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COASTAL COMMAND REVIEW

May, 1943

Vol. II, No. 1

HEADQUARTERS,
COASTAL COMMAND
ROYAL AIR FORCE

COASTAL COMMAND REVIEW

Vol. II, No. 1—May, 1943

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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

May, 1943

1. It is very satisfactory to be able to look back on another record month for Coastal Command—a month, moreover, in which all previous records against the U-Boat have been put in the shade, not only by the Command, but by the surface escorts, the Fleet Air Arm and the Canadian and American squadrons operating from Newfoundland. As usual we are in the unenviable position of having to “report a football match without being able to give the final score.” But we can say that the squadrons in the United Kingdom, Iceland and Gibraltar had 213 sightings and 136 attacks in the month and that their total of known kills already runs well into double figures. The grand total of U-Boats killed in May by all Allied air and surface forces cannot yet be announced, but it is known to exceed by a very substantial margin the total monthly production from German yards.

The following signal was received from the Chief of the Air Staff on June 1, which will be a source of pride to all ranks in operational and training units alike :—

“I wish to express to you and all under your command my admiration and warmest thanks for your achievements in the anti-U-Boat war during the month just ended. The brilliant success achieved in this vital field is the well deserved result of tireless perseverance and devotion to duty and is, I am sure, a welcome reward for the aircrews and others who have spared no effort during long months of arduous operations and training. Now that you have obtained this remarkable advantage over the U-Boats I know you will press it home with ever-increasing vigour and determination until, in conjunction with the Royal Navy, you have finally broken the enemy's morale.”

2. It is difficult to over-estimate the importance in Allied strategy of these results. Goebbels has been trying to comfort the German people for their disasters in Tunisia and Africa and for the terrors of our Bomber offensive by playing up the U-Boats and promising victory at sea. That trumpet has been sounding a less certain note of late ; what will happen when the Nazis at last hoist in the fact that their last hope of avoiding decisive defeat has disappeared—largely through the efforts of Coastal Command ?

3. Many of us in Coastal no doubt sometimes envy our friends in Bomber and Mediterranean Air Commands their share in the shattering offensive which has been such a heartening feature of the last month's news. But if we can keep up this rate of killing against the U-Boats, or anything near it, we are doing as much as anyone to hasten the collapse of the Axis. If we could really kill the U-Boat menace once and for all many of us could be spared to take part in the more direct offensive against objectives on German and Italian soil.

Some of us no doubt also say to ourselves, “Why can't we have some more and better aircraft to make a job of this more quickly ?” The answer is—look at the Ruhr, look at the Moehne and Eder dams, Nuremberg, Stuttgart, Kiel, Berlin and a score of other German industrial centres ! Listen to the squeals of Goebbels, and the clumsy propaganda in the Spanish press, look at our Mediterranean Air Forces who were so largely instrumental in kicking the Hun out of Africa (at the cost of about the same number of casualties as we had on the opening day of the Somme battle in 1916) and who are now shaking the Wop to his groggy foundations. Our Air Power is great and growing, but it is not unlimited and a sudden increase in one Command can only be at the expense of others. It is the business of the Chief of the Air Staff and of those responsible for the higher direction of war to decide what proportion of the available resources can be allocated to Coastal Command ; it is our responsibility to see that we squeeze the last ounce of value out of the resources allocated to us—and we cannot honestly say we are doing that yet. By the time this number of the *Review* goes to press the task charts for all squadrons in the Command will have been issued as an Appendix to the new instructions for Planned Flying and Maintenance. It is up to all ranks to see that the Flying task set in those instructions is met and, if possible, exceeded as far as sound maintenance will permit.

