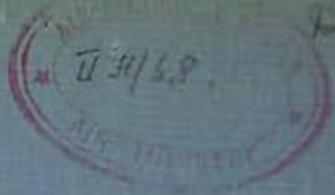


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# COASTAL COMMAND REVIEW

April, 1943

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No. 12

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HEADQUARTERS,  
COASTAL COMMAND  
ROYAL AIR FORCE

# COASTAL COMMAND REVIEW

No. 12—April, 1943

## CONTENTS

	<i>Page</i>
<b>Summary of the Month's Work : April, 1943</b> .. .. .	1
<b>I.—Anti-Submarine</b>	
Anti-Submarine Operations in April .. .. .	3
Recent Attacks on Submarines .. .. .	5
Trade Protection : Recent Convoys .. .. .	10
The Use of the Form UBAT .. .. .	15
<b>II.—Anti-Shipping</b>	
Offensive against Enemy Shipping .. .. .	17
Torpedo Operations in April .. .. .	18
Details of Operations .. .. .	18
Shipping Attack off Dutch Coast .. .. .	20
Far Eastern Blockade Running (with chart) .. .. .	20
<b>III.—Other Operational Flying</b>	
Air-Sea Rescue in 19 Group .. .. .	21
Halifax Meets Seven Ju.88's .. .. .	22
<b>IV.—Specialist and General Articles</b>	
Ice Reconnaissance .. .. .	23
Leaves from a Navigator's Log Book—No. V .. .. .	25
A Letter from Nassau .. .. .	26
Effectiveness of Bombing Practice .. .. .	26
On the Way to Gibraltar .. .. .	27
Use of Binoculars by Visual Lookouts .. .. .	28

<i>Plate</i>	<b>PLATES</b>	<i>Facing page</i>
1	1. Sweep of Nine R-Boats .. .. .	2
1	2. A Typical Undershoot .. .. .	2
2	1. Attacks by a Hudson and a Whitley .. .. .	3
2	2. First Class Attack by N/120 .. .. .	3
3	Incidents during Attack on a Convoy off Vlieland, April 29 .. .. .	14
4	A further photograph of Attack off Vlieland .. .. .	15
5	Attack by S/120 .. .. .	16
6	Three photographs of Attack by 144 Squadron on April 27 .. .. .	17
7	Attack made by 143, 236 and 254 Squadrons on Convoy off Texel .. .. .	20 and 21
8		
9	Hits on Enemy Shipping by 489 Squadron on April 4 and April 9 .. .. .	22
10	Drift Ice and Packed Drift Ice .. .. .	23

<i>Chart</i>	<b>CHARTS</b>	<i>Page</i>
1	U-Boats Sighted and Attacked by Aircraft from Newfoundland .. .. .	2
2	Anti-Submarine Activities, April .. .. .	4
3	Charts showing Sightings and Attacks by Aircraft covering S.C.122 and HX.229 .. .. .	12
4	The Use of the Form UBAT .. .. .	15
5		
6	Far Eastern Blockade Running .. .. .	facing 20
7	Ice Reconnaissance, February 6, 1943 .. .. .	24

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“While this book is, of necessity, issued as secret, and no part of it must be communicated to anyone outside the Services, it is intended for the information of all officers but principally of all members of aircrews, under conditions of security approved by the Commanding Officer. The whole purpose of producing it would be frustrated if it were relegated to the interior of an official safe.”

*The Air Officer Commanding-in-Chief,  
Coastal Command.*

# SUMMARY OF THE MONTH'S WORK

April, 1943.

1. April 1943 was a bumper month for Coastal Command. Both the anti-submarine and the torpedo squadrons, with the support of their affiliated fighter units, have established a record for the Command. There have been during the month 150 sightings and 86 attacks on U-Boats by the squadrons in the United Kingdom, at Gibraltar and in Iceland, including No. 84 Squadron, U.S. Navy which, though not under the orders of Coastal Command, we have come to regard as one of our team. It is, of course, as yet too early for all the attacks to have been assessed. We can, however, say that we killed four U-Boats; three more look reasonably certain on a provisional assessment; and that hard-hearted and unimaginative body, the Admiralty Assessment Committee, may ultimately credit us with as many as eight. One of the certain kills was by a torpedo Hampden (using 250-lb. D.Cs.) of No. 455 Royal Australian Squadron. The Whitleys of No. 10 O.T.U. detachment at St. Eval have, as usual, done excellent work with a total of 168 sorties in the month.

2. Another welcome success during the month which, though not by Coastal Command, should not pass without notice in this review, was the first blood to the Auxiliary Carriers—a Swordfish from H.M.S. *Biter* covering O.N.S.A, having disabled a U-Boat which was subsequently finished off by the destroyer *Pathfinder*. This is a very important development. Even when we have closed the "Gap" by V.L.R. aircraft from Newfoundland, there will still be areas of the Atlantic which cannot be covered from any shore base—and there are days when shore-based aircraft may be grounded by weather at base. We have long looked forward to the Auxiliary Carrier as a potentially important member of the A/S team, and now she has proved her value. Well done the Fleet Air Arm!

3. These facts, together with the provision of certain additional surface escort groups which it became possible to make available early in the month, no doubt account for the remarkably low level of sinkings in April. We have lost fewer ships in April than in any month (except January, 1943) since December, 1941. It is far too early yet to hang out flags and we cannot hope that every month will be as good as this. But if we continue to put out our utmost effort, and reduce the proportion of abortive attacks due to things like inadequate training and technical failures, we can look forward with sober confidence to breaking the back of the U-Boat menace.

4. April was the last month of the old system of responsibility for convoy cover in the Atlantic, and on May 1st, a new organization came into force which was drawn up by the Atlantic Convoy Conference held in Washington in March this year, at which Coastal Command was represented by the S.A.S.O., Air Vice Marshal Durston.

At this conference it was agreed that the United Kingdom and Canada should be responsible for the security of convoys across the North Atlantic, the United States providing certain air and sea forces to help them. From the Air Force point of view an interesting development was the setting up of an organization corresponding very closely to the Coastal Command system on this side of the Atlantic; Eastern Air Command at Halifax corresponding to H.Q.C.C. and No. 1 Group R.C.A.F. at St. John's to the Coastal Groups. All anti-submarine aircraft—whether R.C.A.F., U.S. or R.A.F.—based in Labrador, Newfoundland or Canada are under the general operational control of the A.O.C., Eastern Air Command, and the Group Commander, working in a combined Headquarters at St. John's with a Naval opposite number, is responsible for the air coverage of all shipping within his range.

But the most important point is that the United States intend to base a substantial force of V.L.R. aircraft in this region and, in fact, have already taken steps to put that intention into effect. That, combined with the V.L.R. Liberators of the R.C.A.F., which will soon be operating from Newfoundland, will close the gap in the North Atlantic, and the importance of that fact needs no emphasizing to anyone in Coastal Command. (See Chart, page 2.)

5. A significant development in April, was the number of occasions on which U-Boats sighted by aircraft have stayed on the surface and used their A.A. guns. But it is also significant that of the four U-Boats which are known to have been sunk in April (and, incidentally, the first one to be certainly sunk in May) all were rash enough to stay on the surface and fight back. Even a big aircraft is not an easy target for the gunners in the cramped gun-mountings of a U-Boat and a U-Boat in any sort of sea is a very poor gun-platform. The provision of forward firing guns in all A/S aircraft is being pressed on as quickly as possible, and Coastal Command Tactical Instruction, No. 35 has been re-written. The habit of fighting back may cost us a few more aircraft lost; but if persisted in (which is at least open to doubt) will undoubtedly mean more U-Boats killed. It is up to us to take the fullest advantage of the good opportunities offered before the buzz goes round in the Biscay ports that fighting back is an expensive and unprofitable pastime.

6. Operations against the U-Boat naturally bulk largest in any review of Coastal Command's activities at this stage of the war, but April was also a record month for the torpedo squadrons and their associated Beaufighter squadrons. The war in the Mediterranean is constituting a serious drain on Axis shipping, and this has been accentuated to a very important degree in April by the action of the strike squadrons on the Norwegian and Frisian coasts. Unfortunately, we do not always know, anyway until some time later, whether ships hit have actually sunk or only sustained damage. But 11 ships, amounting to an estimated total of about 50,000 tons were torpedoed in April, of which a large proportion were undoubtedly sunk. In addition, the blockade runner *Himalaya* may have been damaged by a bomb from No. 311 (Czech.) Squadron, using the Mark XIV sight for the first time in action.

These operations against enemy shipping are a really important supplement to the offensive by Bomber and Fighter Commands against the enemy communications on land.

7. The Photographic Reconnaissance squadrons flew a total of 195 sorties (585 hrs. 45 mins.) in April. The Spitfire IV, after doing valuable work in the first line, is now being transferred to training; unfortunately, owing to the demands of the Mediterranean theatre, it has not been possible to provide later marks of Spitfire up to full establishment yet, but this situation will soon improve.

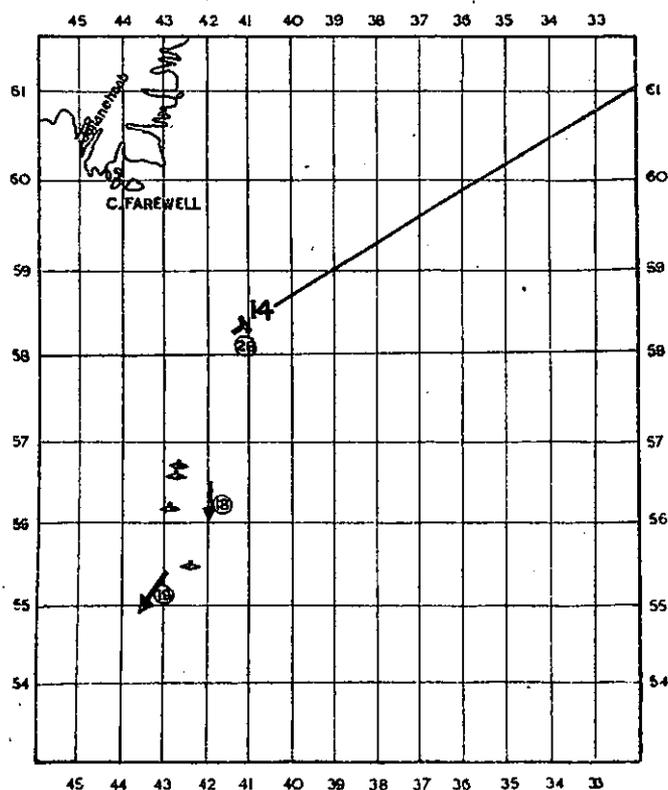
Some specially notable performances were by an aircraft of 540 Squadron which took photographs in the Vienna area for 60 minutes, returning to base with 40 gallons in the tanks; a good damage assessment sortie to Spezia, also by 540 Squadron; an aircraft of 541 Squadron which did ten runs over Berlin, involving 35 minutes over the target, followed by three runs over the Wunsdorf area; and an excellent damage assessment sortie to Stettin also by 541 Squadron, at the end of which the pilot landed at Ludham with dry tanks.

Night photography is making a real advance, and No. 544 Squadron on the night of April 17th, secured good photographs of Cherbourg from 18,000 ft.

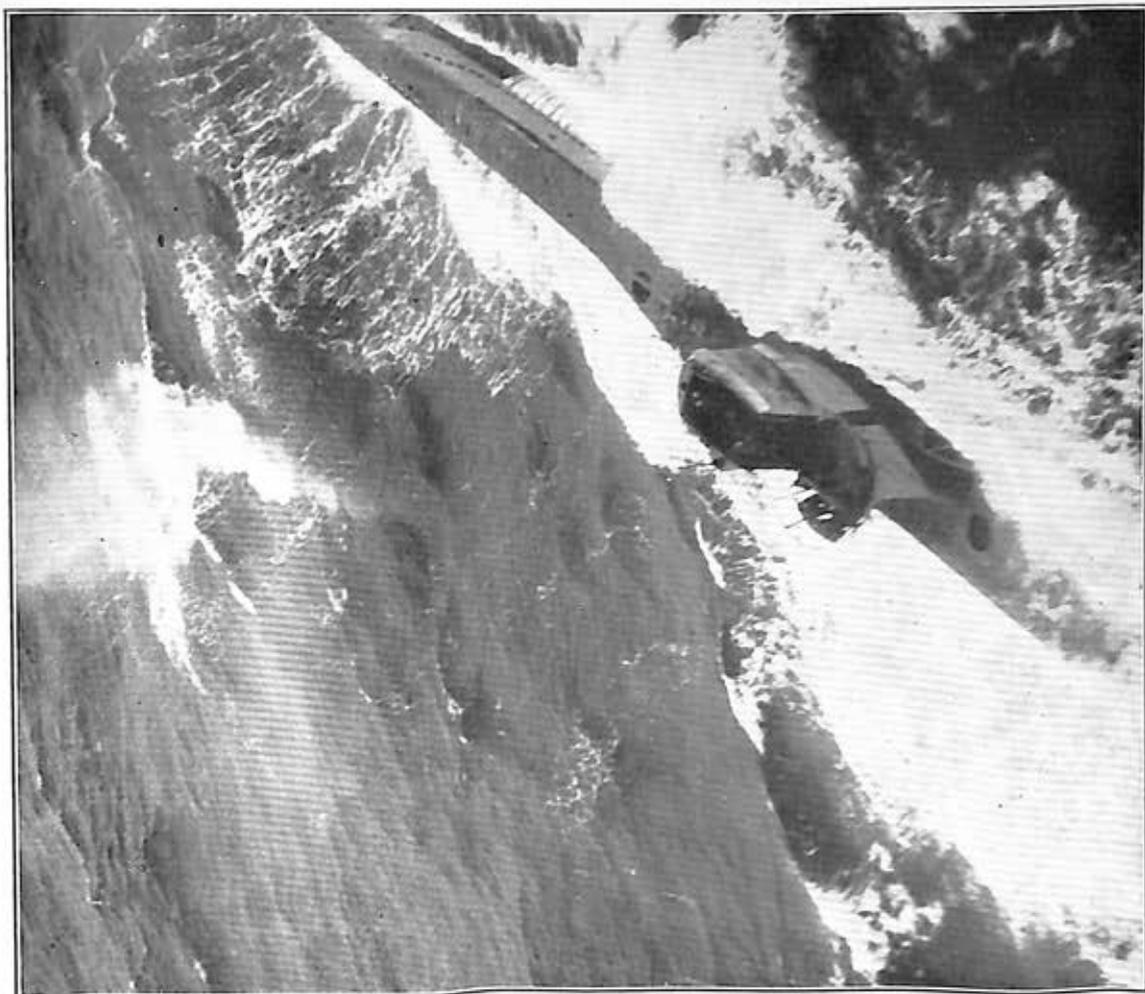
8. The Air-Sea Rescue units and Met. Flights carried on their usual unspectacular but vitally important work. Ninety-eight lives were saved by the former in co-operation with other units, and the latter flew 379 sorties (904 hours) maintaining their tradition of regular performance in all weathers.

9. The excellent results for the month should give solid grounds for satisfaction to an important section of the Command whose work is, perhaps, not sufficiently generally recognized as being of the vital importance that it really is—namely the instructors and ground staffs of the O.T.U.s. Life in an O.T.U. lacks some of the interest and excitement of operations, and it is by no means a rest; it is not intended to be—people don't have rests in war except when they get their well-earned leave. But it is an exacting and highly responsible job. Early in the war we did not recognize the necessity for O.T.U.s. as we now know them; we soon discovered our mistake and now know that they are an absolutely vital component in any Air Force. And everyone in the O.T.U. Group, from the A.O.C. to the newest joined A.C.W.2, can look back on a month like April and reflect that these fine operational results would be impossible were it not for all the hard work they have put in turning out these good crews. 17 Group can also feel that they have an important if indirect share in the credit for the disasters that have befallen the Axis supply lines across the Mediterranean to Tunisia.

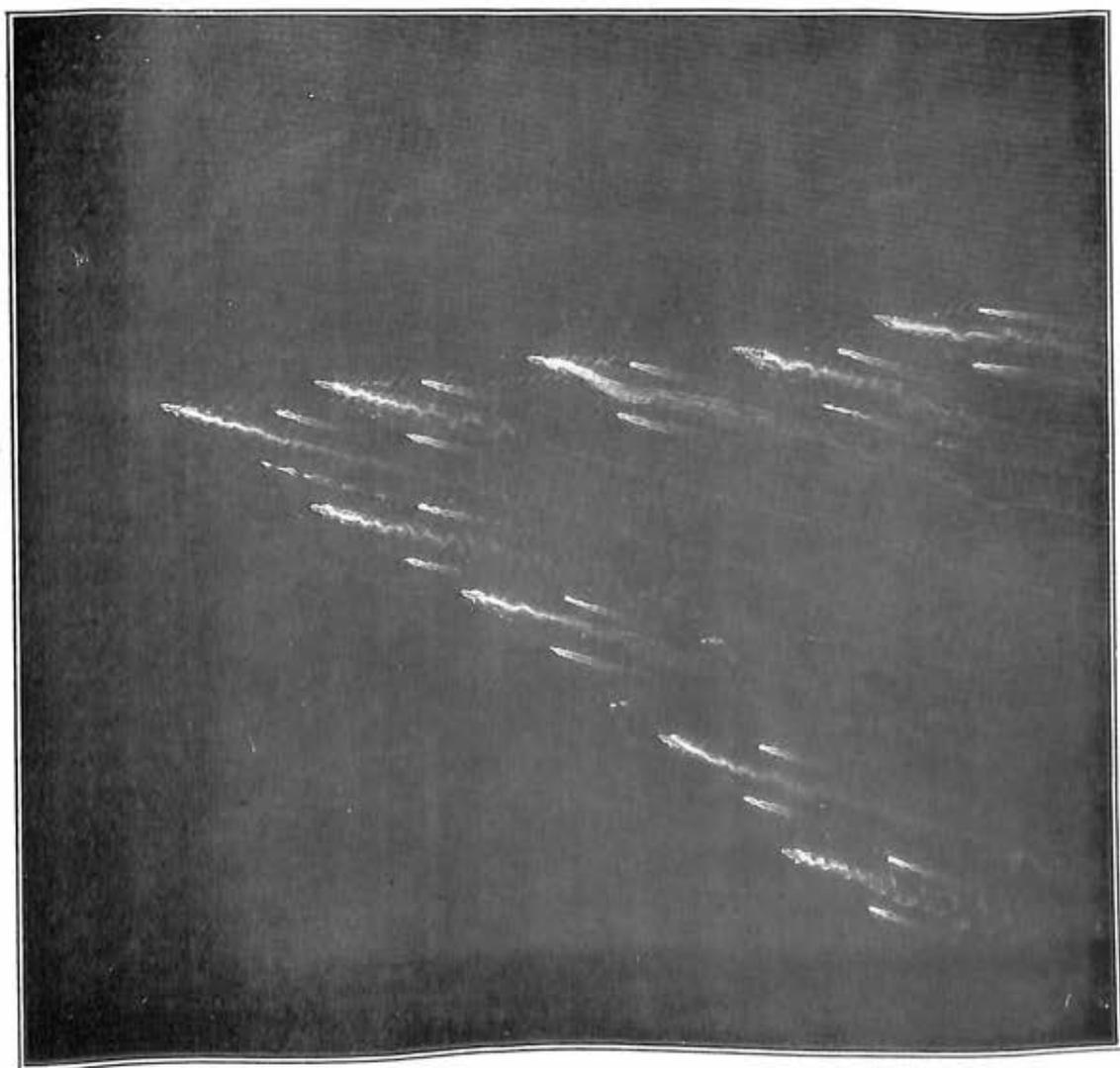
10. The new system of planned maintenance, involving the centralization of responsibility for and control of maintenance on the station is being gradually introduced into the Command. Many of us regret it (we are a conservative race and "new-fangled" schemes are never very popular with us), and the new system admittedly has some disadvantages over the old one under which squadrons, and even flights, looked after all their own maintenance. But the old system has passed—possibly for ever, certainly for the duration of a war in which we have got to make the utmost economical use of every man and woman in the Service. There is no reason why this new system should harm the squadron spirit which is of such real importance in the R.A.F.; we must see that it does not. But in any event we have a wider loyalty; and if the new system is better for the R.A.F., and will mean higher serviceability and more efficiency—as it undoubtedly will when it is in full swing and thoroughly understood by everyone who has to work it—then it is up to all of us to make it a success.



