was born in County Durham and first went to sea in 1931 with United Steam Navigation Co. His father and grandfather were Master Mariners before him. He obtained his 2nd Mate's Certificate in 1935 and remained with United Steam Navigation Co. as a junior officer until 1938 when he joined Alfred Holt and Company.

After a period of service with the Royal Canadian Navy, he obtained his Master's Certificate in 1946. His first command was m.v. *Ascanius* in May 1957 and since then, apart from six months ashore as Assistant Marine Superintendent, he has commanded a number of Ocean Fleet's vessels, his last ship being m.v. *Patroclus.*

During the war Captain Atkinson had the misfortune of being twice torpedoed and sunk, first in m.v. *Eumaeus* off Sierra Leone and a year later in m.v. *Cyclops* off Nova Scotia. On joining the Royal Canadian Navy he specialized in gunnery and during the latter part of his Naval service helped to form what is now the Canadian Coast Guard.

Our records show that Captain Atkinson sent us his first meteorological logbook in 1963 from the *Glenroy.* Since then we have received a further 34 logbooks bearing his name of which no less than 30 have been classed as Excellent. He received Excellent Awards in 1964, 1965, 1968, 1969, 1973, 1974 and 1975.

We wish him a long, healthy and happy retirement in his home in Sunderland.

RETIREMENT.—MR D. C. H. FRANKLIN, Radio Officer, recently retired from The Marconi International Marine Company after 43 years' service at sea.

During his career Mr Franklin did much valuable work for the Meteorological Office as Radio Officer and received an Excellent Award for his services in 1962 whilst serving in the *Beaverdell.*

We wish him health and happiness in his retirement.

RETIREMENT.—CAPTAIN G. L. HOWE retired last December from the R.R.S. *Discovery.*

Geoffrey Luther Howe first went to sea as an apprentice in the *British Merchant* in 1928. After serving with British Tanker Co., Ltd, for eight years he then spent short periods with Court Line and the Baltic Trading Co., Ltd before joining Lago Shipping Co. (Mosquito Fleet) soon after obtaining his Master's Certificate in 1939. He remained with Lago Shipping Co. in their tanker and dredging fleet in Lake Maracaibo until it was disbanded in 1954, during the last five years of which service he was in command and also dredge master.

After spending some years ashore he returned to sea as 2nd Officer with the Royal

Fleet Auxiliary. He was promoted to Chief Officer in 1965 and appointed to R.R.S. *Discovery*. When that vessel was placed under the Natural Environment Research Council in 1969 he was promoted to command of the *Discovery* where he remained until his recent retirement.

Captain Howe sent us his first meteorological logbook from the *Discovery* in December 1965. Since then we have received a further 29 logbooks from him of which 11 have been classed as Excellent. He received Excellent Awards in 1970, 1973 and 1974.

We wish him a long, healthy and happy retirement in his home at Crowthorne.

RETIREMENT.—CAPTAIN M. PATTERSON retired last October after 20 years service with Shell Tankers (U.K.) Ltd.

Michael Patterson joined Anglo Saxon Petroleum Co. in September 1955 as 3rd Officer and was appointed to s.s. *Vibex*. After promotion through the ranks he was appointed Master of s.s. *Hemiplecta* in 1969. Since then he has commanded many of Shell Tankers' vessels, his last ship being s.s. *Amastra*.

Whilst serving in the *Amastra* as Chief Officer, he was presented with a meritorious award by his Company for salvage operations carried out during an incident in Vietnam.

Captain Patterson sent us his first meteorological logbook in 1967 whilst serving in the *Amastra* and since then we have received a further eight logbooks bearing his name.

We wish him health and happiness in his retirement.

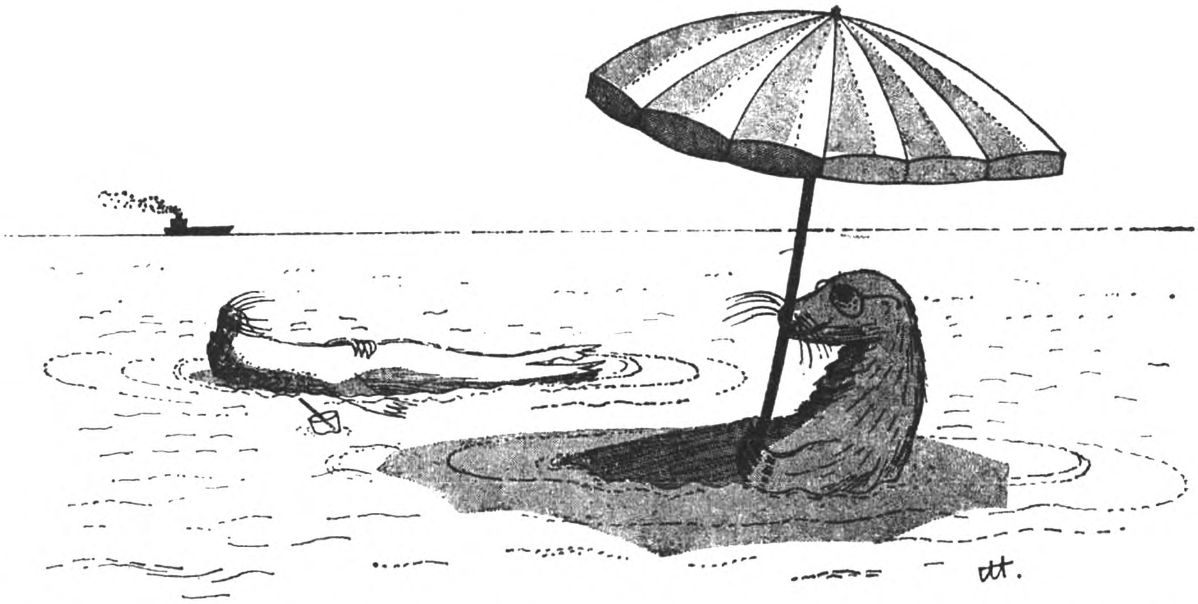
RETIREMENT.—CAPTAIN R. A. WIGHT retired last October after serving 43 years with Port Line.

Ralph Arthur Wight joined Port Line in 1932 and for the last 20 years has been in command, his last ship being the *Port Nicholson*.

Captain Wight sent us his first meteorological logbook in 1937 from the *Port Wellington*. Since then we have received a further 25 logbooks bearing his name of which 12 have been classed as Excellent. He received Excellent Awards in 1966, 1967, 1968, 1970 and 1971.

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

## THE LIGHTER SIDE



*See* observation by s.s. *Benlomond* 'Penguins and Seals' in *The Marine Observers' Log*, page 63.

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