4. The high lights of the month's anti-submarine operations were the notable action on the night of the 5th/6th, when six U-Boats were killed round O.N.S. 5, five of them by surface escorts and one by an aircraft of Eastern Air Command ; the battle between May 19 and 21 inclusive, round SC130 when that convoy was fought through a huge pack without the loss of a single ship—Coastal Command getting 30 sightings and 10 attacks (one aircraft, P/120, had eight sightings in one sortie, which amply illustrates the need for a better depth-charge load in V.L.R. aircraft) ; the success of the British and American auxiliary carriers who got two kills in the month, including one by a Swordfish of H.M.S. *Archer* using the R.P. weapon for the first time against a U-Boat ; and the period of ten days in which aircraft of the Command killed one U-Boat every two days.

5. But another very significant success—which perhaps has not been generally recognised for the minor victory that it was—was that achieved by the Leigh Light Wellingtons in the Bay. This month's operations have proved beyond doubt that the U-Boats have been so

Frontispiece opposite : The Moehne Reservoir. See letterpress, page 17.

shaken by the success of our night attacks in April that they are surfacing to charge batteries and renew their air supply virtually only by day, which undoubtedly has resulted in more sightings and attacks than would otherwise have been possible. It is for this reason that the night effort of the Leigh Light Squadrons has recently been reduced and night Wellingtons have been used by day. This is admittedly a nuisance from the maintenance point of view, and to some extent wasteful of the special experience and skill of the night crews; but the one thing we must avoid is becoming rigid—we must be ready at a moment's notice to adjust our tactics and technique to counter every move of the enemy; night squadrons must be ready to operate by day and *vice versa* if by doing so we get more opportunities of killing U-Boats.

6. As an illustration of one feature in the planning of A/S operations it may be of interest to compare calculated with actual results. On the basis of calculations made in March we should have expected, with the aircraft available, to get 19 sightings by day and nine by night in the special operations area in the Bay of Biscay, between April 13 and dusk on May 2—that was on the assumption (proved in the event to be correct) that the U-Boats would be surfacing at random throughout the 24 hours. The actual sightings during that period were 20 by day and 14 by night. During the period from dusk on May 2 to dawn on May 20 in the same area, when it was clear the U-Boats were surfacing only by day, our calculated expectations were 34 sightings by day and nil by night; the actual results were 42 by day and one by night. This shows, if proof were needed, that these O.R.S. calculations are a very valuable factor in planning. Another interesting point is that these statistical calculations, based on scientific analysis of past experience and of information from Intelligence sources, give good ground for the belief that about two U-Boats spot an aircraft and submerge without being seen for every one that is seen by the aircraft. In May there was an average of one sighting in the Bay about every seven hours; so one U-Boat was either sighted or had to crash-dive to avoid being sighted on the average about once every 2½ hours. Crews can thus have the satisfaction of knowing that they are playing a useful part in the war against the U-Boat even when they do not get a sighting, because having constantly to submerge not only wastes time on passage and thus reduces useful time on patrol, but is also very wearing to the nerves of the U-Boat crews.

7. We have rather a variety of weapons in the A/S squadrons at present. This is liable to be a nuisance, and complicates maintenance and training. But we cannot yet be satisfied with the proportion of attacks that prove lethal, and must experiment with new weapons as well as improve our technique in the use of the old ones. Again we must not be conservative about new sights. The "airman's eye" method (or as it is sometimes, usually unfairly, called, the "chuck and chance it" method) may be all very well up to a point but it is not giving us anything like the rate of kills required; and with a bit of training the new sights will enable the novice to plant his stick with the accuracy of the present old hand using his "airman's eye"—and from higher up. The Mark III low-level bombsight was used in anger for the first time in May when a new crew of 86 Squadron made an excellent and very promising attack using Mark XI depth-charges. The Mark XIV sight was used by No. 311 Squadron in connection with the new 600-lb. depth bombs: it is thought that this first employment of a new weapon produced decisive results.