U-Boats Sighted and Attacked by Aircraft from Newfoundland on Convoy Escort. (See p. 1, para. 4.)



A Typical Undershoot.



A Sweep of Nine R-Boats, each with two sweeps out, proceeding at a calculated speed of 12 1/2 knots, was seen off Ijmuiden, sweeping some miles ahead of a south-bound convoy. Taken by 541 Squadron



Attacks by a Hudson and a Whitley, which failed for reasons explained in the letterpress on pages 9 and 10.



Two photographs of a first-class attack by N, 120, referred to in letterpress on page 15

# I.—ANTI-SUBMARINE SECTION

## Anti-Submarine Operations in April, 1943

(See Chart opposite page 4.)

During the month of April there were, in all, 150 sightings of U-Boats leading to 77 D/C attacks by operational aircraft of Coastal Command, 141 sightings leading to 72 attacks came from aircraft based in Gt. Britain or Iceland, and nine sightings leading to five attacks from aircraft based in Gibraltar. A further seven chance sightings were made by odd transit aircraft.

Shipping losses have been low during the month; 23 ships have been sunk in the area shown on the map opposite. Of these only seven were inside 600 miles from Coastal Command bases, and none inside 400 miles. Almost all of these ships were sunk from six convoys.

Of these attacks the first was on the Convoy HX.231. During the night of the 4-5th two ships were sunk in about 57 N. 34 W.—about 600 miles south-west of Reykjavik. Escort was given on the 5th from 1615 to 1920 by two Liberators (one more did not meet), and sweeps round the convoy by six U.S.N. Catalinas—and in all four U-Boats sighted, of which two were attacked. One further ship, however, was sunk just before the air escort arrived. No further ships were lost, though the U-Boats must have kept with the convoy until the afternoon of the 7th, when it was only about 300 miles from Ireland, since five Liberators on escort on the 6th sighted five and attacked four of them, and on the 7th, two Liberators on escort sighted four U-Boats—all attacked—two further sorties by U.S.N. Catalinas did not meet the convoy, and sweeps by four Fortresses from Ireland sighted one more. This operation gives one more example of the fact that in recent months—starting with HX.217 in December—the packs have been following convoys much further in than they used to. Air cover, however, has prevented them getting much results from so doing. The next HX convoy was also picked up and three ships sunk in the night of the 11th-12th, also just over 600 miles from Reykjavik, but air escort by six Liberators from 0910 to 2323 on the 12th, who sighted two U-Boats one of which was attacked, seems to have pushed them off, as no more were seen in spite of three sorties on escorts and eleven on sweeps on the 13th and no more ships torpedoed. Other smaller attacks took place on convoys during the month, and on the 22nd a large scale attack developed on HX.234, a straggler being sunk on the night of 21st-22nd, when the convoy was about 150 miles south-east of Cape Farewell, about 700 miles from Reykjavik. The next day three Liberators were sent to escort, two of which landed on the other side of the Atlantic, and sighted three U-Boats. It is not yet known if they were attacked. On the 23rd, seven more were sighted and two

attacked by four Liberators and a Catalina. One ship was sunk on the night of the 23rd-24th; on the 24th another seven U-Boats were sighted, of which two were attacked with D.C's by three Catalinas. No more U-Boats were seen, and in all only the two ships were sunk.

In the Bay of Biscay the usual escort was given to the convoys running to Africa: on these operations only three U-Boats were sighted (one of which was attacked); but no ships were sunk. The Bay offensive continued to give good results, 52 U-Boats being sighted and 28 attacked (cp. 42 and 24 in March).

Patrols against U-Boats in the Northern passage area have given much higher results, than of recent months, 27 U-Boats being sighted, of which 19 were attacked. No less than 19 of these sightings and 12 of the attacks were in the six days from the 21st to the 26th—a successful series of hunts, involving only 12 sorties, on the 21st and 22nd sighted ten and attacked six.

Analyses of particular attacks will appear in the next issue.

### Sightings and Attacks by Squadrons

(i) U.K. and Iceland	Sighted.	Attacks.
172 S/Light Wellingtons, Chivenor	18	10
407 S/Light Wellingtons, Chivenor	3	2
547 Wellingtons, Chivenor	1	0
10 O.T.U. Whitleys, St. Eval	9	4
58 Halifaxes, St. Eval	5	3
502 Halifaxes, Holmesley S.	1	0
304 Polish Wellingtons, Dale	1	1
311 Czech Wellingtons, Talbenny	1	0
612 Whitleys and Wellingtons, Davidstow.	1	0
10 R.A.A.F. Sunderlands, Mt. Batten.	11	5
461 Sunderlands, Hamworthy	2	1
210 Catalinas, Pembroke Dock	1	1
224 Liberators, Beaulieu	4	3
201 Sunderlands, Castle Archdale	1	0
423 Sunderlands, Castle Archdale	2	2
206 Fortresses, Benbecula	5	3
220 Fortresses, Benbecula	5	3
1,477 Catalinas, Woodhaven	2	2
190 Catalinas, Sullom Voe	10	6
455 Hampdens, Leuchars	1	1
235 Beaufighters, Leuchars	1	0
86 Liberators, Aldergrove	15	9
120 Liberators (Aldergrove and Iceland).	17	6*
84 U.S.N. Catalinas, Iceland	20	7
269 Hudsons, Iceland	4	3
	141	72
Transit a/c	3	0
	144	72

\* Information not yet complete.

## (ii) Gibraltar

	<i>Sighted.</i>	<i>Attacked.</i>
233 Squadron, Hudsons .. ..	6	3
48 Squadron, Hudsons .. ..	1	1
202 Squadron, Catalinas and Sunderlands.	2	1
Transit aircraft .. ..	4	0
	13	5
<b>Grand Total by all aircraft</b>	<b>157</b>	<b>77</b>

**Shipping Protection**

The following table shows the amount of shipping passing through the Coastal Command area and the air protection given to it.

<i>Type of Shipping.</i>	<i>Number of Sailings.</i>	<i>Number protected.</i>
Convoys and Naval Forces .. ..	64	50
Independents .. ..	71	1

This protection was given by 504 sorties, divided as follows:—

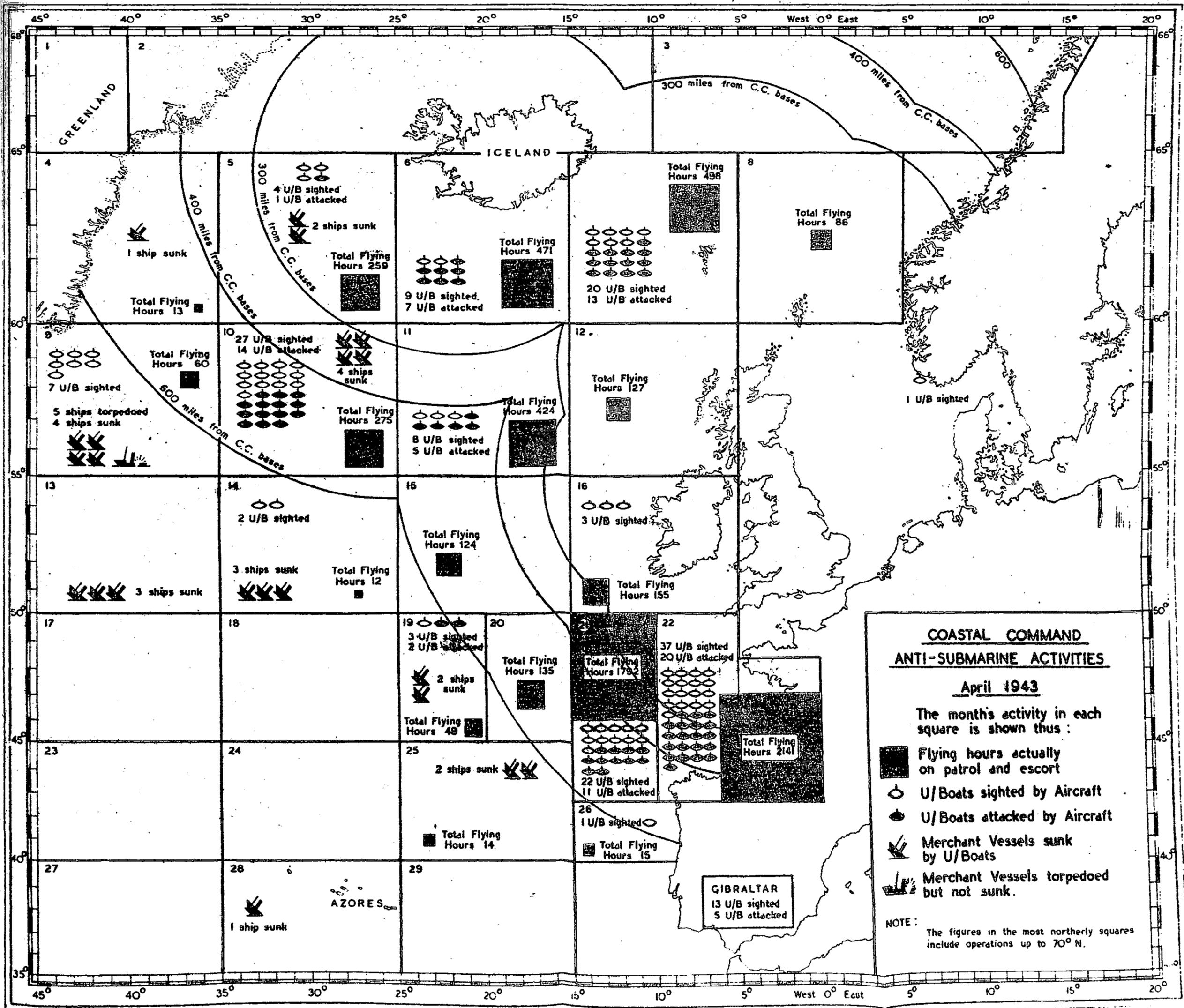
<i>Type of Shipping.</i>	<i>Escorts.</i>		<i>Sweeps round Convoy tracks.</i>
	<i>Met.</i>	<i>Not Met.</i>	
Convoys and Naval Forces ..	241	40	212
Independents .. ..	1	0	

**Analysis of Operations**

The following table analyses U-Boat sightings in terms of the different types of duty engaged in by aircraft (excluding aircraft based in Gibraltar) and the actual duration of the sorties actually on patrol:—

**Offensive Operations**

	All Anti-Submarine Escorts.	Round Convoy tracks.	Bay of Biscay.	Elsewhere.	Chance and non-A/s operations.	C.C. Total on A/S work.
U-Boats sighted .. ..	47	17	52	23	5	139
U-Boats attacked .. ..	20	9	28	15	0	72
Sorties .. ..	282	212	560	162	—	1,216
Arrange no sorties for sighting	6	12	11	7	—	9
Hours actually on patrol ..	908	1,035	3,400	897	—	6,240
Aircraft duration of sorties actually on patrol.	3½ hrs.	5 hrs.	6 hrs.	5½ hrs.	—	5 hrs.



**COASTAL COMMAND  
ANTI-SUBMARINE ACTIVITIES**

**April 1943**

The month's activity in each square is shown thus:

- Flying hours actually on patrol and escort
- U/Boats sighted by Aircraft
- U/Boats attacked by Aircraft
- Merchant Vessels sunk by U/Boats
- Merchant Vessels torpedoed but not sunk.

NOTE: The figures in the most northerly squares include operations up to 70° N.

## Recent Attacks on Submarines

*The following accounts are of attacks on enemy submarines made in March and not assessed in time to be printed in the last number of the Review.*

### "Skilful Loss of Height"

At 1635 hours on March 4, *Hudson III, Z/233*, camouflaged white underneath, was on anti-submarine patrol, flying on track 141°, at 4,300 ft., in weather 3/10 cloud, base 3,000 ft., sea calm and visibility 15 miles when it sighted a U-Boat on the surface, bearing 220°, distant two miles, in position 37° 22' N., 10° 21' W., course 250°, eight knots. The U-Boat was of the German 517 ton type, with duck boards fore and aft and one gun forward of the conning-tower. It was painted medium grey. The conning-tower was oval and squat. The aircraft attacked from the U-Boat's starboard quarter at an angle of 30° to track, releasing from 45 ft., four Mark XI Torpex depth-charges, set to shallow depth, spaced 45 ft. actual, five seconds after the U-Boat had disappeared. Evidence states that the stick straddled the leading edge of the swirl and the explosion was observed as a circular eruption at the end of the wake left by the U-Boat.

After the depth charge scum had dispersed and five minutes after the attack, a large patch of oil appeared with big bubbles in the centre. This oil continued for 24 minutes and spread over an area 300 yards by 50 yards, with a further patch, 100 yards in diameter, which continued to increase. The air bubbles were also seen 1½-2 minutes after the attack. The aircraft had to leave the scene at 1658 hours as P.L.E. had been reached.

### Analysis

*Interval of 5 secs. + 2 secs. time of flight, + 3 secs. to reach depth = 10 secs. During this time the conning-tower advanced 100 ft. ahead of the apex of the swirl. Nos. 3 and 4 of the stick were therefore lethal for plan and depth.*

### Result

*A very good approach with skilful loss of height in such a short distance, followed by an excellent attack. The after results indicate severe damage if not destruction.*

### A Very Good Attack

At 0928 hours on March 7, *Fortress IIA, J/220*, camouflaged white underneath, was on anti-submarine sweep, flying on track 270° at 2,500 ft., just after dawn, in weather 10/10 cloud, base 3,000-1,500 ft., sea rough, visibility five miles, when it sighted a bow wave bearing Red 60°, distant five miles. The aircraft continued on its course, losing height. It then changed course to port to approach the U-Boat which was then 2½ miles distant. The U-Boat was sighted with decks awash, in position 57° 14' N., 26° 30' W., course 260°, 12 knots. A gun was observed forward of the conning-tower. The aircraft attacked from the U-Boat's starboard beam, releasing from 80 ft., seven Mark XI Torpex depth-charges, set to shallow depth, spaced 36-40 ft. apart, about ten seconds after the U-Boat had disappeared. Evidence states that the depth-charges straddled the U-Boat's track,

four being to starboard, one on line of advance, and two to port, about 200 ft. ahead of the swirl. As the last depth-charge plume was subsiding, a dark object, possibly the stern of the U-Boat, appeared near the edge of the depth-charge explosion mark nearest the swirl. This object disappeared after five seconds. About 45 seconds after the attack iridescent oil, apparently diesel, appeared from the centre of the depth-charge explosion mark. There was also thick black treacly oil, not Torpex. The oil spread to an area twice the size of the explosion mark ten minutes after the attack.

The aircraft dropped markers and left the scene for 15 minutes. On returning, nothing further was seen apart from a large number of seagulls. The aircraft remained for five minutes and then, having reached P.L.E., sea markers were dropped and it set course for base.

### Analysis

*Interval 10 seconds + 2 seconds time of flight, + 3 seconds to reach depth = 15 seconds. During this time the conning-tower advanced 150 ft. ahead of the apex of the swirl.*

### Result

*A very good attack. The method of estimating distance by using the explosion mark as a yard-stick is preferred. It is known fairly accurately that as the spray is finally subsiding, the depth-charge explosion mark is 120 yards across. If the edge was about 40 ft. from the apex of the swirl, the stick was about 200-220 ft. ahead of the apex. From the other visual evidence the stick obviously straddled and this puts the explosions across the U-Boat somewhere between the conning-tower and the bow, and after the time interval of 15 seconds, would explode above the hull, so forcing it down and causing the tail to break surface where, in fact, three members of the crew saw an object appear momentarily. The amount of oil seen afterwards in a rough sea indicates extensive damage to the fuel tanks. It is impossible to state with certainty how much the pressure hull was damaged.*

### Escorting SC.122

At 1014 hours on March 19, *Fortress IIA, M/220*, camouflaged white, was on anti-submarine escort to SC.122. It had met the convoy at 0956 hours. While carrying out patrol as ordered by the Senior Naval Officer, flying on track 224° at 5,000 ft., in weather 6/10 cloud, base 1,000 ft., sea calm, visibility 25 miles, a U-Boat was sighted on the surface, 20° on the port bow, 8 miles distant. It was in position 53° 55' N., 23° 51' W., course 330°, 15 knots. This position was 224° 16 miles from SC.122. S/E was switched off. The U-Boat was of the 500-ton type with slatted deck, one gun forward and retracted periscope. A railing was seen around the back.

The aircraft approached to attack from astern but the U-Boat altered course hard to starboard and the final attack was made from the U-Boat's starboard beam. Four Mark XI Torpex depth-charges were released from 50 ft., shallow setting,

spaced 80 ft. actual, from 3 to 5 seconds after the U-Boat disappeared. Evidence states that the depth-charges straddled the U-Boat's track about 100 ft. ahead of the swirl. About 1 minute after the attack, diesel oil began to gush to the surface. Fifteen seconds after, the U-Boat surfaced with decks awash and with no forward movement. The aircraft was too close to release the remaining depth-charges and it had to make a further circuit after which it attacked again, up the U-Boat's track, releasing from 80 ft., three Mark XI Torpex depth-charges, with the same settings. This was just as the conning tower was disappearing. Evidence states that the first depth-charge was seen to fall on the slight swirl left by the conning tower; the remainder falling along the track of the U-Boat. The flow of oil increased considerably until it covered an area about 150-200 yards in diameter. The aircraft remained in the area for 10 minutes and then succeeded in establishing R/T contact with the Senior Naval Officer. The attack was reported. The S.N.O. detailed a corvette to investigate in the position of the attack. The aircraft then continued escort duties.

#### Analysis

*Interval of 4 secs. + 2 secs. time of flight, + 3 secs. to reach depth = 9 secs.*

*During this time the conning tower advanced 90 ft. ahead of the apex of the swirl. Photograph 1628 discloses, that the stick exploded 150 ft. ahead of the apex of the swirl, and No. 1630 confirms a straddle, so that the stick exploded across the U-Boat, between the conning tower and bows, and was lethal for depth. In the second attack the photographs merely show the explosion at the head of an apparent wake (No. 1591). The visual evidence that the first depth-charge fell on the slight conning tower swirl is, therefore taken as accurate. This also should have been lethal for plan and depth.*

#### Result

*A first class attack which brought the U-Boat up in a damaged condition, followed by another accurate attack which should have finished it off.*

#### Successful Surprise Attack

At 0958 hours on March 20, *Sunderland III*, F/423, camouflaged white was covering SC122 and HX229, flying at 5,000 ft., on track 267°, in weather 4/10 cloud, base 3,500 ft., sea calm, visibility 10 miles, when it sighted a U-Boat on the surface, bearing Green 20°, eight miles distant. It was in position 54° 04' N., 21° 57' W., course 180°, 15 knots. The U-Boat was German with guns both before and abaft the conning tower. The aircraft approached from the port bow at 45° to track and observed five men on the upper deck of the U-Boat. The final attack was from the U-Boat's port bow at 45° to track. Five Mark XI Torpex depth-charges were released from 50 ft., set to shallow depth, spaced 36 ft. actual, while the U-Boat was almost fully surfaced. No. 4 did not release. No. 5 appears to have hit the U-Boat; three explosions short, and one just over. This latter gap was much larger than the gap between the others.

Evidence states that the stick straddled the U-Boat which was only partially submerged at the moment of the explosion. Twenty minutes

after the attack, the aircraft left the position and flew along the estimated line of advance. It returned at 1348 hours. Photographs were taken and patrol resumed.