8. By the time this number of the *Review* is published it is hoped that an important development will be fully realized, namely the formation of a Combined Services Training centre for A/S warfare, with particular reference to convoy cover. This business of killing U-Boats is a team game in which everyone—shore-based and carrier-borne aircraft, escort vessel and merchant skipper—must know and play his part as one of a team and has a lot to learn from the other. Neither of us, airman or sailor, can say he has got his own individual job thoroughly buttoned, let alone the more complicated job of working in with the other man; to think so would be dangerous complacency, for the essence of the game is to be always at least one jump ahead of the Hun in tactics, technique and scientific aids.

The Combined A/S Training centre will have a joint instructional staff drawn from the Navy and Coastal Command; courses will last about a fortnight and will be attended by one crew from each of six squadrons who are employed on convoy escort, and by Fleet Air Arm crews and officers of surface escorts; and, apart from the syllabus of instruction which will include lectures and practical exercises in the air and on the ground, the course will provide a splendid opportunity for pooling experience and getting to know each other's problems.

9. There have been some developments in the system of co-ordination of air operations in the Atlantic, referred to in paragraph 4 of last month's summary. Early every morning there is a three-cornered conference over the telephone between Coastal Command, Western Approaches and the U-Boat Intelligence department at the Admiralty; the convoys requiring air cover the following day are agreed in order of priority, together with any future commitments likely to crop up in the course of the next few days for which Group Commanders may want to reserve some resources. The result is sent out by H.Q.C.C. in a signal to all Groups concerned, including 1 Group R.C.A.F., at St. John's; The Group Commanders in Newfoundland, Iceland and United Kingdom then inform each other by means of the "V.L.R." signal of what they can do next day, so that each knows the positions and times at which the others can cover the convoys, and can adjust his plan accordingly.

10. Another development is the Combined Procedure Board which had its first meeting at St. John's early in June. The duty of this Board, which includes representatives of Coastal Command, the R.C.A.F. and the U.S. Army and Naval Air Forces, is to arrive at a single combined system of operational intelligence and signals procedure for use by all A/S squadrons in the Atlantic; so that an American or British or Canadian squadron can move from one area of the Atlantic to another without having to waste time learning a new procedure.

11. The Strike squadrons have not had quite the same opportunities as they did in April, but have done some useful work. Moreover, their earlier successes have not only made the enemy a good deal more cautious in moving convoys during daylight, but have also forced him to escort them more heavily. This month's experience has emphasized again the need for the most meticulous planning and timing of these strike operations in heavily defended areas, and the eventual value of adequate anti-flak escorts to take on each of the enemy escort vessels while the torpedo aircraft go in to attack. There is good reason to believe that the enemy flak gunner simply cannot stand up to the hail of cannon fire from the escorting Beau-fighters. No. 12 Group, as usual, have given us most valuable support.

12. The outstanding performance of the P.R. squadrons this month was the superb photography of the after-effects of Bomber Command's magnificent attack on the Ruhr dams.

It is probably not commonly recognized what a highly skilled and dangerous job it is to penetrate into the most heavily defended area in the world and get photographs such as those which form the mosaic reproduced as a frontispiece to this number of the *Review*.

13. May also set up a record for Air-Sea Rescue work, 380 sorties by A.S.R. aircraft, 220 by the boats and 676 by other aircraft saved 178 lives in the month—the previous record being 160 lives saved in June, 1942. A high light of the month was the first and most successful use of the airborne lifeboat, described in detail later in this issue.

THE PRIME MINISTER ON U-BOAT WARFARE

Mr. Churchill in his statement in Parliament on June 8¹⁹⁴³ said: "In the summer of last year I set on foot a policy of increasing our bomber effort, which entailed certain sacrifices in other directions. All that is now coming into being. At the same time we took measures which have thrown the long-range aircraft—the very long-range aircraft called V.L.R.—effectively into the anti U-Boat struggle."

"The month of May is, from every point of view, the best month we have had in the U-Boat war since the U.S. was attacked. Combined new building has exceeded our losses by more than three to one. This first week in June could not possibly be taken as a criterion but, as a matter of fact, it is the best ever. In May, for the first time, our killings of U-Boats substantially outnumbered the U-Boat output. That may be a fateful milestone. The Germans seem to be staking their hopes on the U-Boat war . . . I feel confident that the U-Boat war will not stand between the United Nations and their final victory while all the time the air war will grow in weight and severity."

I.—ANTI-SUBMARINE

Anti-Submarine Operations, May, 1943

The number of U-Boats sighted and attacked by Coastal Command during the month of May, 1943, has been much higher than in any other single month of the war. Two hundred and thirteen U-Boats were sighted by operational aircraft, which, with an odd four by transit aircraft, makes 217; of these 136 (64 per cent. of operational sightings) were attacked. This number of attacks does not include attacks with minor weapons, such as machine guns. It is perhaps worth comparing this with the two previous highest points of our campaign. In November, 1942, there were 147 sightings and 86 attacks—112 sightings and 66 attacks being off Gibraltar during the early days of Torch—and during last month, April, 1943, 150 sightings and 77 attacks. The number of attacks in May (136), has been within 20 per cent. of the total of 163 obtained in these two previous record months put together.

This great success has been due mainly to two factors; a series of successful counter-attacks on U-Boats around convoys, and the great increase of results in the Bay of Biscay. Taking the convoy results first, as far as is at present known no ships at all have been sunk inside 600 miles from Coastal Command bases. Of the 20 ships shown as sunk, on the chart in this number of the *Review*, the 15 which were sunk actually from convoy were all from four convoys.

The first and heaviest of these attacks was on the Convoy ONS.5, in which the majority of the losses were between 600 and 400 miles from Canadian bases. No counter-attacks were made by aircraft based on this side of the Atlantic as the attack developed too far away. However, several attacks were made by Canadian aircraft. The next ON convoy was apparently picked up on the 6th. Escort was provided by three U.S.N. Catalinas which sighted three U-Boats and attacked two of them. One of them did not meet the convoy, being then about 300 miles south-west of Iceland. Three further sightings, all attacked, were made by seven Hudsons on sweeps. No ships were afterwards sunk from this convoy.

The next major action was on the Convoys HX.237 and SC.129. On the 13th, four V.L.R. Liberators of 86 Squadron were sent to escort HX.237—then about 800 miles south-west of the aircrafts' base. None of them found the convoy, but five U-Boats were sighted and three were attacked. No ships were sunk actually from convoy on the 12th, though two stragglers were sunk during the day and one during the preceding night.

Next day, escort was given by three Sunderlands and one more which did not meet. No U-Boats were sighted by these aircraft, nor on any of the latter days. Meanwhile, SC.129, which had lost two ships on the 12th, and was following behind, was protected by a Liberator during the evening of the 13th, which sighted two U-Boats and attacked both of them. The convoy was then almost 1,200 miles from base. Next day, three more Liberators were with the convoy, from 1440 hours to midnight. Two U-Boats were

sighted and both were attacked. No further sightings were made on this convoy, in spite of almost constant day escort. On the 14th also, U-Boats seem to have collected round ONS.7, about 300 miles south-west of Iceland. This convoy was escorted by six U.S.N. Catalinas and a Liberator which sighted six U-Boats and attacked five of them. Three Fortresses, on sweeps, sighted nothing. The convoy was also escorted on the 15th and 16th, but no U-Boats were seen. However, one ship was sunk on the night of 16th/17th.

The heaviest attack on a convoy in the Coastal Command area, that on SC.130, began on the 19th. U-Boats had collected around this convoy and on the 19th, escort was given by four Liberators, from 0817 hours, to past midnight. No less than 15 sightings were made, leading to five D.C. attacks. Another four Liberators gave escort right through the night and continuously throughout the 20th, except for a short gap of 2½ hours. On the 20th, 11 more sightings were made and five more attacks. Escort was kept up continuously throughout the night of the 20th, two U-Boats being sighted at night, both of which dived too soon for attack. On the 21st, the convoy was escorted by four Sunderlands. Three further Sunderlands and six Fortresses were on a sweep around it, but no more U-Boats were seen, on either this or the subsequent days, in spite of the heavy air support.