At 1427 hours, when patrolling at 5,000 ft., on track 087°, in similar weather conditions, a U-Boat was sighted on the surface, bearing Red 20°, distant 8 miles, in position 54° 22' N., 19° 50' W., course 225°, 10 knots. As the aircraft approached, fire was opened from cannon at the after end of the conning tower of the U-Boat. The aircraft returned fire and the U-Boat continued firing on the aircraft to within 45 seconds of submerging. The aircraft attacked from the U-Boat's port quarter at 15° to track, releasing one Mark XI Torpex depth-charge from 50 ft., set to shallow depth, while 20 ft. of the stern of the U-Boat was sticking up out of the water at a very steep angle. The other depth-charge failed to release. Evidence states that the one depth-charge exploded within a few feet of the visible stern and within 15 seconds there was a secondary upheaval of water, followed 30 seconds later by a violent eruption of air boiling up, vivid green in colour, 20 ft. across. This was followed by a second boil up, 35-40 ft. across, after a lapse of one minute. There was an oil patch 30 ft. across, close by. Nothing further was observed and after 20 minutes, the aircraft left. It returned in about 30 minutes. P.L.E. had been reached and the aircraft set course for base.

#### Result of First Attack

*A very well executed attack in which the pilot showed great skill in getting down from 5,000 ft. and bringing off a successful surprise attack. This shows that high patrols in suitable weather are successful for flying boats as well as for faster and smaller land types. It is agreed that No. 5 seems to have hit the U-Boat and not exploded. As it is, it seems certain that the five men on the upper-deck were killed and the oil points to damage to the U-Boat.*

#### Result of Second Attack

*This also was a very good attack in the face of flak which was mastered by the aircraft's fire. The one depth-charge which did release appears, by the after results, to have exploded inside damaging range. Serious damage or destruction is possible.*

#### Determined Attack Under Fire

At 1757 hours on March 20, *Sunderland IIA*, T/201, camouflaged white, was on an anti-submarine sweep, covering HX.229 and SC.122. It was flying on track 039° at 3,000 ft., 6/10 cloud, base 3,200 ft., sea moderate and visibility 15 miles, when it sighted a U-Boat trimmed down on the starboard bow, 109°, distant 6 miles, in position 54° 30' N., 24° 50' W., course 320°, 12 knots. The aircraft dived to attack but the U-Boat dived and the periscope had disappeared 80 seconds before the position was reached. A marine marker was dropped and the aircraft circled the position until 1725 hours, but nothing further was seen. The aircraft resumed patrol.

At 1754 hours, while flying at 3,000 ft., on track 089°, a U-Boat was sighted on the surface, bearing Green 20°, distant 6 miles, in position

54° 47' N., 23° 03' W., course 020°, 8 knots. The U-Boat was of the German 500-ton type, with one gun well forward of the conning tower, and a cannon gun at the after end of the bridge. The general colour was grey-green and there was what was apparently an emblem, which looked like an octopus, painted on the side of the conning tower.

The aircraft turned to attack and the U-Boat altered course to reciprocal, presumably to bring its gun to bear on the aircraft. As the aircraft closed, the U-Boat opened fire with the main gun at approximately 800 yards range and with small calibre cannon fire at 400 yards range. Three Very's lights were also fired, amber, red and green. The aircraft returned fire from the front gun, aiming at the crew of three who were manning the U-Boat's main gun. Hits were observed and when possible, the midship's gun opened fire at the conning tower, and finally the tail gun opened fire as the aircraft tracked over. Attack was made from the U-Boat's starboard quarter, at 30° to track, releasing from 30 ft., six Mark XI Torpex depth-charges, set to shallow depth, spaced 60 ft. actual, while the entire U-Boat was visible. At least five men were on the conning tower after release. Evidence states that the stick fell across the bows at an angle of 30° to track, three depth-charges on either side.

The depth-charge explosion spray temporarily obscured the U-Boat, but when it was possible to observe it again, the bow was seen in the air at an angle of about 45°. There was a patch of air bubbles around the bows. The bows appeared to hang there for 3 minutes after which the entire U-Boat slid under the water. The mirror camera was used just prior to the attack and kept on for at least five minutes. The aircraft could not remain longer than five minutes after the U-Boat disappeared owing to P.L.E.

### Result

*A determined and well-executed attack under fire. Photographs disclose that the stick fell just ahead of or across the bows of the U-Boat. They would therefore explode under the fore part of the U-Boat, with No. 3, and possibly No. 2, in damaging range. The subsequent visual evidence points to damage having been inflicted. Casualties were probably inflicted on the crews of the guns.*

### Good Attack by Czechoslovakians

At 1900 hours on March 21, a Czechoslovakian Wellington, Q/311, camouflaged white, was on operation *Enclose* and was flying on track 015° at 5,000 ft., in weather 1/10 cloud, base 15,000 ft. sea moderate, visibility 20-30 miles. It was flying into the glare of the sun when the front gunner sighted the wake of what the second pilot, using binoculars, identified as being caused by a conning-tower on port beam, 5 miles distant, position 47° 22' N., 08° 43' W., course 110°, 8 knots. No details of the U-Boat could be observed. The aircraft turned to port through 100° and dived to attack from the U-Boat's port quarter at an angle of 45° to track, releasing from 50 ft., 6 Mark XI Torpex depth-charges, set to shallow depth, spaced 36 ft., 15 seconds after the U-Boat disappeared. Evidence states that the first depth-charge fell about 150 ft. short

of the U-Boat's line of advance and 50 ft. ahead of the swirl. The remainder fell across track. One minute after the depth charge explosions, an oil patch, 80 yards in diameter and iridescent, formed 400 ft. ahead of the position of the attack. The aircraft remained in the vicinity for 15 minutes but nothing further was seen. Having reached P.L.E., the aircraft set course for base.

### Analysis

*Interval of 15 secs + 2 secs. time of flight, + 3 secs. to reach depth = 20 secs. During this time the conning-tower advanced 200 ft. ahead of the apex of the swirl. Photographs confirm a straddle of the U-Boat's track and the general explosion appears to have been 150-200 ft. ahead of the swirl.*

### Result

*A very good attack. The oil seen afterwards indicates that some damage was inflicted. It is impossible to say how serious the damage may have been.*

### Attack at Night

At 2255 hours on March 21, Searchlight Wellington T/172, camouflaged white, was on anti-submarine patrol. At 2205 hours, the aircraft had obtained S/E contact, 80° to starboard, range 8 miles, and had homed. When flying on track 177° at 200 ft., the searchlight was switched on and it illuminated a U-Boat on the surface, in position 46° 47' N., 07° 30' W., course 257°, 12 knots. Owing to the haze the searchlight was switched off and the U-Boat was lost sight of. The rear gunner fired four or five bursts as the aircraft passed over. It then turned, but contact faded and was not picked up again. At 2255 hours, while flying on track 218° at 1,500 ft., in weather nil cloud, sea moderate, visibility 4-8 miles hazy, S/E contact was obtained 90° to starboard, range 2½ miles. The aircraft homed, losing height and, at 1½ miles at 350 ft., on track 308°, sighted a U-Boat on the surface, slightly to starboard. It was just beginning to crash dive. The searchlight was switched on at 1 mile but it was found to be useless because of the haze. The U-Boat was in position 45° 20' N., 08° 00' W., course 270°, 10-12 knots. It was of the 517-ton type, with gun forward of the conning tower. The aircraft turned slightly to starboard and attacked from the U-Boat's port quarter, at an angle of 30° to track, releasing from 100 ft., 6 Mark XI Torpex depth-charges, set to shallow depth, spaced 50 ft., while the U-Boat was still visible, with its decks awash.

Evidence states that the explosions were estimated to have straddled the U-Boat. When the position came into the vision of the rear gunner, four depth-charges had already exploded, forming one large plume. This was followed by two other explosions and the rear gunner fired five bursts into the plumes. The aircraft circled and made a run over the flame floats, but no after effects were seen other than a large swirl. On the second run over the position of the attack, the conning tower was visible above the water, quite stationary, ahead of the two flame floats. The rear gunner fired three or four bursts at the conning tower. The aircraft circled a third time. The flame floats were still burning and 10 minutes after the attack, a large area of bubbles

was observed where the conning tower had been. At 2311 hours the aircraft resumed patrol.

#### Result

*A very good attack. The after results indicate trouble in the U-Boat, but it is impossible on the evidence to assess how serious this was. It certainly looks as if the U-Boat had attempted to re-surface and had failed.*

#### Another Night Attack

At 0069 hours on March 22, *Searchlight Wellington G/172*, camouflaged white, was on anti-submarine patrol, flying on track 205°, at 1,000 ft., in weather nil cloud, sea moderate, visibility 1-3 miles, when it got an S/E contact 15° to starboard, range 7 miles. The aircraft homed, losing height, and at 1 mile switched on the searchlight and at ½ mile, at 300 ft., on track 190°, sighted a U-Boat in the act of crash diving, in position 46° 47' N., 09° 58' W., course 130°, 10-15 knots. The conning tower and stern were still visible and the U-Boat appeared to be of the 517-ton type, dark grey in colour. The aircraft continued to dive and attacked from the U-Boat's port quarter at an angle of 60° to track, releasing from 70 ft., 6 Mark XI Torpex depth-charges set to shallow depth, spaced almost in salvo due to steep dive. The stern was still visible above the water.

Evidence states that the depth-charges straddled the U-Boat just forward of the apex of the swirl, about 1 or 2 seconds after the conning tower had disappeared. The rear gunner saw one large explosion as the aircraft passed over and, in the trough caused by the explosion, he saw the full length of the U-Boat in the moonlight. The conning tower was not visible and it is thought that the U-Boat had a heavy list. The rear gunner fired a burst of 50 rounds into the swirl. The aircraft made a wide circle to port and 3 minutes later, flew over the flame floats with the searchlight switched on at 250 ft. He sighted two separate patches of very large bubbles. It was not possible to see if these were air or oil bubbles. No part of the U-Boat was visible. The aircraft circled again and dropped a marine marker, but nothing further was seen and no contact obtained. The aircraft remained in the area for 15 minutes and then set course for base.

#### Analysis

*When the depth-charges exploded, the conning tower would have been about 40 ft. ahead of the apex of the swirl.*

#### Result

*A very good attack. If the visual evidence is correct as to position of entry, the explosions should have been within lethal range.*

#### "A Very Fine Follow Up"

At 0959 hours on March 25, *Fortress IIA, L/206*, camouflaged white, was on creeping line ahead search, flying on track 005° at 3,500 ft., in weather 10/10 cloud, base 4,000 ft., with layer of 3/10 at 2,000 ft., sea calm, visibility 7 miles, when it sighted a U-Boat on the surface, 10° on starboard bow, distant 4-5 miles. It was in position 62° 12' N., 16° 40' W., course 240°, 5-6 knots. S/E was switched off. The U-Boat

was of the normal 500-ton type, greenish-grey in colour, with one gun forward of the conning tower. This was clearly seen.

The aircraft made a diving attack from the U-Boat's port bow at an angle of 70° to track, releasing from 200 ft., six Mark XI Torpex depth-charges, set to shallow-depth due to dive approach, spaced less than 100 ft. actual, while the U-Boat was still fully surfaced. Evidence states that the depth-charges entered the water, three on one side and three on the other. The U-Boat was seen still surfaced after the explosions, and it may have been listing to port. The U-Boat then submerged for a few seconds, before the stern re-appeared in a sort of rolling motion, at a very steep angle, estimated at over 45°. The stern hung in this position while the aircraft approached for the second attack. This was made down track, fine on starboard bow, releasing from 50 ft., one Mark XI Torpex depth charge, same settings, just as the stern disappeared below the surface. The time interval between the first and second attacks was 60-90 seconds. Fifteen seconds after the second attack, a disturbance of water was seen in the estimated position of the U-Boat. The placing of the second attack was considered to be very accurate as the depth-charge fell on the spot where the stern had disappeared.

A very large quantity of oil began to accumulate which, by 1040 hours, measured approximately 1,000 yards in length, with yellow and white pieces of debris of various shapes, which came to the surface and remained floating. The debris included what appeared to be logs, surf boards, hatch covers, and one, the largest piece, white and circular, about 10 ft. in diameter. The aircraft dropped flame floats, but the debris was sufficient to mark the position. The aircraft remained in the area for 2 hours 50 minutes. It had then reached P.L.E. and was forced to set course for base. Photographs were taken. By this time the oil was 2,000-2,500 yards in length.

#### Result

*An excellent attack. It is agreed that the results justified the high speed since there are all the indications that this was a kill. A very fine follow up with the remaining depth-charge.*

#### "Severely Shaken Up"

At 0643 hours, on March 26, *Catalina, M/190*, Mark 1B, camouflaged white, was on anti-submarine patrol, flying on track 212° at 350 ft., in weather 10/10 cloud, base 400 ft., sea calm, visibility ½ mile, when it sighted a U-Boat on the surface, bearing Green 58°, distant ¾ mile, in position 70° 10' N., 06° 34' W., course 020°, 2 knots. The U-Boat was believed to be of the 740-ton type, greyish-white, with the conning tower painted dark green. There was one gun on and one aft of the conning tower. The aircraft attacked from the U-Boat's starboard quarter at an angle of 30° to track, releasing from 50 ft., four Mark XI Torpex depth-charges, set to shallow depth, spaced 100 ft. actual, while the U-Boat was still fully surfaced.

During the attack, the U-Boat opened fire, obtaining one direct hit with a 20-mm. explosive shell on the keel of the flying-boat, making a hole big enough to put one's fist in. Evidence states

that the first depth-charge exploded 250 ft. from the U-Boat, three points on starboard quarter; the second depth-charge exploded 150 ft. from the U-Boat, four points abaft starboard beam; the third exploded 50 ft. away, one point on starboard beam; and the fourth, 50 ft. from the U-Boat, one point on starboard bow. The U-Boat then began to submerge and the aircraft immediately made a second attack from the U-Boat's port bow, releasing from 50 ft., two Mark XI Torpex depth-charges, same settings, while the U-Boat was at conning-tower depth.

Evidence states that the first depth-charge exploded 40 ft. from the U-Boat, two points on starboard bow, the second one exploded 140 ft. away, three points forward of starboard beam. The aircraft had previously attacked with 5 machine-gun fire, obtaining hits on the U-Boat. After the second depth-charge attack the aircraft circled the U-Boat to await further opportunities to attack with the machine-gun. The U-Boat then re-surfaced and cruised in a circle at 10 knots. Approximately 10 minutes after the second stick of depth-charges had exploded, another explosion occurred on or close aft of the stern of the U-Boat. This had all the characteristics of an explosion caused by a depth-charge. But it had no apparent effect on the U-Boat which continued on its circular course. Nine minutes later, the aircraft sighted a suspicious swirl, suggesting the presence of another U-Boat surfacing close to the U-Boat which had been attacked. The aircraft investigated the swirl but found nothing. Meanwhile the previous U-Boat submerged normally. The aircraft then sighted an oil streak, bluish in colour, inside the circular track of the U-Boat. The aircraft then left the scene of the attack, returning half an hour later. But nothing further was seen and the aircraft finally left at 0805 hours.

### Result

*Very good look-out and prompt action followed by a good attack, pressed home in a determined manner, in face of flak. Also a very good second attack with the remaining depth-charges. The mushroom of water which appeared 10 minutes after the depth-charge attack cannot be explained but it is thought that the U-Boat was very severely shaken up, with probable minor damage.*

### Severe Damage

At 1930 hours on March 26, Polish Wellington F/304 was on anti-submarine patrol, flying on

track 000° at 2,000 ft., in weather 10/10 cloud, base 2,200 ft., sea calm, visibility 3 miles, when it sighted the wake and immediately afterwards, a U-Boat on the surface, 2 points on port bow, distant 2 miles, in position 46° 19' N., 08° 38' W., course 075°, 10 knots. The U-Boat was battleship grey, but no further details could be observed owing to poor visibility. The U-Boat crash dived immediately after the sighting was made. The aircraft went straight in to attack, losing height in a steep dive, from the U-Boat's starboard quarter, at an angle of 45° to track, releasing from 150 ft., 6 Mark XI Torpex depth-charges, set to shallow depth, spaced 36 ft., 5 seconds after the U-Boat had disappeared.

Evidence states that the depth-charges straddled the U-Boat's line of advance, with the centre of the stick 40 ft. ahead of the centre of the swirl. All the depth-charges were seen to explode. The aircraft made a tight circuit to port over the scene of the attack and 15 seconds after the explosions had subsided, large air bubbles were seen to rise to the surface, followed by oil which spread over an area 100 yards in diameter. This was followed by a considerable amount of apparent pieces of wreckage. There were a number of solid objects, the largest of which was black and approximately 12 by 4 ft.

The aircraft remained over the scene for 11 minutes and nothing further was seen, so it resumed patrol.

### Analysis

*Interval of 5 secs. + 3½ secs. time of flight, + 3 secs. to reach depth = 11½ secs. During this time the conning tower advanced 115 ft. ahead of the apex of the swirl. No photographs were taken to confirm the visual evidence of where the stick dropped or the explosions took place. There is a discrepancy in Section 7 (d) and Section 14 regarding the size of the oil patch. One says that it spread to 300 yards in diameter and the other says 300 ft. No bearing or distance is given of the oil or wreckage in relation to the explosion mark.*

### Result

*A very good attack which on visual evidence appears to have straddled the after part of the U-Boat. The oil and wreckage indicate severe damage at the least.*

## ATTACKS WHICH FAILED

*The following examples of attacks which failed are given for the lessons they teach, with the help of the photographs reproduced at the top of Plate 2.*

A Hudson on anti-submarine patrol, flying on track 088° at 4,300 ft., in weather 10/10 cloud, base 15,000 ft., sea slight, visibility ten miles, sighted a U-Boat on the surface, bearing Red 28°, distant seven miles. It was in position 36° 21' N., 13° 03' W., course 360°, 7-8 knots. The U-Boat was of the typical German 517-ton type, dark in colour, with a gun forward of the conning-tower. The aircraft immediately turned towards the U-Boat on sighting, as it appeared to be remaining on the surface, with guns manned. At approximately two miles, the aircraft altered course 35° to starboard, to circle behind the U-Boat. When within one mile, the U-Boat's gun crew were seen to go below, so the aircraft turned steeply to port and attacked up track,

releasing from 40-50 ft., four Mark XI Torpex depth-charges, set to shallow depth, spaced 45 ft. actual, two seconds after the U-Boat had disappeared.

Evidence states that No. 2 depth-charge fell 15 ft. to starboard of the edge of the swirl. Between 1½ and 2 minutes after the depth-charge explosions, a small patch of oil was seen in the explosion mark, with large air bubbles rising close together, like a "bunch of grapes," a few yards ahead and slightly to starboard of the depth-charge scum. An oil streak ten yards wide, 300-400 yards long, appeared later along the U-Boat's track. The aircraft remained in the area 31 minutes and, at 1813 hours, having reached P.L.E., set course for base.

**Analysis**

*Interval of 2 secs. + 2 secs. time of flight, + 3 secs. to reach depth = 7 secs. During this time the conning-tower advanced 70 ft. ahead of the apex of the swirl. The photographs disclose that the depth-charges fell to port of the swirl mark and measurement reveals that the line error was at least 100 ft.*

**Result**

*Approach was well carried out but it is evident that the aircraft did not track up the U-Boat's line of advance and that the stick, which was correct for range, missed for line by at least 100 ft. to port. This would inflict no damage on the U-Boat though the blast might have forced a little oil out of the external fuel tanks.*

**"Line Error of 250 ft."**

A Whitley was on anti-submarine patrol, flying on track 239° at 2,600 ft., in weather 10/10 cloud, base 2,700 ft., sea moderate, visibility three miles, when it sighted a wake and then a U-Boat on the surface, bearing Green 10°, distant two miles, position 46° 35' N., 15° 03' W. course easterly, speed moderate. The U-Boat was believed to be German, dark in colour, with top of conning tower apparently flush with projections. The pilot immediately made a diving turn to starboard, attacking from the U-Boat's port bow at an angle of 10° to track, releasing from 50 ft., six Mark XI Torpex depth-charges, set to shallow depth, spaced 41-42 ft. actual, between 2 and 3 seconds (estimated) after the conning-tower had disappeared. The rear-gunner states that the depth-charge splashes straddled the swirl, some ahead and slightly to port, at least one inside the swirl near the port

after edge and others astern, and possibly slightly to starboard of the swirl. Depth-charge explosions were also seen which completely obliterated the swirl.

The pilot tracked on, circled and, approximately two minutes after attack, flew back to the scene where the explosion mark was clearly visible, with foam-rimmed edges. Cutting the leading edge of the explosion mark was a smaller patch, estimated one third of the size of the explosion mark. This was observed by several members of the crew. This patch was green, with yellow hues, and a quantity of small bubbles were seen rising in the centre. The aircraft again circled and 1-2 minutes later, the oil patch was still visible, though the explosion mark had disappeared. The bubbles were no longer seen but streaks of black oil were observed within the patch. At 1140 hours, after dropping an aluminium sea marker, the aircraft carried out baiting procedure, returning to the scene of the attack at 1238 hours. Nothing further was seen and at 1250 hours, the aircraft set course on homeward leg of patrol.

**Analysis**

*Interval 3 secs. + 2 secs. time of flight, + 3 secs. to reach depth = 8 secs. The conning-tower would have advanced 80 ft. ahead of the apex of the swirl.*

**Result**

*Attack was made rapidly and range was correct, but photograph No. A.1757 reveals a line error of 250 ft. off the U-Boat's starboard beam. No damage could have been inflicted and the after results must have been due to residue of explosion. The U-Boat would of course have received a shake-up.*

## Trade Protection

### Convoys : SC.122 and HX.229

The history of these two crossings provides a further example of the immediate relief brought by air cover to convoys badly harassed by U-Boat packs. Only one out of the large number of ships attacked in these two convoys was sunk while air cover was present, and at the time concerned the supporting aircraft was busy 10 miles away, attacking another U-Boat.

The routes of the two convoys converged and although their histories overlap at one point, it is proposed to deal with them separately.

#### SC.122

Convoy SC.122 was picked up in position 46° 45' N., 51° 14' W. at 0900 hours on March 12, by B.5 Escort Group, consisting of H.M.S. *Havelock* (S.O.), *Swale*, *Buttercup*, *Saxifrage*, *Pimpernel*, *Godetia* and *Campobello*. The U.S. destroyers *Upshur* and *Ingham* were also in support for some time during the crossing.

The convoy was in 11 columns, reading from 31 to 131.

The voyage was uneventful until 0600 hours on the 16th, when *Campobello* reported that she was leaking badly and had to draw fires. She eventually sank at 1700 hours on the 16th.

#### First Attack

Several bearings had been received during daylight on the 16th, all at a distance, but at 0200 hours on the 17th, a bearing was obtained close ahead of the convoy and a minute later, four ships were torpedoed in quick succession. This may have been a chance encounter, but it was unfortunate for the convoy as this U-Boat was able to home several more, and during the 17th, bearings indicated the presence of at least six within 20 miles of the convoy.

This U-Boat probably dived under the convoy after making the attack as none of the escort picked up a contact.

The convoy was now getting to a position where air cover could be provided, and arrangements were made for a Liberator from Ireland to meet the convoy at dawn on the 17th.

M.86 was airborne at 0001 hours on the 17th and met the convoy after homing approximately 910 miles from base at 0850 hours. This aircraft was able to report to the S.N.O. on arrival that he had attacked a U-Boat at 0822 hours, 10 miles from the convoy on a bearing of 340°.

While carrying out a "Cobra" patrol on the instructions of the S.N.O., another U-Boat was

sighted and attacked at 0935 hours, bearing 020°, 10 miles from the convoy. This attack was reported and after a further "Cobra" patrol at 15 miles, the aircraft left at 1115 hours.

### Second Attack on Convoy

During the interval before the arrival of the next aircraft, a further attack was made on the convoy and another ship was torpedoed. However, when the next aircraft arrived, it was also able to report an attack on a U-Boat bearing 330°, 10 miles from the convoy.

Subsequently in the course of a "Cobra" patrol, another U-Boat periscope was sighted by the same aircraft, on a bearing 090°, 11 miles from the convoy. Unfortunately the two remaining depth-charges failed to release. After reporting to the S.N.O., this aircraft left the convoy at 1615 hours.

Another aircraft was scheduled as escort from 1720 hours to 2145 hours but failed to make contact and was eventually compelled to make a forced landing, after being airborne for over 20½ hours. The crew were uninjured.

### Third Attack on Convoy

At 2214 hours, an attack was made from close in on the starboard bow of the convoy and two more ships were torpedoed. *Pimpernel* saw this U-Boat and gave chase, but contact was lost before an attack could be made.

During the day the weather had been cloudy with wind from the N.W., force 3 to 4, sea slight to moderate, and visibility good.

### March 18

Three Liberators from Ireland and two from Iceland provided almost continuous close escort from 1038 hours until 2038 hours on the 18th.

Although the weather was deteriorating, with the wind from N.N.W., force 4, rough sea and poor visibility, these aircraft made six sightings and were able to get in four attacks on U-Boats at distance between 8 and 22 miles from the convoy.

It was probably due to the efforts of these aircraft, which kept up continuous patrols all day, that the day passed without the convoy being molested.

At 0550 hours on March 19, the convoy was again attacked from the starboard bow, close in, and one more ship was sunk. The U-Boat was attacked by the surface escort and apparently dived under the convoy.

The weather had moderated again, with the wind from N.W., force 4, sea calm to moderate with good visibility.

Air cover arrived in force during the day, three Liberators and three Fortresses being homed on to the convoy and providing close escort from 0734 hours until 0202/20 hours, and five Sunderlands carrying out a parallel track sweep from 0840 hours until 1637 hours. The sweep was arranged to cover both SC.122 and HX.229, which was now sailing on a roughly parallel course 40 to 50 miles to the north.

Six sightings and five attacks on U-Boats were made by these aircraft during the day, one attack being very promising.

One Sunderland was instrumental in saving a tanker from almost certain destruction. The aircraft sighted a periscope at 1045 hours, but was too late to attack it. Shortly afterwards a tanker, straggling from SC.122, was sighted and a warning was passed from the aircraft. Later the tanker was again sighted and also the U-Boat, this time only 6 miles away from it and approaching rapidly. The Sunderland attacked with depth-charges, forcing the U-Boat to dive, and again warned the tanker, giving her a bearing and distance to the convoy.

In the words of the S.N.O., "These aircraft were a tremendous asset to the escort in preventing day shadowers." He also remarked on the good signalling and close co-operation carried out during the day, giving the following example:—

1845/19 A/c called on 2.410 kc/s, asking if there was anything for him. He was remaining until 0200.

1850 A/c told to investigate 287° 10 miles.

1926 A/c reported he had attacked U-Boat 280° 45 miles.

2150 A/c told to investigate contact 224° 5-10 miles.

2236 A/c reported he had investigated and made two contacts which disappeared; also found a straggler bearing 215° 45 miles.

2336 After further bearings in same area a/c told to search again 3-10 miles. A/c reported U-Boat 240° from convoy 9 miles. Attacked by a/c with machine-gun fire, bomb doors failing to open in time.

0142/20 A/c asked for further instructions and told to investigate astern.

0155/20 A/c reported straggler 225° 14 miles, and contact on same bearing 20 miles. A/c then reported leaving.

This example is quoted as showing close escort work at its best.

### March 20

There were still many U-Boats around the convoy and another strong force was sent out on the 20th. Three Fortresses formed the close escort and covered the convoy continuously, from 0715 hours until 2005 hours. In addition, no less than ten Sunderlands carried out a parallel track sweep, covering both SC.122 and HX.229 from 0622 hours until 2005 hours.

The Fortresses carried out patrols round the convoy all day, but they made no sightings. The Sunderlands were more fortunate, making six sightings and getting in four attacks.

In one of these attacks, T.201 caught the U-Boat on the surface, with three men at the gun forward of the conning tower. Six depth-charges were released from 30 ft. while the entire U-Boat was still visible, and the gunners fired a burst at the conning tower. When the spray from the explosions cleared, the bows were seen to rear into the air and hang there for three minutes before the U-Boat slid under the stern first.



In another attack by Z.201, the U-Boat was blown to the surface by the first stick of depth-charges, resurfacing very suddenly at a steep angle. This enabled the aircraft to straddle the conning tower with two more depth-charges.

All these sightings were made in the vicinity of SC.122 which, being the slower convoy, appears to have drawn the pack from HX.229.

### HX.229

Convoy HX.229, homeward bound from North America, consisted originally of 40 ships in 11 columns, with a maximum of four ships in any one column.

B.4 Group, consisting of H.M.S. *Volunteer* (Senior Officer), *Beverley* and *Anemone*, relieved the local Western Escort at 1800 hours on March 14 and had in support, H.M.S. *Mansfield* and H.M.S. *Witherington*. H.M.S. *Highlander* was delayed at St. John's, Newfoundland, with asdic dome trouble and a leak below the fuze magazine and was not able to join HX.229 and take over the duties of S.O. Escort until 1900 hours on March 18, in position 53° 40' N., 27° 38' W., by which time six attacks had been made on the convoy and 11 ships had been torpedoed.

During the morning of March 15, when the convoy was steering 089°, speed 10 knots, a westerly gale sprung up and increased in violence until during the afternoon when the wind was force 9 to 10, with a high sea running and visibility down to half-a-mile.

H.M.S. *Witherington* reported during the afternoon that she was hove to and took no further part in the proceedings. To counteract this, H.M.S. *Pennywort* joined at 1330 hours.

Dawn broke on the 16th with the convoy much scattered but with a distinct improvement in the weather. Course was altered to 028° at 1100 hours, and at noon, the convoy was in position 50° 10' N., 36° 57' W.

Up to this time the voyage was uneventful. But bearings received in H.M.S. *Volunteer* and information from fixes put them on the alert for shadowing U-Boats. At 1342 hours, a close bearing was obtained on 353° and it is probably about this time that the convoy was located.

Drastic alterations of course were made through 118°, 090°, 029° and finally, to 053°, in an attempt to throw off this shadower. But this was without success.

### First and Second Attacks. March 16

At 2215 hours on March 16, the first ship was torpedoed. A search was carried out by the surface escort but nothing was seen. Shortly after they had taken up station again, three more ships were torpedoed in quick succession.

The Master of one of these ships saw the U-Boat close on his starboard quarter just before he was struck. It is probable that this U-Boat passed through the convoy.

In the subsequent search *Anemone* saw a surfaced U-Boat, about 3½ miles astern of the convoy, and attacked it. The results were promising but not conclusive.

### March 21

One Sunderland was detailed for a C.L.A. search, covering SC.122 on March 21, and three Fortresses were sent out to search for wrecks or survivors from the two convoys. Nothing of note was sighted by any of these aircraft.

The convoy arrived in home waters without further incident, on March 24.

### Third and Fourth Attacks. March 17

There were only two ships of the surface escort with the convoy when the third attack was made at 0259 hours on March 17. This was due to the fact that there was no rescue ship with HX.229, and escort vessels were carrying out this work.

Sweeps were carried out on the starboard and port sides, but no contacts were made.

The fourth attack was made at 0456 hours on March 17, probably by the same U-Boat, although there was evidence at this time that there were several in the vicinity. Three ships were torpedoed in these two attacks. *Beverley* picked up an R.D.F. contact about 2½ miles on the starboard beam of the convoy, at 0635 hours, and attacked. No other incident occurred during the night and dawn broke on a sadly depleted convoy.

The weather throughout the night had been fair with wind from the N.N.E., force 3 to 4, visibility 5 to 8 miles. There was a slight swell from the south-west, and a bright moon.

The attacks appear to have been made mostly from the starboard side and one of the U-Boats was seen to be inside the convoy.

The convoy was still out of range of air cover and the outlook at this time was not encouraging, with the probability of more attacks to come from the large pack of U-Boats known to be in the vicinity.

### Fifth Attack

The forenoon passed without incident, but at 1305 hours on March 17, two more ships were torpedoed from the starboard side. Shortly afterwards *Beverley* sighted two U-Boats on the starboard bow of the convoy, at a distance of 8 miles, and made a promising attack on one of them.

The convoy was now getting to a position where air cover could be given at maximum range. Two Liberators from Iceland and one from Ireland were detailed for close escort, from midday till after dusk, on March 17.

Unfortunately, a high wind blowing across both long runways prevented the aircraft from Iceland from taking off, but J/120, from Ireland, was airborne at 1002 hours and began homing procedure at 1635 hours. No bearings were received from the convoy, but a S.E. contact, 30 miles ahead, led to the convoy which was met at 1655 hours, in position 51° 29' N., 32° 51' W., a distance of approximately 980 miles from base. This aircraft provided close escort until 2043 hours and in the words of the S.O. Escort, "a very welcome sight it was."

While with the convoy, J/120 made six sightings of U-Boats and attacked three of them, two with depth-charges and one with machine-gun fire.

The first sighting was made at 1905 hours, from 3,000 ft., the U-Boat being 10 miles on the starboard bow. But while approaching this U-Boat, a second one was observed in a more favourable position for attack, 10 miles on the port bow. The first U-Boat submerged while the aircraft was diving to attack the second.

Five depth-charges were released 8 seconds after the U-Boat submerged, and they appear to have been well placed. Fifty seconds later, the U-Boat re-surfaced, bows first, at a steep angle. After remaining on the surface without appreciable way for a further 30 seconds, she slowly submerged again.

At 1947 hours, J/120 sighted three more U-Boats, about 25 miles on the starboard quarter of the convoy, and attacked the centre one with the last remaining depth-charge and also with machine-gun fire. The result was not observed, but the attack had the effect of causing the three U-Boats to submerge rapidly.

Just after this attack, a sixth U-Boat was sighted, at 1956 hours, and the captain of the aircraft had the satisfaction of obtaining a direct hit with a marine marker, as well as getting in a burst of machine-gun fire before the U-Boat had time to dive.

All these sightings were made at distances of 10 to 15 miles. The fact that the U-Boats were taken by surprise tends to show that they were not expecting aircraft so far out in the Atlantic.

J/120 reported by visual signal to *Volunteer*, at 2005 hours, that there were six U-Boats on a bearing of 180°, at 25 miles. Unfortunately, the S.O. Escort received this signal 5 miles instead of 25, and was consequently more disturbed than he need have been. However, probably due to the efforts of J/120, which left the convoy at 2043 hours, the night passed without incident.

The weather deteriorated on the 18th, the wind going to N.N.W., force 7, visibility dropping to 2 miles, with a rough sea getting up. There were also some snow squalls.

Three Liberators from Ireland and two from Iceland were laid on for escort, but owing to the convoy being re-routed, and the poor visibility, they failed to locate it. However, two sightings were made by N/120 and one by M/120, all in the vicinity of the convoy.

The first sighting was made from 1,700 ft., at a range of  $\frac{1}{2}$  mile, but before the aircraft could get into an attacking position, the swirl was lost in the heavy sea.

The second sighting was made after an S.E. contact, 4 miles ahead, but this conning-tower disappeared immediately and no attack could be made.

The third U-Boat was sighted from 900 ft., at a distance of 3 miles, and was attacked.

The last attack on the convoy was made at 1552 hours on March 18, when there was no air escort present. Two ships were torpedoed on the port side and the U-Boat was observed to pass through the convoy, between the first and second columns. It was attacked with gunfire by several motor vessels and subsequently with depth-charges by H.M.S. *Pennywort*, but the result is not known.

At 1900 hours, H.M.S. *Highlander* joined the convoy, in position 53° 40' N., 27° 38' W., and took over duties as S.O. Escort.

The night was uneventful except that S.S. *Mathew Lukenbach* decided to romp away from the convoy at 1900 hours and was torpedoed at 0954 hours on March 19.

At 0404 hours on the 19th, *Anemone* attacked a U-Boat 4 miles astern of the convoy, and *Highlander* attacked one, 7 $\frac{1}{2}$  miles on the starboard quarter, at 0447 hours. Both these were sightings.

The convoy was now well within range of air cover and the troubles of the sorely harassed surface escort were over. No more attacks were made on the convoy.

Two Liberators and four Fortresses from Ireland and one Liberator from Iceland were laid on for close escort and they covered the convoy from 0805 hours until 2004 hours. All but one of these aircraft were successfully homed on to the convoy.

In addition, five Sunderlands carried out a parallel track sweep, covering HX.229 and S.C.122. Altogether four sightings were made, two well astern of HX.229 and two to the south of S.C.122, which was at this time sailing on a roughly parallel track, approximately 45 miles to the south.

Three attacks were made, one of which appeared very promising.

The weather in the morning had been showery, with a 20 m.p.h. wind from S.S.E. Visibility was 20 miles, with a calm to moderate sea. In the afternoon the wind was N.N.W., 35 m.p.h. The visibility dropped to 4 miles, with a rough sea.

On March 20, three Fortresses were laid on and provided escort to HX.229 from 0548 hours, practically continuously until 2010 hours. They were successfully homed on to the convoy and they patrolled round it all day without making any sightings.

In addition, ten Sunderlands carried out parallel track sweeps, covering HX.229 and SC.122, and made several sightings, all in the vicinity of SC.122.

A sweep was carried out round the convoy by two aircraft on March 21, but no sightings were made. It was now clear that the U-Boat pack had left HX.229 which arrived in home waters without further incident, on March 23.

The following points are worthy of note.

Convoy SC.122 was met approximately 910 miles from base and HX.229 approximately 980 miles from base. The latter, without the use of homing, was a fine achievement.

Altogether, aircraft spent 90 hrs. 54 mins. flying time on actual close escort, and 139 hrs. 20 mins. flying time on sweeps round the two convoys. Thirty-two sightings of U-Boats were made and 21 attacks carried out.

The Admiralty assessments are not yet to hand but two attacks look extremely promising and at least seven others almost certainly inflicted damage of some sort.

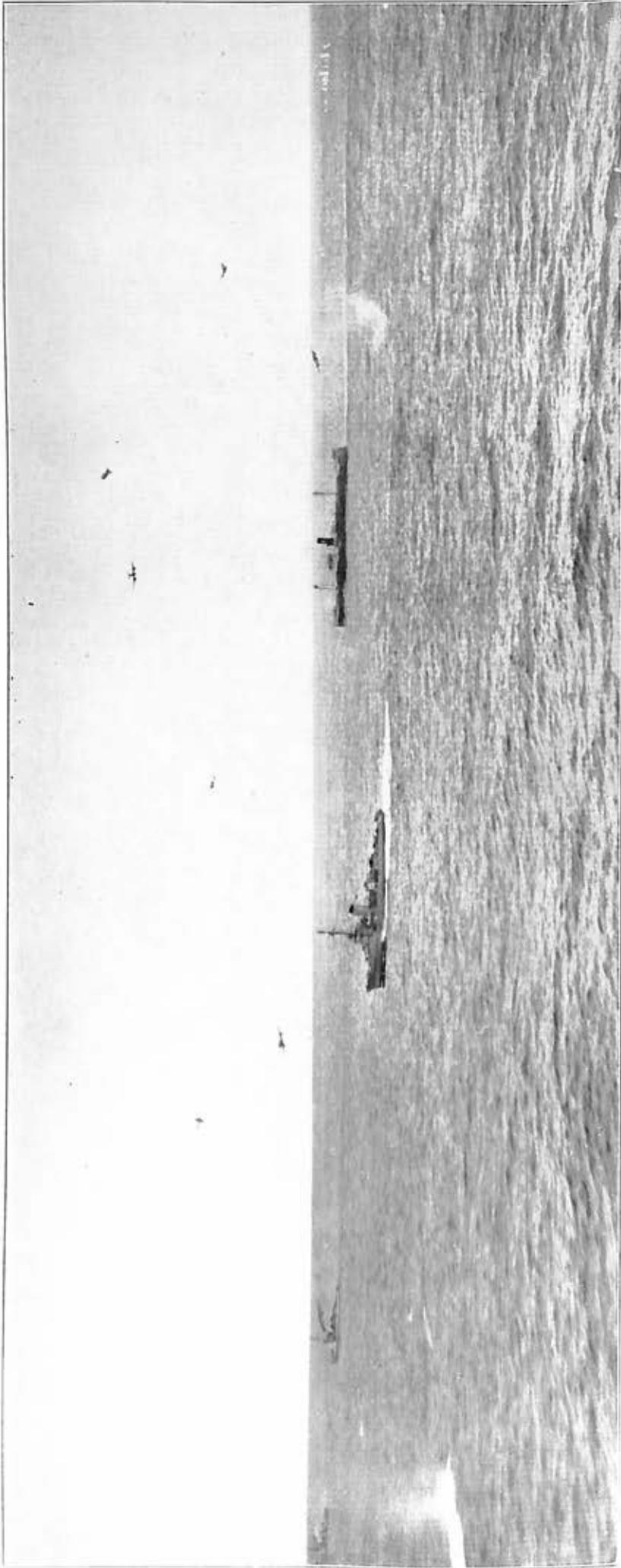
During March 17, H.M.S. *Volunteer*, S.O. Escort in HX.229, received 34 indications of the presence of U-Boats, estimated to be under 30 miles away, but only two of these were recorded in the period of approximately 3 hours, during which J/120 was on close escort. This tends to show that more U-Boats may be put down by aircraft than aircrews may realize.