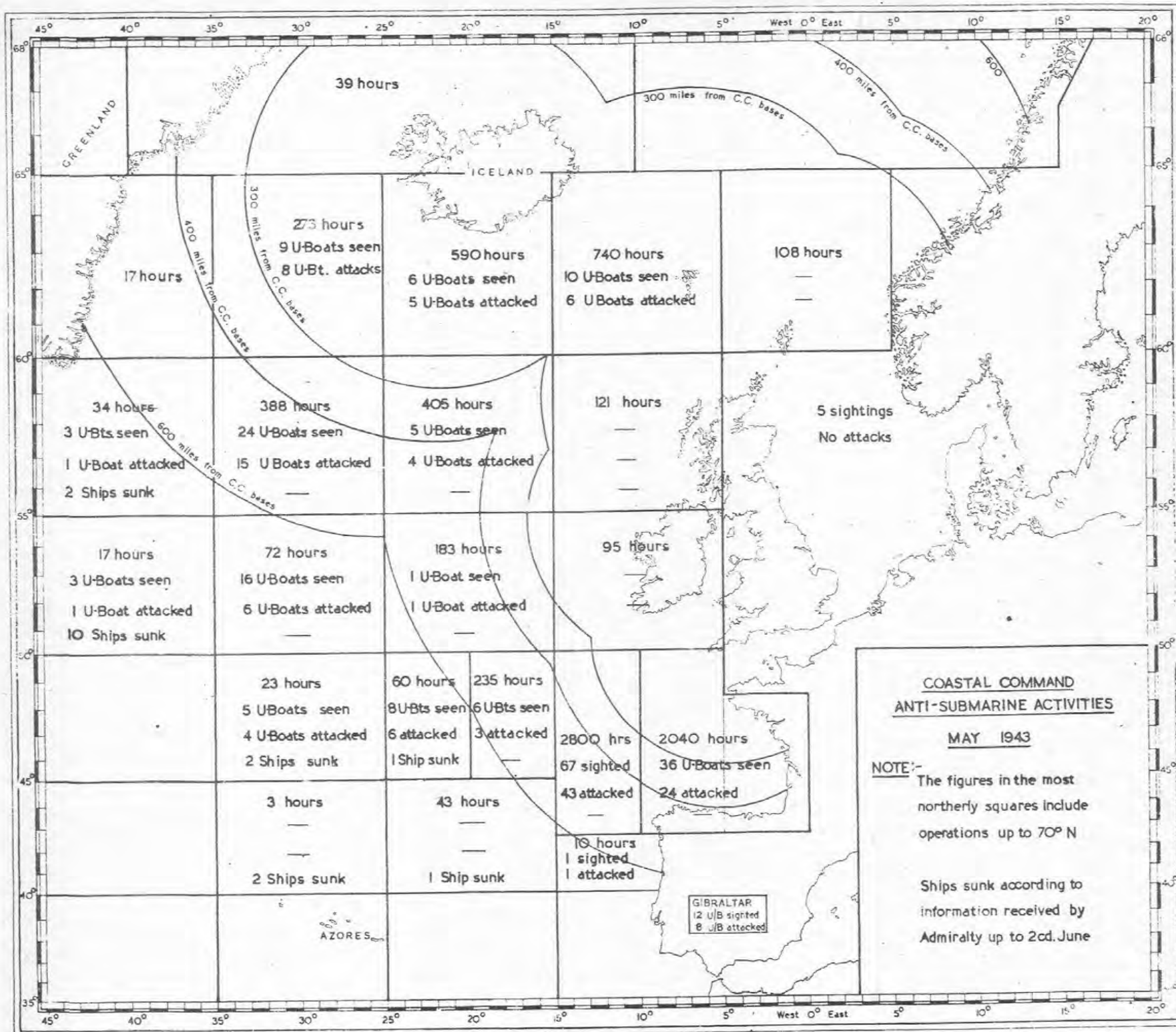
During the whole of this action, in which 29 sightings and 10 attacks were made, no single ship was sunk.