Incidents during an attack by 143, 236 and 254 Squadrons, off Vlieland, April 29. The convoy, on northerly course, consisted of eight M/V's and eight escorting vessels. The photograph, top left, shows hits on the leading vessel of both columns. The photograph, top right, also shows disposition of convoy.



A photograph of the same action from another aspect, at almost the same moment as the photograph top left. The plumes of water and debris are still standing above the leading ships. A further photograph of the attack appears on Plate 4. (See letterpress page 20.)



Attack on Enemy Convoy by 254 Squadron, April 29. See letterpress page 20, and further photographs of the attack appear on Plate 3.

## The Use of the Form UBAT

Everyone who has made an attack on a U-Boat or who has been the Squadron Commander or Intelligence Officer responsible for the subsequent interrogation, has sighed at some time or other at the voluminous returns required by the staff.

It is felt that it would be of general interest to crews and others to realize the uses to which these returns are put.

On the arrival of the Form UBAT at Headquarters, Coastal Command, it is passed first to the photographic analysis section of O.R.S. The case taken as an example in this article, is an attack by N/120 Squadron, the photographs (see Plate 2), being those available for examination and report.

The method of examination is as follows:—

A plan view of the attack is produced. This plan will definitely place the positions of the exploding depth-charges relative to the U-Boat. However, as the plan is made from the photograph itself, its accuracy depends entirely upon what is shown by the camera. An ingenious set of lenses in a projector reverses the action of the camera and projects the photograph of the attack on the floor, which represents the sea, thus yielding a plan of the attack.

Everything is reproduced, but in small scale: the camera is at height corresponding to that of the aircraft, and all details of the photograph appear as they would to an observer looking vertically at the attack. All perspective and fore-shortening is eliminated, and it only remains to determine the scale. This is done best from a piece of U-Boat, if shown, but alternative yardsticks are available.

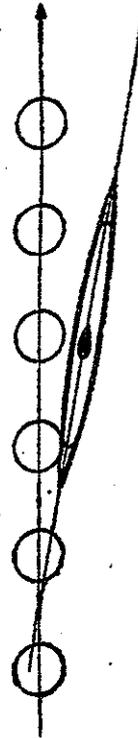
Certain objects must appear on at least one of the photographs in the series to enable analysis to be made. These are the horizon, the swirl or the U-Boat, and the entry or explosion points of at least one depth-charge. Other objects either add to the accuracy of the analysis, or facilitate its production. These are, additional entry points, splashes, domes, plumes in all stages of development, and the wake of the U-Boat.

Obviously everything cannot appear on any one photograph, but some photographs are outstanding for the wealth of data they show. No. 5731 REY. is an example. (Plate 2.) It is particularly favourable to accurate analysis because it shows the entry points of several depth-charges and, best of all, a section of the U-Boat in the same photograph. Because of these, the analysis was both easy to make, and of high accuracy. The pilot is to be congratulated because such photographs result only when special effort is made to fly straight and level after the attack.

As a result of this examination a diagram (see Fig. A on this page), is attached to the Form UBAT and passed to the Naval Staff at Coastal Command. The report is then summarized, a sketch of the attack made (see Fig. B on page 16), and the value of the attack appreciated both by Naval Staff and the S.A.S.O. of the Command.

This appreciation and analysis then go to the assessment Committee of the Director of Anti-Submarine Warfare at the Admiralty, on which Command Representatives sit, when the degree of damage is assessed, based on the evidence obtained in the air and from any other sources available. Copies both of the appreciation and the final assessments are sent both to the Group and Squadron concerned.

FIGURE A



The story of the attack taken as an example, and the appreciation of its possible result are as follows:—(The final Admiralty assessment has yet to be made).

ON A/S ESCORT TO HX.231, while approaching convoy, flying on track  $182^\circ$  at 1,800 ft., in weather 10/10 cloud, base 3,000 ft., sea calm, visibility ten miles with sea haze, sighted U-Boat on surface bearing Green  $60^\circ$ , distant three miles, in position  $58^\circ 20' N.$ ,  $31^\circ 52' W.$ , course  $090^\circ$  6 knots. This position was 015° 10 miles from HX.231. S/E was switched on at time of sighting, but no blip obtained. U-Boat was 517-ton type, light blue colour, resembling duck-egg blue camouflage, jumping wires not seen but visible on photograph 5731, four men were seen in conning-tower. Aircraft turned to starboard and diving out of sun attacked from U-Boat's port bow at angle of  $10^\circ$  to track releasing from 50 ft., six Mark XI Torpex depth-charges, set to shallow depth, spaced 100 ft., while U-Boat was on surface. Engineer, looking through bomb doors, saw a big splash as depth-charges entered the water alongside conning-tower, which was obscured by spray. Aircraft continued on straight course for approx. 30 seconds to allow mirror camera to operate successfully. Rear gunner states that U-Boat was surrounded by flurry of water from depth-charges entering

water and was subsequently obscured by explosion of depth-charges. Aircraft then turned to port and circled scene of attack, which was marked by depth-charge scum and explosion mark. Evidence states that four depth-charges appeared to explode on track ahead of U-Boat and two appeared to explode close to U-Boat's starboard beam. No after effects were observed. Three marine markers were dropped on scene of attack and one on U-Boat's track. Aircraft reported details of attack to S.N.O. by R/T ten minutes after attack, and was informed that destroyer had been sent to scene of attack. Aircraft then proceeded to assistance of convoy and carried out instructions of S.N.O., so was unable to return to scene of attack.

#### Naval Staff

Estimated results of attacks and remarks. (Any criticisms to be read as constructive with a view to assisting pilots in future attacks.)

[Further examples of photographs which are excellent for the data they provide, for analysis, are reproduced on Plate 5.]

Excellent attack in every way, including perfect photographs confirming the visual evidence. One if not two depth-charges are within lethal range and on the photographic evidence indicate serious damage if not destruction.

#### REMARKS BY AIR STAFF, H.Q.C.C.

A very good attack indeed, which, it is to be hoped, resulted in a "kill." The photographs, too, are particularly good and fully confirm visual evidence.

All this may appear a somewhat laborious and complicated procedure, but it is only by this means that a crew can obtain a fair appreciation of the probable result of their attack.

It is also with the aid of information obtained from the forms UBAT, which are now in general use by all forces engaged in U-Boat warfare throughout the world, that new weapons are developed and tactics planned to meet and counter every new move made by the enemy.

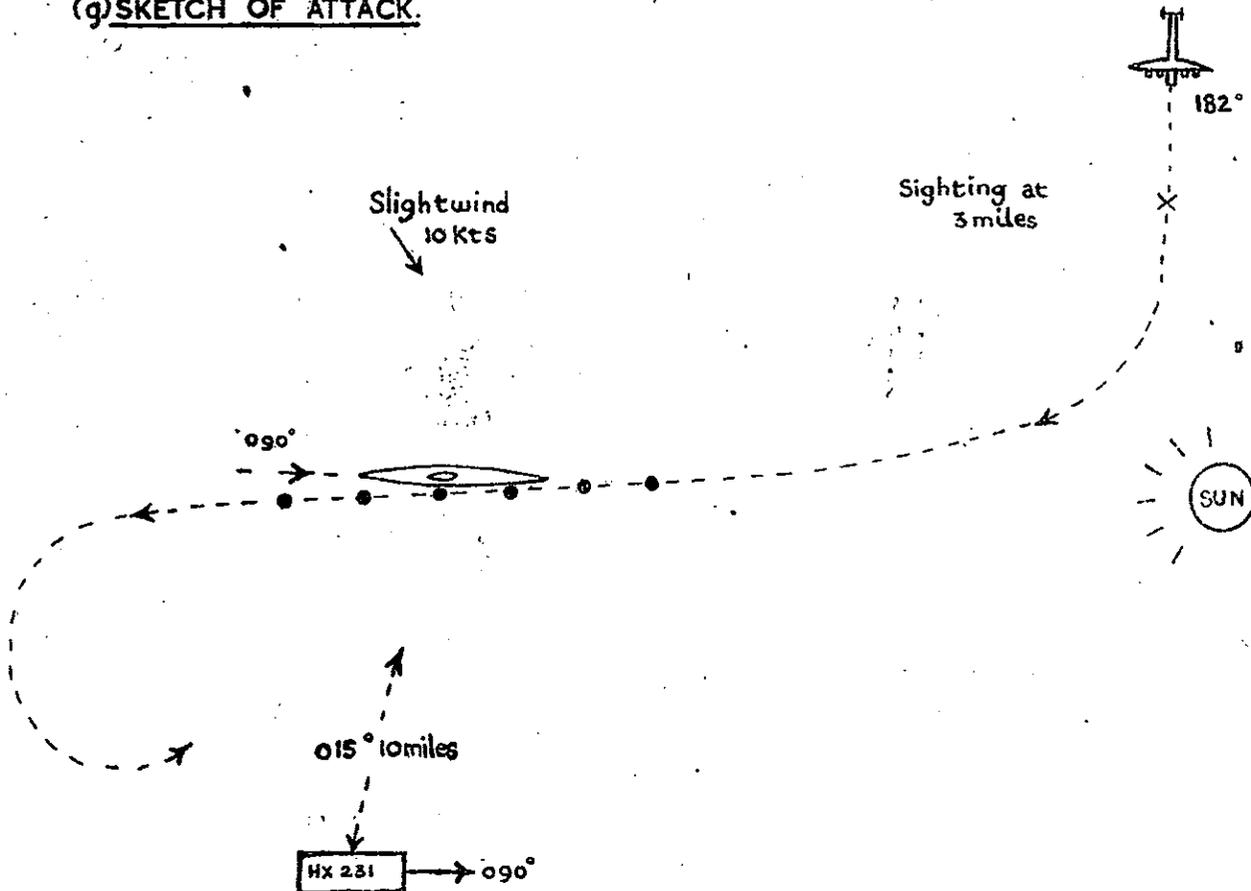
### FIGURE B ANALYSIS OF PHOTOGRAPHS

CAF N/120 =  
FGOFF GL  
HATHIERLY

Aircraft N/120 Date: 5/4/43 Photograph No. 5731/2 Rey.

1. Height of aircraft when 90 yards from explosion = 90 feet.
2. Plan view of weapons and U-Boat at instant of explosion reconstructed to scale from photographs.

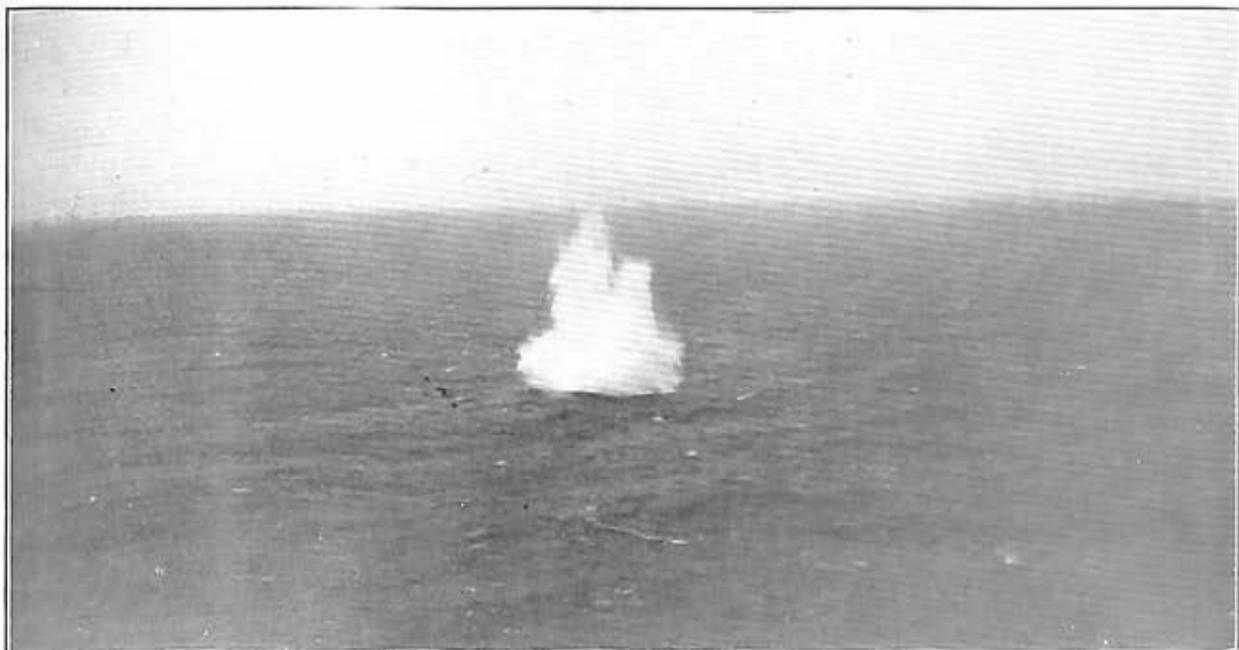
#### (g) SKETCH OF ATTACK.



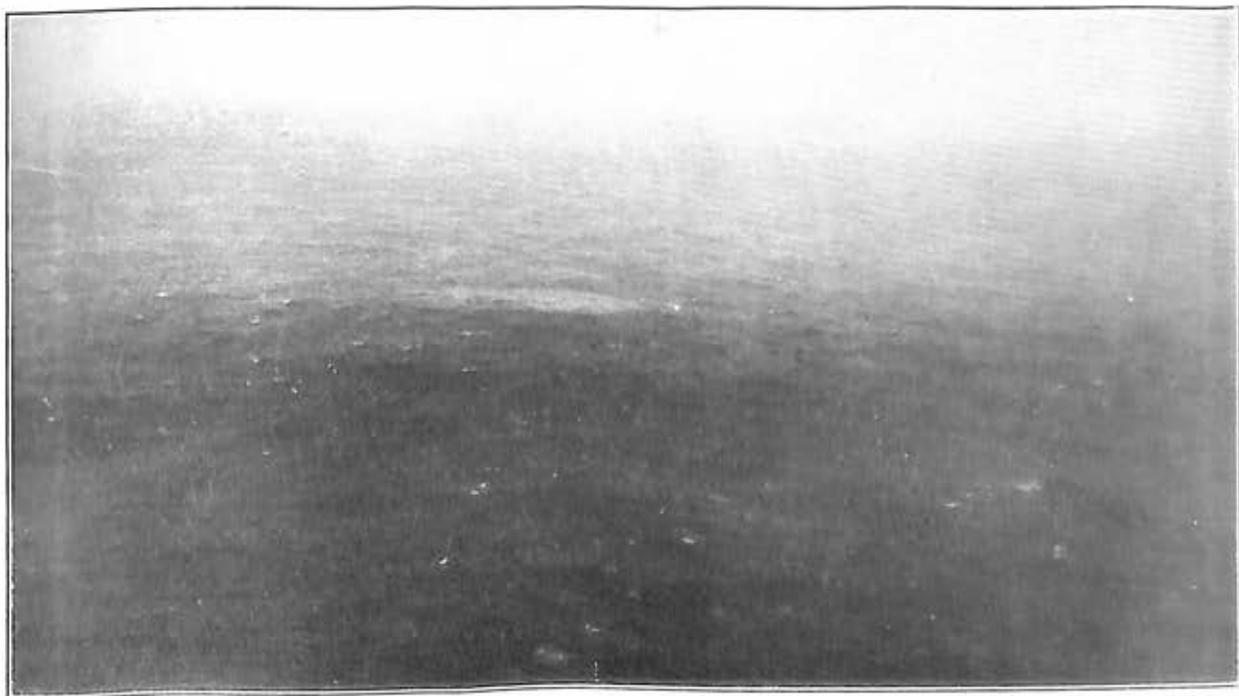
3. Chance of stick being within lethal radius in plan (on photographic evidence only). Most likely.



Attack by S 120. The above was taken four seconds after release of depth-charges.



Photograph of the same attack taken six seconds after.



Photograph of the same attack taken 15 seconds after.



Photograph taken during attack on April 27, by 144 Squadron (Beaufighters), escorted by 404 Squadron. Two torpedo hits are seen, and one probable, in this and the photograph below.



This photograph shows further stages of the explosions.



The vessel, which has been identified as the Norwegian *Frode* (registered 6,800 tons), is here seen after the attack, listing heavily to port and down by the stern. It is now known to have sunk. Details of the operation appear on page 19.

## II.—ANTI-SHIPPING

### Offensive Against Enemy Shipping

The mounting offensive against enemy shipping in the Southern and Northern North Seas, which assumed a sudden crescendo in April, comes at an unfavourable and anxious moment for the enemy ; at a moment when there are many signs of his shortage of the most serviceable types of shipping. A stage has now been reached where lack of merchant ships has probably become a serious and limiting factor to his war effort.

The Royal Air Force has played a considerable part in causing this shortage, with continuous attacks on German and German-controlled ships by Coastal Command, and heavy sea-mining by Bomber Command. These activities have not only caused numerous casualties to ships and crews, but they have also called for a huge negative effort to counter them. The attacks by Fighter and Army Co-operation Commands on rail and water ways have harassed the other arm of the enemy transportation system, and have prevented any switching of seaborne traffic to railways and canals.

To combat these attacks on their shipping, to which the Coastal Forces of the Royal Navy have made an increasing contribution, the Germans have been compelled to draw on their merchant shipping pool for escorts, minesweepers, and auxiliaries. These additional naval craft can be manned only at the expense of the merchant fleet, which is now suffering from a serious shortage of trained personnel ; a shortage which has caused a slowing down of the turn-round time in ports. The result has been a wasteful use of the shrinking amount of shipping that now remains. Our attacks are thus cumulative in the embarrassment they cause.

This shipping shortage has forced the Germans to rely more and more on Swedish ships for the transport of iron ore to Rotterdam ; a commitment which is a weak spot in their shipping organization. Germany is compelled to import large quantities of ores from Sweden each year, and, owing to the brittle state of her railways, has to import them through ports nearest to the Ruhr, namely Rotterdam and Emden. Rather more than half the shipping that carries iron ore westwards from the Kiel Canal is now Swedish. It forms a substantial part of the total that sails along the Elbe-Hook route.

The increasing hazards between Swedish ports and Rotterdam have made Swedish owners and crews more and more reluctant to engage in this traffic and it is probably only because Sweden depends so much on imported coal, usually fetched from Rotterdam, that she has been persuaded to continue the traffic of ore. As a sweetener for the Swedish crews, a danger bonus of 300 per cent. is paid while they are west of the Kiel Canal. The result is that the Elbe-Hook route is now known among them as the "Gold Coast Trade".

If Swedish owners and crews are already unwilling to take part in this traffic, it is clear that a breaking point may be reached, when neither the attraction of coal nor the bonuses

will compensate for the dangers of continuous attacks by the R.A.F. and Royal Navy. It is possible, therefore, that the Swedes might withdraw from these convoys.

It is difficult to envisage completely the effect of such a withdrawal on Germany's economy. It is certain that the enemy has insufficient shipping of his own to carry the iron ore he needs, and that his railways are already too strained to act as alternatives. It is probably no exaggeration to say that such a withdrawal of Swedish shipping would affect the whole of Germany's war economy.

The attacks on enemy shipping sailing along the Norwegian coast affect the enemy differently. There he is faced with the added problem of military supply, for he has to maintain a strong naval force, together with military and air forces, supplying them with many things, including a big and regular supply of oil and petrol, of which every drop has to be carried by sea.

Apart from purely naval targets, tankers are probably the most important in the Norwegian area, although all the big ships are of great value to the enemy. It is estimated that three or even four tanker loads are necessary each month to meet the requirements of Germany's forces in Northern Norway.

Few people realize how much oil is needed merely to keep a fleet at minimum readiness in harbour, let alone send it to sea. A conservative though rough estimate of the amount of oil needed to keep four big warships at six hours readiness, which makes no allowance for a host of auxiliary vessels, puts it at 2,000 tons per month. The consumption rises steeply if readiness becomes more urgent.

It is clear, therefore, that maintenance requirements absorb a big proportion of the cargoes of the three or four tankers that sail northwards each month, and clear also that interference can prevent the building up of reserves, and also delay, or even prevent the sailing of major units on any but the shortest of voyages.

Oil is at present more important to the Germans in Norway than the tankers that carry it, since the enemy possess a surplus of tanker tonnage. Tankers are notoriously difficult to sink, but much harm can be inflicted on their cargoes by mere damage, since fire and sea-water quickly contaminate the oil and may ruin a large part of it, even if the ship is able to proceed to her destination.

These are only two of the soft spots in the enemy shipping system. With the increase of replacement difficulties, and other problems, the position of the enemy deteriorates daily. The anti-shipping activities of the home-based operational commands of the Royal Air Force, together with those of the Royal Navy, are complementary and cumulative in their effect, and if the present crescendo of success continues, it may well develop from embarrassment to disaster for the enemy.

## Torpedo Operations in April

During the month of April anti-ship attacks with torpedoes have achieved a record for this Command, with eleven ships hit by torpedo in fifteen attacks. It is the first month in which Beaufighter squadrons have really been in action against the enemy, with appreciable results. Hampdens have been equally successful in their attacks.

The North Coates Wing, after a period of inactivity due to training and equipping, carried out two well-executed attacks on heavily escorted enemy convoys off the Dutch coast, hitting three ships, of which two seem likely to have sunk and damaging a number of escort vessels with bombs and cannon. In the meantime, 18 Group, operating smaller formations, have made eight attacks, obtaining hits on five ships of which three seem likely to have sunk.

The success of these attacks is due to excellent T.T.U. and squadron training and to the firm intention with which crews pressed home their attacks to the close range necessary for securing decisive results. In some cases, also, it has been due to the excellent work of Beaufighter-bombers and Cannon aircraft which, by attacking escorting Flak ships from close range, have destroyed the gun positions and enabled the Torpedo aircraft to make their attacks almost unchallenged.

The timing and co-ordination between the three North Coates squadrons was undoubtedly well carried out and it reflects great credit on all concerned. The photographs taken by the Torpedo aircraft show that all the torpedoes must have been running before a hit was made, which proves that the timing of the drops was excellent. The aircraft of 143 and 236, whose duty it was to keep down the flak, did their part extremely well, which is borne out by the fact that very little flak was met during the attack. The Torpedo aircraft were undamaged and only two aircraft were damaged in the other two Squadrons.

The North Coates Beaufighter Wing consists of No. 254 Squadron (Beaufighter torpedo aircraft), No. 236 Squadron (Beaufighter Fighters, also carrying two 250-lb. bombs), and No. 143 Squadron (Beaufighters). Single-seater Fighter escort has been provided by aircraft operating from Coltishall, 12 Group, Fighter Command, and Army Co-operation aircraft.

The North Coates Wing was formed towards the end of 1942 to deal with the enemy's Dutch Coast convoys, which are well protected by numerous escort vessels and flak ships, within

easy reach of single-seater fighter protection. The duty of the Wing was to overcome the flak defences by a concentration of numbers of aircraft and by co-ordinated cannon and bomb attacks, so as to give the Torpedo aircraft the maximum chance of getting their torpedoes in at close range, without excessive flak interference. Fighter escort was also given to prevent the interception of the less manoeuvrable Beaufighters by enemy single-seater fighters.

The Wing first operated in November, 1942, in bad weather conditions which made it impossible to pick up the fighter escort, causing half the Beaufighters to lose the formation. The strike was consequently a somewhat costly failure. Since then the squadrons have carried out intense training in formation flying, synchronized horizontal attacks, range estimation and V.H.F. inter-communication, together with the picking up of fighter escort. This occupied some time, as 143 Squadron had to be re-equipped with Beaufighter XI's from their old Beaufighter II's and 254 Squadron also had to receive new aircraft.

This training was not in vain. On April 18, the Wing, consisting of nine Torpedo aircraft, six Beaufighter bombers and six Beaufighters, struck a well-escorted convoy and probably sank the *Hoegh Carrier* of 4,906 tons, without the loss of a single aircraft or injury to a single crew. Again, on April 29th, twelve Torpedo aircraft, nine Beaufighter bombers and six Beaufighters struck an even better protected convoy and scored torpedo hits on each of the two largest M.V.'s for the loss of one Beaufighter.

The success of these operations was due to careful briefing, good leadership, saturation of the enemy defences, and the close range of drop achieved by the torpedo aircraft. The fighter escort, although it had no opposition (on each occasion a single Ju.88 over the convoy fled, in the words of the pilots, "at phenomenal speed") was greatly appreciated. The close escort of Mustangs were "like sheep dogs," according to pilots, whose praise of their "personal escort" was unbounded.

The Spitfires too gave our pilots a feeling of security, accustomed as they usually are to meeting the enemy's single-seater fighters with only cloud cover and their own evasive action to protect them. The close liaison between the Beaufighter Wing and No. 12 Group Wing at Coltishall was an outstanding success and a stimulating influence on the morale of our pilots. Against such numbers of flak-ship destroyers and with such first-class fighter cover, the German convoys will inevitably learn to fear the North Coates Wing.

## Details of Operations

**Aircraft W of No. 235 Beaufighter Squadron** on a shipping reconnaissance off the Norwegian Coast sighted a He.138, flying on a reciprocal course. Aircraft W turned to starboard and carried out a full starboard beam attack on the enemy aircraft, opening fire with cannon and machine-gun from 500 yards, closing to 200 yards. The enemy aircraft replied with inaccurate fire from the front turret. Aircraft W broke away to port and, continuing the steep turn to port, closed

astern of the enemy aircraft, which took no evasive action other than to lose height to sea level. When at 500 yards aircraft W opened fire, closing to 100 yards. The starboard engine of the enemy aircraft then caught fire. Aircraft W then began the third and final attack from astern, closing to 100 yards. Hits were registered along the mainplane and there was no return fire from the enemy aircraft, which hit the water as aircraft W broke away from the attack. One survivor

was seen clinging to the edge of the port wing, which was slightly submerged in a grey patch of oil.

Six Beaufighters Z, K, Y, H, T and X of No. 235 Squadron were escorting three Hampdens, L, D, and R, of No. 455 Squadron on a shipping reconnaissance off the Norwegian Coast when a fully surfaced 517-ton U-Boat was sighted, escorted by a 500-ton flakship. The flakship opened fire on the Hampdens, who were flying in loose Vic. formation. The rear gunners of L and R/455 replied with machine-gun fire, but they were unable to see the results of their fire. Beaufighter Y/235 then carried out a port beam attack on the U-Boat with cannon and machine-guns, opening fire at 600 yards, closing to point-blank range. Hits were observed on the conning tower and return fire from the U-Boat ceased when aircraft Y/235 closed to about 200 yards range.

Further attacks were made on the U-Boat by aircraft Z, K, T and X/235. The U-Boat eventually submerged. The escort vessel was also attacked. It altered course towards the land with flames and smoke coming from between the funnel and the stern.

X/235 sighted a single-engine fighter, which climbed into cloud and then carried out an astern attack on X/235 from extreme range. X evaded further attacks by making use of the available cloud cover. The Hampdens meanwhile continued their patrol, escorted by H/235.

P, N and X, of 489 (R.N.Z.A.F.) Hampden Squadron, on Rover patrol off the Norwegian coast, sighted a motor vessel of 7,000 to 8,000 tons, escorted by one trawler type escort vessel. All three aircraft approached the target from ahead, low on the water inshore of the target, flying in line abreast.

The aircraft turned in to starboard in quick succession and attacked the merchant vessel in turn from positions just ahead and abaft the beam. Complete surprise was achieved and no flak was met until the completion of the attack. The Hampdens dropped their torpedoes from approximately 600 yards and scored one definite hit, estimating two more probable hits.

When last seen the target was listing 15 degrees to starboard, down by the bow, and heading for the shore. (See Plate 9.)

Beaufighters U, G, E and C, of 144 Squadron set course on a Norwegian Coast Rover patrol and sighted a 3,000-ton merchant vessel, a 1,500-ton merchant vessel and three escort vessels at a range of about 3 miles. They attacked simultaneously from the starboard beam, U leading and C being slightly behind and attacking the smaller merchant vessel.

The escort vessels concentrated their fire on U and scored hits on her. The pilot was severely wounded, but he continued and dropped his torpedo. G and E followed in, getting less flak and securing at least one torpedo hit. The ship was seen to blow up. The Navigator of G/144 claims that he saw the 1,500-ton merchant vessel also blow up.

3. Hampdens P, X, T and K, of 489 (R.N.Z.A.F.) Squadron, on Rover patrol off the Norwegian coast, sighted two Arado 196's Fighters and

shortly afterwards saw the convoy they were escorting. This consisted of a 6,500-ton tanker, a 5,000-ton merchant vessel and an escort vessel. Aircraft were engaged by the Arado and K was seen to be in difficulties with one engine smoking. This aircraft was not seen again. Despite this the remaining three aircraft pressed home their attack, X being engaged throughout by an Arado. P dropped at the tanker at 1,000 yards and scored a hit, a column of black smoke enveloping the tanker, which was later seen to blow up. X and T attacked the merchant vessel and T was seen to be hit by flak and to dive into the sea out of control. The pilot of P saw a white splash on the stern of the escort vessel, which may have been X's torpedo (released at long range, due to engagement with Arado). (See Plate 9.)

Hampdens X, J, L and R, of No. 489 Squadron, took off, carrying one torpedo each, on a Rover Patrol off the Norwegian coast. They were escorted by four Beaufighters on flak diversion duties. The weather conditions were fair at first, but near the target area they rapidly deteriorated, with cloud 10/10ths at 600 ft., and visibility was down to one to two miles, in drizzle. The Beaufighter escort was unable to maintain contact with the slower Hampden aircraft in such poor circumstances and they were forced to return to base.

Ten minutes after the departure of the Beaufighters, the Hampdens sighted a convoy of three escort vessels and two V.M.'s of, 3,000 and 2,500 tons respectively. They were bearing 090°, distance 2 miles on a course of 360°, speed 5 knots. The leader in aircraft L, followed by J, turned in to attack the second V.M. Aircraft X attacked the other V.M. of 2,500 tons. Aircraft R was on the starboard of the formation and was unable to get into a suitable dropping position. The attack was carried out through fairly intense heavy and light flak. The get-away was made by turning to starboard, after dropping the torpedoes and passing out to the rear of the convoy, using the normal evasive action from the leading DD and the 3,000-ton V.M. One M/V was definitely hit and rear gunner estimated a possible hit on the second M/V.

Hampden B/415, on moonlight Rover, sighted a convoy off the Dutch coast and attacked with a torpedo from 600 yards, achieving surprise, as no flak was experienced until after attack. The target, a merchant vessel estimated at 6,000 tons, was seen by both gunners after the attack to be covered in thick smoke.

#### Shipping Strike off Norwegian Coast

Further blows were struck at enemy shipping on the afternoon of April 27, 1943, off the Norwegian coast by four torpedo Beaufighters, B, S, R and N, of No. 144 Torpedo Beaufighter Squadron, escorted by six Beaufighters, A, B, F, G, S and Q, of No. 404 Canadian Beaufighter Squadron. (See Plate 6.)

At 1445 hours, approximately 3 miles south-east of the Naze, one merchant vessel and two escort vessels were sighted on a south-easterly course. A/404 attacked the port escort vessel on the port beam from the landward side with cannon and obtained hits on the bridge. B/404 attacked the same escort vessel from the port quarter, while Q 404 attacked from the starboard

beam. F/404 attacked the starboard escort vessel from the starboard quarter, G/404 attacked from astern, as did also S/404. Generally the flak was not intense, but F/404 reported that there appeared to be fire from at least four guns of the 37mm. type from the escort vessel attacked.

Aircraft B and N of No. 144 Torpedo Squadron attacked the merchant vessel on the port bow from the landward side, while aircraft R and S of 144 Squadron attacked on the starboard bow from the seaward side. The torpedo aircraft then strafed the escort vessel as they broke away from the attack.

Three torpedo hits were estimated. These were confirmed by excellent photographs and by crews of the accompanying aircraft. The merchant vessel was left enveloped in smoke and steam and listing heavily to port. Not one aircraft was lost from this perfectly co-ordinated attack, although two Beaufighters were damaged.

#### Attack off the Dutch Coast

Late in the afternoon of April 29, 1943, the No. 16 Group Beaufighter Wing, consisting of 12 torpedo Beaufighters of No. 254 Squadron, nine flak-destroying aircraft of No. 236 Beaufighter Squadron armed with two 250-lb. G.P. bombs, three-second delay, cannon and machine-gun, and six flak-destroying aircraft of No. 143 Beaufighter Squadron armed with cannon and machine-gun, together with a fighter escort of Spitfires and Mustangs of Fighter and Army Co-operation Commands, carried out another skilful and successful attack against an enemy convoy off the Dutch Coast.

#### Shipping Attack

A successful attack on an enemy convoy off Texel was made by the No. 16 Group Beaufighter Wing on the afternoon of April 18. Nine Torpedo-carrying Beaufighters of No. 254 Squadron, six Beaufighters of No. 236 Squadron, carrying two 250-lb. 3-second delay bombs, cannon and machine guns, and six Beaufighters of No. 143 Squadron with cannon and machine guns. The above Wing was escorted by two squadrons of Spitfires as top cover, one squadron of Typhoons, rear cover, and eight Mustangs, close support, of Fighter Command. This north-bound convoy consisted of nine merchant vessels escorted by four M class minesweepers, and two trawler-type E/V. The merchant vessels were disposed in two columns, each led by a minesweeper, the remaining two minesweepers being on either wing. With the exception of the *Hoegh Carrier*, a merchant vessel of 4,906 tons, the merchant vessels were approximately 2,000 to 2,500 tons. All were flying balloons.

#### Far Eastern Blockade Running

"If you can run the Blockade, it will be the same as winning a big battle for the Fuehrer," said a German captain to his crew before sailing from the Far East. The Chart opposite shows the results of the battles in the enemy blockade running campaign of the Autumn and Winter, 1942-43, following an inactive period in the summer.

The enemy was able to win almost all the early battles, but once the United Nations had correctly estimated their task and perfected their tactics, they won all but one of the later ones. Coastal Command was intimately connected with the measures, which were truly on an

The convoy consisted of six merchant vessels and nine escort vessels. Three minesweepers in line abreast were leading the convoy, followed by the merchant vessels, in two lines astern, consisting of port line two 4,000- to 5,000-ton merchant vessels (main target) and a smaller merchant vessel. The starboard line had a 2,000 to 3,000-ton merchant vessel, followed by two smaller merchant vessels. Two escort vessels were abeam of the leading merchant vessels, one to port and one to starboard. Two escort vessels were abeam of the rearmost merchant vessels and two trawler escorts astern. Five balloons were flying in the centre of the convoy, about 800 to 1,000 ft.

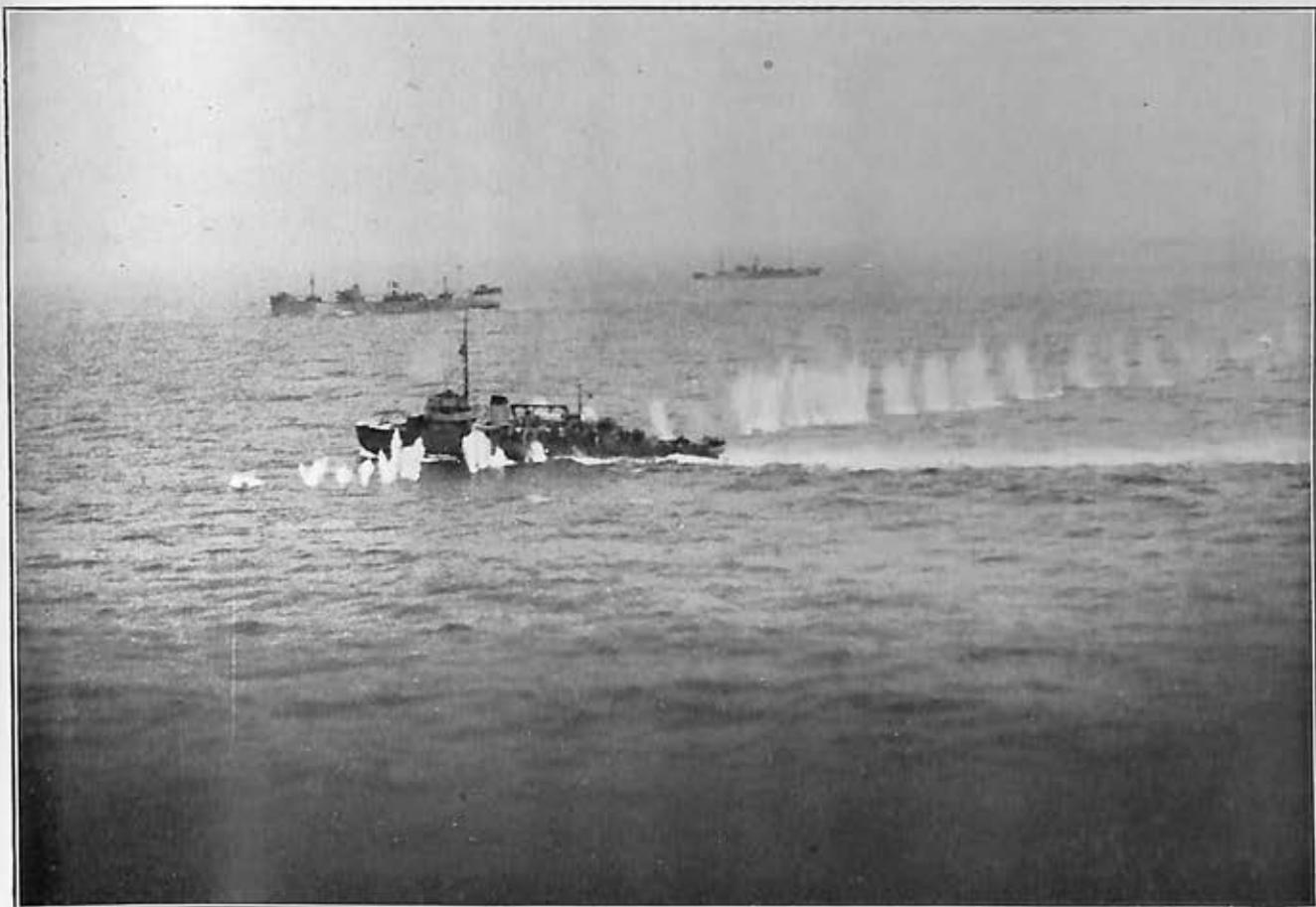
The disposition of the escorts made the target more formidable than the one previously attacked. Also, owing to an alteration in speed by the enemy convoy during the period of the last reconnaissance to the estimated time of attack, the all-important element of surprise was lost. However, through skilful leading, the attacking "balbo" was brought into position and the attack was pressed home with skill and precision, with the result that the main target merchant vessels received torpedo hits and several of the escort vessels received much damage, one by a direct hit from a 250-lb. bomb and the remainder from bomb blast and cannon and machine-gun fire. Excellent photographs and reports of the crews confirmed the damage. Although the flak was severe and one or two aircraft received minor damage, only one of our aircraft was lost. (See Plates 3 and 4.)

#### off Dutch Coast

The convoy was apparently taken by surprise and the first section of aircraft to attack encountered only moderate heavy and light flak. The *Hoegh Carrier* received at least two torpedo hits and the last photographs taken show it enveloped in smoke and with a heavy list to port. The minesweepers at least were heavily damaged, one receiving a direct hit by a 250-lb. bomb. The remaining escort vessels were damaged by cannon and machine-gun fire. Gun crews on some of the escort vessels were seen leaping overboard, and there is no doubt that many of the gun crews were killed and many more wounded. Excellent photographs were obtained during the attack, which showed increasing damage as the action progressed. Only two aircraft received the slightest damage, thus showing that the defences were completely overwhelmed by this well co-ordinated attack. (See Plates 7 and 8.)

international scale, since enemy ships were sunk by the British, Americans, French and even the Germans themselves, in error.

The Chart shows that some 28,000 tons of goods were landed in German Europe between June, 1942 and mid-April, 1943. It also shows that twice this amount was lost. These figures justify the Allies in claiming a resounding victory. The campaign may be entering a period of reduced activity, but it is not over. It is to be hoped that the experience gained will enable the remaining battles to be settled as decisively as those of the first four months of 1943.



The photographs on this plate and on plate 8, illustrate the attack made by 143, 236 and 254 (Beaufighter) Squadrons, on an escorted convoy off Texel (see letterpress, page 20) on April 18. The above shows an "M" class minesweeper under cannon fire.

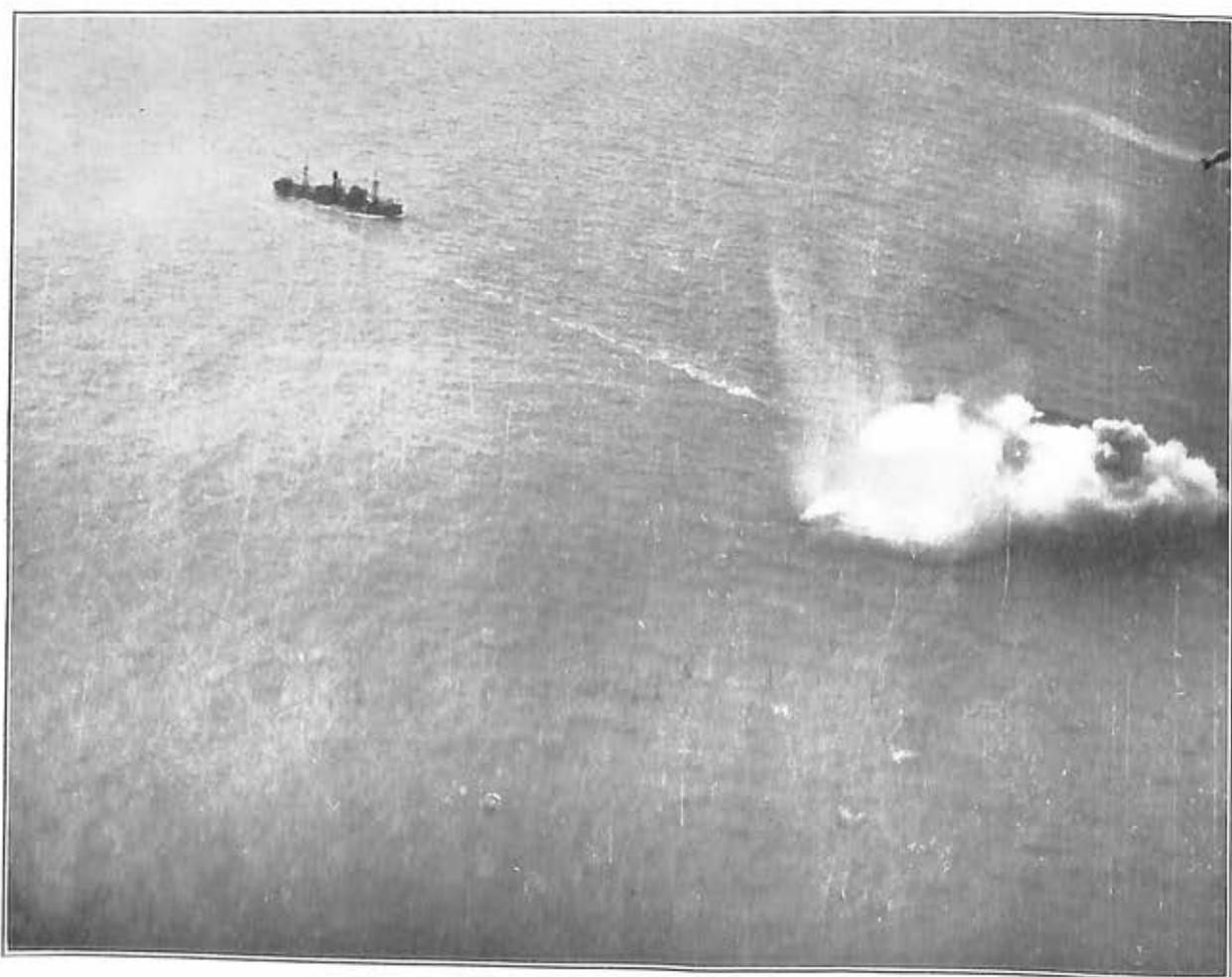


This photograph, taken after the principal ship of the convoy had been hit by a torpedo, clearly shows the disposition of the ships. Balloons are flying and in the foreground are the sweeps from the "M" class minesweeper which was leading the column.

PLATE 8



A Beaufighter attacking the same minesweeper as in the top photograph on Plate 7.

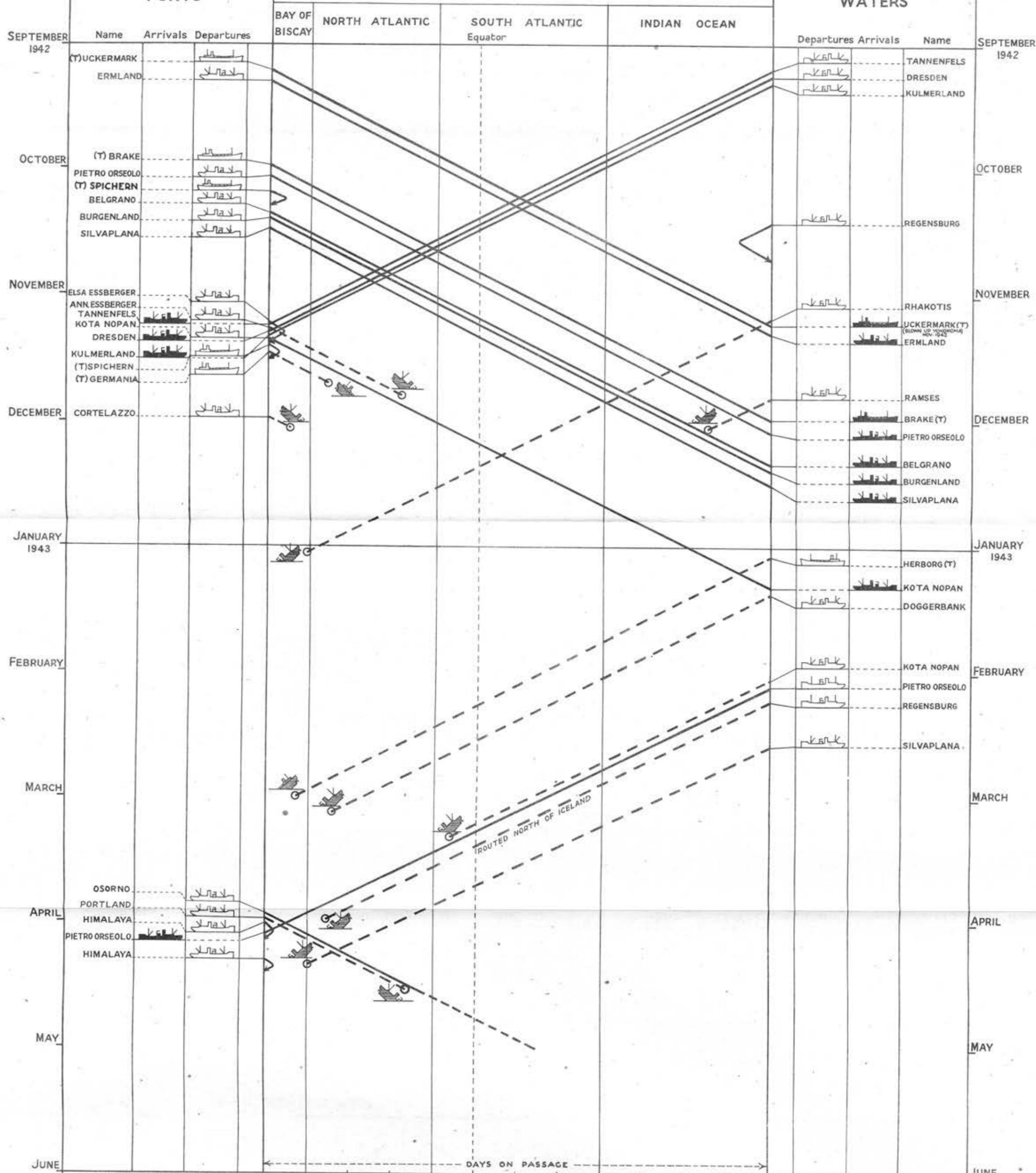


Another photograph showing the principal vessel of the convoy enveloped in smoke. She has been identified as the Norwegian *Hough Carrier*, 4,906 tons. (See also Plate 7 and letterpress page 20.)

# FAR EASTERN BLOCKADE RUNNING SEPTEMBER 1942 - APRIL 1943

**BAY OF BISCAY PORTS**

**FAR EASTERN WATERS**



SUMMARY OF CARGOES		
COMMODITY	LANDED TONS	LOST TONS
RUBBER	16,000	29,000
TIN	1,000	6,500 +
TUNGSTEN	100(?)	200 +
QUININE EXTRACT	—	40
BARK	—	30 +
EDIBLE OILS	10,000	20,000
TEA	1,500	250

+ MINIMUM ESTIMATES

SUMMARY OF VOYAGES	
← EAST BOUND	WEST BOUND →
TOTAL VOYAGES ATTEMPTED (13 MVS + 5 TANKERS)	18
NO. OF BLOCKADE RUNNERS INVOLVED (13 MVS + 4 TANKERS)	16
BLOCKADE RUNNERS SUNK	4
BLOCKADE RUNNERS SERIOUSLY DAMAGED	2
VOYAGES FRUSTRATED	5
SUCCESSFUL VOYAGES	8
SHIPS ON PASSAGE AT APRIL 30 <sup>th</sup>	1

**SUMMARY OF CARGOES**

OWING TO NATURE OF GOODS CONSIGNED, E.G., HEAVY PLANT, TURBO GENERATORS, MACHINERY, SPECIAL COMPONENTS, CHEMICALS ETC., NO QUANTITATIVE ANALYSIS CAN BE MADE. FURTHER, A STATEMENT OF CAPACITIES IS MISLEADING SINCE A NUMBER OF EASTBOUND BLOCKADE RUNNERS HAVE BEEN ONLY PART LOADED.



groups in this signal, which could not be decoded, it was deduced that the aircraft was over the dinghy, and thereafter call sign OG50 was listened for in addition to call sign 50W10 on the M/F D/F wave. (Note.—50W10 was the special air-sea rescue call sign allotted to aircraft L/210 and given to *Wensleydale*.)

At 1100 hours OG50 commenced making homing signals, and at 1104 hours a 2nd class bearing of 250° was obtained. Course was altered to 250°. Subsequent bearings were taken as follows:—

1125 bearing 250°	} Between 1210 and 1245 50W10 took over from OG50, but no definite information of this fact was received from either aircraft.
1200 bearing 250°	
1210 bearing 249°	
1245 bearing 251°	
1249 bearing 251°	

At 1345 hours I considered I had passed through the longitude of the amended position of the dinghy, and anticipated sighting the aircraft circling over it.

At 1400 hours, there being neither sign of the aircraft nor any report from the escorting Beau-fighter, which had been extremely helpful in searching 10 miles on either side of my track in response to a signal made by V/S at 1045 hours, I broke W/T silence and established communication with both aircraft as shown in the following extract of the operating log:—

- 1305 Communication established with OG50.
- 1307 From *Wensleydale* to OG50:—"What is my bearing from you?"
- 1320 Message received and acknowledged by OG50 but not answered.
- 1321 Answered call from 50W10 but this was still not acknowledged.
- 1330 Bearing of 50W10 was 251°.
- 1338 Communication was established with 50W10 and ship's bearing from him requested.
- 1343 Bearing of 50W10 was 250°.
- 1355 Bearing of 50W10 was 247°.
- 1400 From *Wensleydale* to 50W10:—"What is my bearing from you?"
- 1406 From *Wensleydale* to 50W10:—"Are you over dinghy?"
- 1407 Signal acknowledged by 50W10.
- 1410 From 50W10 to *Wensleydale*:—"Yes."

- 1414 From *Wensleydale* to 50W10:—"What is my bearing from you?"
- 1418 From 50W10 to *Wensleydale*:—"Carry out homing procedure."
- 1420 } Homing procedure again carried out.
- 1424 }
- 1425 From 50W10 to *Wensleydale*:—"Wait; will call you."
- 1435 From 50W10 to *Wensleydale*:—"Unable to determine your position."
- 1445 From 50W10 to *Wensleydale*:—"Your bearing 096°, 3rd class bearing."

Good bearings of the aircraft's signals, which varied between 249° and 253°, were constantly obtained, so course and speed were maintained. At 1440 hours a Catalina aircraft was sighted ahead at a distance of 8 miles, circling over a fixed position. V/S communication was established at 1455, and the aircraft was asked to dip over the dinghy.

The aircraft dipped, bearing at 250°. The dinghy was sighted ahead, distant 2 miles, and at 1500 hours the ship was brought alongside the dinghy and the nine survivors climbed on board over the scrambling nets, assisted by the ship's rescue and first-aid party."

The Commanding Officer of the *Wensleydale* considers that this rescue would not have been possible without the aid of the aircraft's homing signals, owing to the inaccuracy of the reported positions. Homing procedure carried out by both aircraft was entirely satisfactory.

The fact that the *Wensleydale* was not informed that L/210 had taken over from O/461 was because he was not able to keep an additional W/T watch on the aircraft recco. wave. The fact that considerable delay was experienced by the *Wensleydale* in obtaining the bearing of the ship from the aircraft was due to the fact that *Wensleydale* first requested the bearing by the use of the operating signal X805, which had not, at that time, been incorporated as an amendment to our aircraft Operating Signal Book, AP 982.

The whole operation reflects great credit on the wireless operators concerned, and more than justifies the extreme importance of aircrews knowing how to carry out D/F homing procedure.

## Halifax Meets Seven Ju.88's

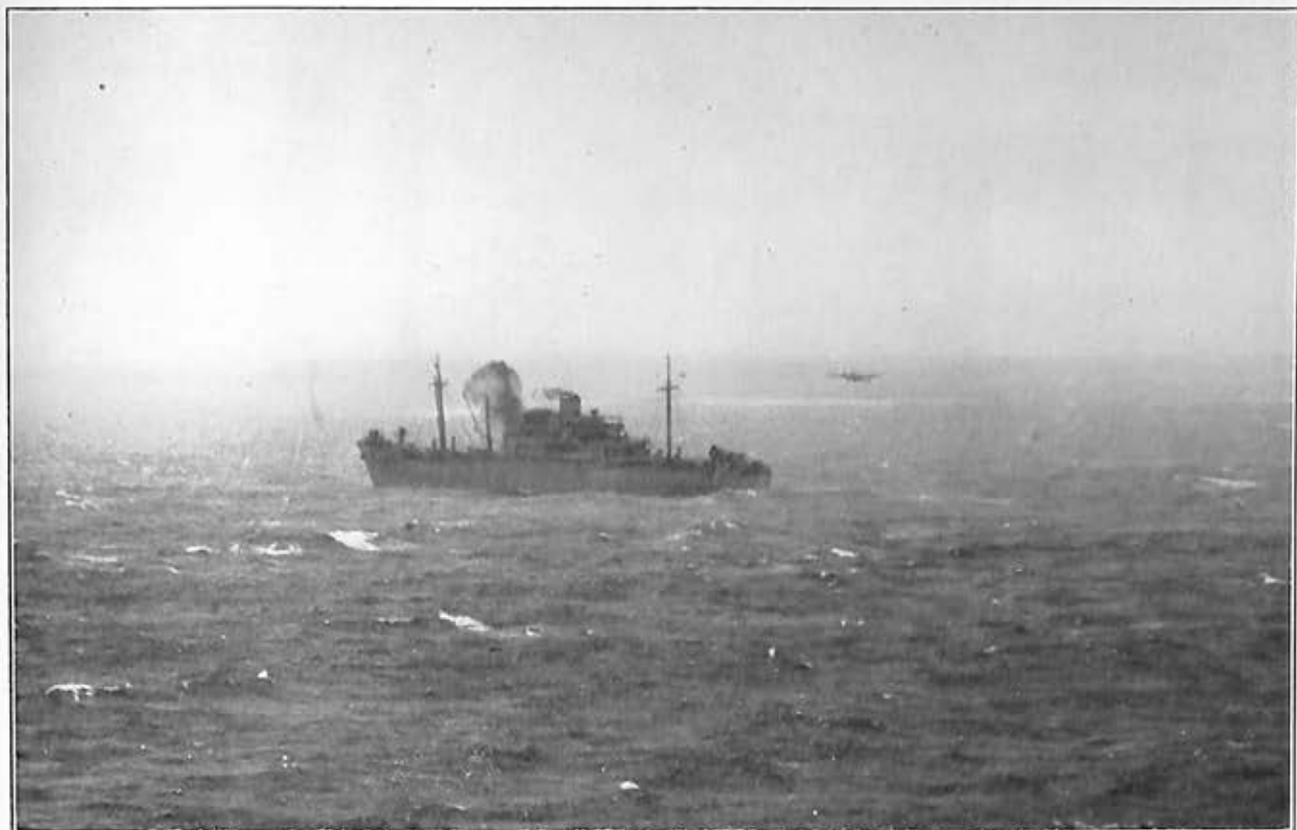
Halifax "F" of No. 58 Squadron on A/S patrol in the Bay of Biscay was being flown by the second pilot at 2,000 ft. in 4/10ths strato cumulus, when the captain on lookout in the front turret, sighted seven Ju.88's, bearing 45° on the starboard bow, flying at 1,500 ft., distance one mile. The first pilot took over the controls and the enemy aircraft turned to starboard, apparently to get between F/58 and base. F/58 jettisoned its depth charges and climbed to 3,000 ft. to make for available cloud cover. The enemy aircraft now positioned themselves to attack.

The engagement which followed lasted 47 minutes. The enemy aircraft attacked only one at a time from different angles, principally

on the beam, bow or quarter attacks, but no attack was made from dead astern. While one aircraft was committed to attack, the remainder manoeuvred and feinted, apparently with the intention of distracting the attention of the gunner of F/58.

The enemy aircraft pressed home only three of these attacks, which were costly to him as they flew into deadly cross fire from the gunners. Two Ju.88's went away with thick brown smoke coming from the engines, a third with machine gun strikes seen in the engine cowlings. These five aircraft did not return to renew the attack.

The only damage to F/58 were three dents on the port side fairing of the turret, and a bullet through the tail plane.



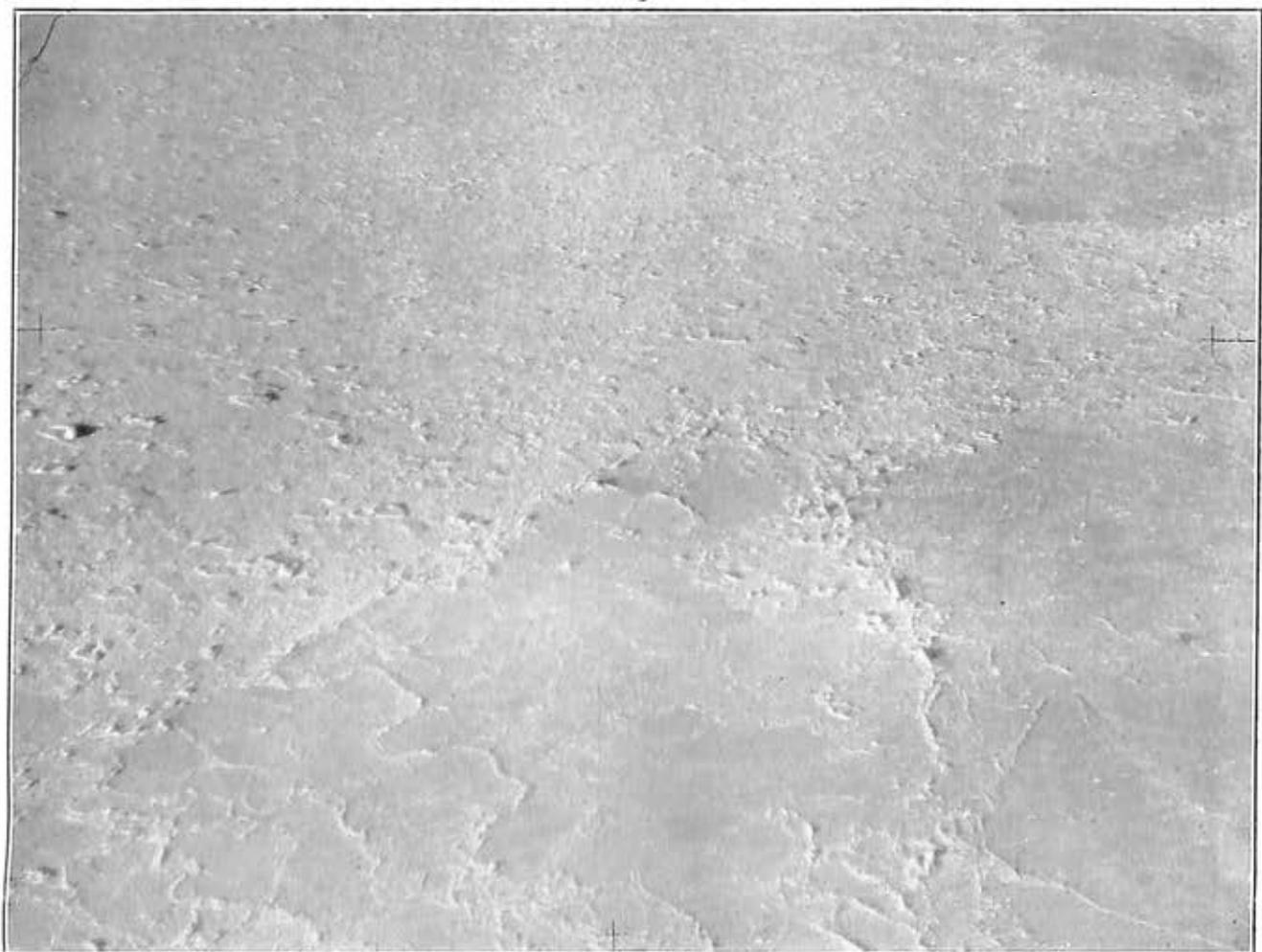
This photograph shows a hit on a ship of modern appearance, of about 7,000 tons, by Hampdens of 489 Squadron, on April 4, off Kristiansund (N). The ship, which is assessed as sunk, is similar to a number that have been associated with troop carrying. (See letterpress page 19.)



This photograph shows the column of smoke that arose after a torpedo hit by a Hampden of 489 Squadron, off Statlandet, on a 6,500-ton tanker, on April 9. This ship, which was northbound, was compelled to turn back to Bergen where she now lies, with a hole in her port side nearly 40 ft. long. (See letterpress page 19.)



Drift Ice. (See letterpress pages 23 and 24.)



Packed Drift Ice. (See letterpress pages 23 and 24.)

# IV.—SPECIALIST AND GENERAL ARTICLES

## Ice Reconnaissance

The success of an ice reconnaissance is dependent mainly on three factors: first and foremost, weather conditions; secondly, the accuracy of D.R. Navigation throughout a long sortie involving frequent changes of course; and thirdly, accurate assessment and plotting of the ice.

In all these respects, the sortie carried out by aircraft T/269 on February 6, 1943, was one of the most successful in the series of ice reconnaissances made by long range Hudsons of this Squadron. Weather conditions along the ice edge were almost ideal for the purpose except for a belt of low cloud which prevented observation of the brash ice over a distance of

24° 30' W.) at 1039A; brash ice was encountered at 66° 50' N., 26° 20' W., and drift ice about 5 miles to the North-West of this position. The aircraft then set course along the edge of the drift ice in a North-Westerly direction.

The weather, although ideal from the point of view of reconnaissance, was far from pleasant, the air temperature falling to 23° C., and, as most of the heaters in the aircraft became unserviceable, the crew suffered some discomfort from the cold. Hot coffee which was spilt on the floor of the aircraft froze in a few minutes. Ice formed round the corks of vacuum flasks and frost had to be wiped frequently from the inside of the perspex.

### COPY FORM ORANGE

ASTRA/KALDA NR14. CORRECT VERSION FORM ORANGE IMMEDIATE  
PASS TO SELF AND NOBI. AND REYKJAVIK.

To: H.Q., R.A.F., Iceland—Repeat—Nobi—Repeat—Reykjavik.  
From: Kaldadarnes.

- A. 1. Kal/08/6/Feb./43. 2. Ice/G1/2/Feb.  
3. Hudson T/269.

B. Ice Recco.

0923A/6/Feb. A/B Kaldadarnes S/C Coastwise Bjartgangar.

1039 Bjartgangar S/C on track 330.

1118 66-46' N., 26-20' W. over 1/10th Brash ice.

1121 66-51' N., 26-27' W. over ice edge 9/10ths drift ice (20-200 ft.). S/C to follow ice edge to N.E.

1144 67-26' N., 25-14' W., over 10/10ths. Drift ice (200-600 ft.).

1150 67-33' N., 24-40' W., over 7/10ths. Drift ice (20-200 ft.). One iceberg.

1236 68-15' N., 20-50' W., over 7/10ths. Drift ice (200-600 ft. or 600 ft. to 1 mile).

1256 68-12' N., 19-10' W., over 10/10ths. Drift ice (20-200 ft. and 200-600 ft.).

1305 68-25' N., 18-00' W., over 8/10ths. Drift ice (20-200 ft.).

1340 69-07' N., 16-10' W., 10/10ths. Brash ice (200-600 ft.). Extending to posn.

1355 69-25' N., 15-15' W., 8/10ths. Drift ice (200-600 ft.).

1410 69-40' N., 13-30' W., 9/10ths. Drift ice (20-200 ft.).

1429 70-03' N., 11-40' W., over 8/10ths. Drift ice (20-200 ft.). Sighted Jan Mayen visually.

1432 70-05' N., 11-30' W., ice edge continuing on bearing 050. S/C Straumnes.

1603 67-39' N., 19-34' W., E.T.A. Straumnes 1644.

1652 Landfall 10 miles east of Straumnes. S/C over claw to Stykkisholmur, thence coast-wise base.

1810 MTB1 "E60".

1827A/6/Feb. Landed base.

Edge of drift ice plotted through positions:—66-51' N., 26-27' W — 67-12' N., 25-48' W. — 67-30' N., 24-30' W. — 67-48' N., 22-55' W. — 68-02' N., 21-48' W. — 68-05' N., 20-49' W. — 68-14' N., 18-35' W. — 68-22' N., 17-55' W. — 69-00' N., 16-00' W. — 69-35' N., 13-44' W. — 69-48' N., 12-15' W. — 70-05' N., 11-30' W. — thence on bearing 050 Jan Mayen sighted and estimated icebound.

H. 1. 70 N., 11-30 W.

2. 1430A.

3. Sixty miles plus.

4. Nil.

5. 12 kts 020/2500 ft.

6. N/A.

7. Fine temp. minus 23.

8. Five N.E. of 67-30' N., 19-30' W. S.E. of this posn. 10/10 CU from sea level to 8,000 ft.

T.O.O. 1940A/6.

about 100 miles. The edge of the drift ice, which is of course far more important, was plotted continuously for roughly 450 miles, and the total flying distance involved was 1,300 miles. Course was set from Bjartgangar Light (65° 30' N.,

At 1430 hours, the pilot sighted land ahead, and for the moment thought that the navigation had gone haywire. But he had no cause to worry, for, in a few moments, the land became recognisable as Jan Mayen Island, with the

## A Letter from Nassau

March 25, 1943.

"In the Spring of 1942, No. 111 O.T.U. began building as an American-manned Station in which the Royal Air Force instructors and pupils would be lodgers. Soon afterwards the policy was changed so that the station became a wholly Royal Air Force Unit, to be built under Lease-Lend.

"We made a start and the first batch of pupils will be leaving for Coastal Command on April 7.

"We have two aerodromes which surpass any which I have seen in America or England. The main field has three runways, 1,700 yards long and 500 ft. broad. The satellite (a complete misnomer as it is going to house about 1,100 officers and men) is about seven miles from the main field. Here the two important runways are 2,400 and 2,600 yards long and, again, 500 ft. wide. The third is over 1,700 yards. I treat the satellite as a separate station and do all the Liberator training there.

"As soon as the two stations began to take shape I realized that they would eventually be capable of training far more than the 13 Liberator crews, the original Air Ministry figure. I recommended an expansion which was approved and the new building work, which will nearly double the station in size, has begun. The net result will be that I shall have two large stations as well built and equipped as any in the Royal Air Force.

"One would naturally imagine that an island 200 miles by sea from the U.S.A. would be difficult to supply. This was true for the first few months, mainly because of shipping shortages. Now, with one small gasoline tanker and another small ship to bring us rations, equipment and 184 pupils every month, we should manage quite well. I have no particular fears on this point.

"As regards operational practices we are in a very fortunate position. At Miami, 165 miles by air, and at Porto Rico, about 400 miles south, are American Admirals with organizations closely parallel to Area Combined Headquarters. I am

just about on the boundary line between their areas and have fixed up good signal communication with them. I also have their liaison officers working with the controllers in my operations room, a large building designed by ourselves on Coastal Command lines. I find this works splendidly because I have first-hand news of all the convoys which must pass close to Nassau, of all the U-Boats and of all the merchant and navy shipping on the high seas within hundreds of miles of the O.T.U. These are the forces I use for pupils' practice. Pupils can, of course, follow the full procedure without risk from enemy aircraft but with the chance of attacking a real U-Boat with depth-charges on all their escort and navigation exercises.

"Our weather for training is very good indeed. There is plenty of cloud, 40 inches of rain a year, but only in short sharp doses, and all the usual tropical thunderstorms which are of short duration. We can fly by day and night, about 340 days in the year. But the weather is not so perfect as to give pupils a sense of false security. Nevertheless, when they reach Coastal Command, they will be strangers to continuous rain and low cloud, and, like most pupils trained abroad, will have to be acclimatized to them.

"The Royal Air Force permanent staff, airmen included, have done a splendid job of work and the local people, as well as holding a high opinion of their conduct, are almost overwhelmingly hospitable and generous to them. I feel they have earned this opinion and deserve the good will they have acquired.

"I have my own W. and B. section, with an American engineer major on my staff, and I have also the equivalent of a Maintenance Unit to tackle crashes and major repairs. The Air/Sea Rescue contingent has about half a dozen fast craft, including a motor torpedo boat armed with depth charges, and all of them carry guns of sorts. It is practically a miniature navy itself.

"I hope you will like our Liberator crews when they arrive."

## Effectiveness of Bombing Practice

For the period 5.1.43 to 14.4.43, there are 72 UBAs which specify the number of practice bombs dropped during the previous month, and for which there is an assessment of the attack by S.N.S.O. These assessments have been classified roughly into "Good" (damage certain or probable) "Moderate" (Shake-up likely) and "Bad." The attacks have then been classified according to whether the pilot had dropped more or less than 10 practice bombs in the previous month.

It is found that pilots who had dropped less than 10 bombs made 38 per cent. good attacks, 24 per cent. moderate attacks, and 38 per cent. bad attacks.

Pilots who had dropped more than 10 bombs made 60 per cent. good attacks, 25 per cent. moderate attacks, and 15 per cent. bad attacks.

Thus the percentage of good attacks was increased by practice from 38 per cent. to 60 per cent., *i.e.* by rather over 50 per cent. And the amount of practice represented by only 10 bombs is sufficient to cut the percentage of bad attacks from 38 per cent. to 15 per cent., *i.e.* to less than half.

It is possible that a greater amount of practice than 10 bombs in the previous month would have produced even better results, but there were not enough cases to decide this.

## On the way to Gibraltar

### A Letter to the Editor

"During the past few months I have read several different accounts from aircrew who flew through cumulo-nimbus cloud with violent air currents and electrical disturbances. I have had a similar experience and thought that it might be of interest to others who have spent a few frightening moments inside of those nasty big black clouds.

"It was on a transit flight between the United Kingdom and Gibraltar, around the middle of December, 1942. I had made the same trip several times and knew the route by sight. This, together with 1,100 hours ops., and a total of 1,400 hours on the type of aircraft, inclined me to be a bit over-confident about the trip.

"We started about 0200 hours so as to arrive early in the morning. Right at the start I began to climb the Hudson and be above any ice as well as assisting astro-nav. and making a good air speed. We finally levelled out at 12,000 ft., well in the clear. Everything was too perfect.

"About 3 hours out, the thought of coffee and sandwiches lured me away from the controls, and the second pilot (who was a spare body) took over. He released 'George' and was doing the flying himself. It was the first time I had seen him fly, as he was a new lad out of an O.T.U. After watching him for 10 minutes, I was happy about his ability, and I silently praised the training on instrument flying that pilots are getting these days.

"At 0630 hours the engines were purring beautifully. My mind had already completed the trip, and I was contemplating the pleasant process of peeling a banana. Just then I noticed that a great black wall had cut out the stars. It was certain that we would encounter icing, once we were in it, so the carb. heaters were put in and de-icing equipment checked. The stuff was too high to go over and it seemed a bit hopeless to try to go round. The only thing to do was a quick descent.

"We were in the cloud only a few minutes when the ice began to form. It was not heavy, and it kept breaking off in thin sheets. At about 7,000 ft. we entered cloud, which seemed more turbulent than what we had met before. It was then that blue flames, 6-8 ins. long, began leaping from the wing tips, aials, and propellers. The machine began to drop rapidly, and hit bumps which were making the altimeter jump up and down two to three hundred feet.

"The rest of the crew had never before seen St. Elmo's fire, and the pilot, who had been doing such a good job on the instrument flying, was gaping with open mouth at the beautiful little lights on the wing tips. I made some short, rude remarks, which had the desired effect, and he carried on the business of clock watching.

"Then there came a short calm. At this time we were at 4,500 ft., so we swapped seats rapidly.

He carried out a check to see that all the wireless was off, and the trailing aerial in. It so happened the W/T Operator had taken action long before and all had been done.

"Suddenly the bumps began again. This time we were going up at a terrific rate. If the first time had been bad, it was a pram ride compared to this. The St. Elmo's fire had increased until the flames were jumping 2 to 3 ft., on the wing tips and aials. The propellers were two great discs of fire, like the fire wheels one used to see on Guy Fawkes night, only on a much greater scale. It was raining hard and the water drops, which partially froze as they hit the aircraft, were little balls of fire. They made the windscreen look like a solid sheet of flame. The whole aircraft was glowing with the weird blue light. We were all so astounded by the amazing phenomena that the fact that I had throttled well back, and we were being thrown all over the sky, despite desperate wrestling with the controls, did not seem to penetrate my mind. The nose was at an alarming angle, according to the artificial horizon and the rate of climb indicator. The altimeter at this time was reading 8,500 ft. All the time it felt as if some giant hand was shoving the aircraft one way and then the other. Probably the whole thing did not last more than 3 or 4 minutes, but it seemed like ages.

"After coming into another down draft and levelling out at 2,000 ft., I decided that it would be best to stay low.

"It didn't seem long afterwards when dawn broke. Then everyone settled down to the rest of the flight with a feeling of relief. I do remember in the middle of it all that I made a mental promise to take back all the rude and sharp words I had previously said to my co-pilot. The W/T Operator had cut his hands holding on to something to keep from hitting the roof. A most remarkable thing was that during the worst of it, the co-pilot had somehow managed to fasten my harness, and fasten himself down at the same time. It is an easy thing to think of it later. But for anyone who does not appreciate the difficulties he had, I might add that it was a feat of strength, acrobatics, and all-in wrestling combined.

"The remainder of the trip was quite normal. The only special precaution necessary was to see that the aircraft was well grounded after landing, although the tail wheel is normally a good conductor of electricity.

"This little episode is not the most scaring that has come my way; but I can truthfully say that it was certainly the most startling. It gave me the busiest 5 minutes I have ever spent in the air. I am glad it happened, because if I ever meet one of those nasty black clouds again I shall certainly recognise it, on the darkest night, and I shall either climb over or go under."

## Use of Binoculars by Visual Lookouts

Air crews of the Command are now provided with excellent binoculars and instructions for using them. Although their value is recognised by most crews, a few instances of their use and some suggestions for getting the most out of them will be of value.

For purposes of recognition of objects already sighted with the naked eye, the use of binoculars by air crews is essential. Although any suspicious object should be assumed to be a U-Boat until identified as some surface craft, the sooner this identification takes place after sighting, the more successful will be the attack.

The following are some bad examples of the use of binoculars:—

- a. Sighted wake 4 miles ahead—lost height to investigate . . . at 300 yards identified U-Boat.
- b. Pilot sighted what he took to be small surface vessel of coaster type, subsequently identified as U-Boat. C.O.'s remarks were: "Crew took rather a long time to identify U-Boat and so were too high to carry out an attack on the first run.
- c. Sighted what appeared to be a fast motor launch 5 miles distant—a/c altered course and dived to 100 ft. to investigate, when at distance of  $2\frac{1}{2}$  miles, identified it as a U-Boat.

The following are instances where binoculars were used properly:—

- a. Sighted disturbance on port bow, looked at distance through binoculars and discovered it was a U-Boat at 6 miles.
- b. Pilot sighted what appeared to be small ship at 12 miles on port bow. On investigation through glasses identified as U-Boat.
- c. Wake sighted by front lookout, identified with binoculars by the second pilot.

So much for the commonest use to which binoculars are put by air crews. Since binoculars increase the range at which objects may be picked up, they will, if used for searching for objects not already seen, increase the range at which U-Boats will be picked up. This will increase the chances of the aircraft seeing the U-Boat first, *i.e.*, beating the binocular lookouts on the U-Boat at their own game.

Some examples of this use are given below.

- a. Captain sighted U-Boat 6 miles with binoculars.
- b. Flt./Eng. using binoculars saw periscope feather moving away from vicinity of M|V.s.

There have been three binocular sightings in the last two months, two of which were excellent:—

- a. A|G from front turret sighted U-Boat 6 miles (Met. vis. = 15).
- b. First Pilot from starboard seat sighted U-Boat 12 miles (Met. vis. = 20).

There have not been many binocular sightings as compared to naked eye sightings, but although this number is small, it is on the increase.

Before using binoculars for scanning, read Coastal Command Tactical Memorandum No. 50 and try out the simple wooden binocular holder suggested. Many aircrews have tried it out and found it very useful. You do not have to lean against the aircraft for support, and the holder takes the weight of the binoculars. If this device is used, and the binoculars are correctly adjusted, eye fatigue will not develop. One more thing. Next time you look through your binoculars, have a look at the glass of the eyepieces. It probably needs cleaning.