On the 23rd, HX.239 was picked up and four Liberators on escort and three Sunderlands on a sweep were sent to its support. Four U-Boats were sighted and two attacked. No more trouble was experienced by this convoy. Finally, SC.131 was probably picked up on the 26th. Five Liberators made two sightings and one attack, which seems to have broken off this attack as well.

Operations round convoys led in all to 83 sightings and 52 attacks. This large number was actually surpassed by the results of the Bay offensive—98 sightings, leading to 66 attacks, which corresponds to something like half the U-Boats crossing being attacked by our aircraft.

During April the operations in the Bay of searchlight Wellingtons (resulting in 21 sightings and 12 attacks) were obtained at the rate of one sighting for roughly every six sorties. Since the first week in May their results by night have fallen almost to nothing, and the day results have greatly increased. It is therefore clear that the searchlight successes coupled with the "terror value" of such attacks has led to the U-Boats doing all their surface charging by day. With more day flying this will presumably change back once more.

From such a large number of successes it is perhaps invidious to take any example, but the operations on the last day of the month show clearly the value of successful follow-ups. A



Halifax R/58 sighted a U-Boat and attacked it twice with depth-charges. Eighty minutes later another Halifax, J/58, arrived and again attacked the U-Boat twice (at 1718 hours). This attack was followed up by two Sunderlands, after whose attacks the U-Boat's crew were seen swimming in the water.

Finally, 15 sightings and nine attacks were made, both in the northern passage and in the Atlantic, on U-Boats which, judging by their courses and positions, were probably "new boys" making out into the Atlantic. The absence of night in these waters should enable higher results to be obtained in the near future.

U-BOAT SIGHTINGS AND ATTACKS BY SQUADRONS AND STATIONS

							<i>Sightings.</i>	<i>Attacks.</i>
172	S/Light Wellingtons	..	Chivenor	..	..	..	3	2
407	S/Light Wellingtons	..	Chivenor	..	..	..	2	1
502	Halifaxes	..	St. Eval	..	..	..	9	6
58	Halifaxes	..	St. Eval	..	..	..	15	13
10	(OTU) Whitleys	..	St. Eval	..	..	..	21	18
612	Whitleys	..	Talbenny	..	..	..	7	4
10	(R.A.A.F.) Sunderlands	..	Mt. Batten	..	..	..	13	5
461	Sunderlands	..	Hamworthy	..	..	..	9	3
224	Liberators	..	Beaulieu	..	..	..	13	10
59	Liberators	..	Aldergrove	..	..	..	5	3
236	Beaufighters	..	Predannock	..	..	..	1	1
311	(Czech) Wellingtons	..	Talbenny	..	..	..	2	1
210	Catalinas	..	Pembroke Dock	..	..	..	1	1
423	Sunderlands	..	Castle Archdale	..	..	..	3	3
201	Sunderlands	..	Castle Archdale	..	..	..	1	1
228	Sunderlands	..	Pembroke Dock	..	..	..	2	0
120	Liberators	..	Aldergrove and Iceland	..	..	..	28	11
86	Liberators	..	Aldergrove	..	..	..	18	11
206	Fortresses	..	Benbecula and St. Eval	..	..	..	3	2
333	(Norwegian) Catalinas	..	Woodhaven	..	..	..	5	0
190	Catalinas	..	Sullom Voe	..	..	..	3	3
84	(USN) Catalinas	..	Iceland	..	..	..	14	13
269	Hudsons	..	Iceland	..	..	..	19	15
489	Hampdens	..	Wick	..	..	..	2	0
248	Beaufighters	..	Dyce	..	..	..	1	0
1,404	Met. a/c	..	St. Eval	..	..	..	1	1
	P.R.U.	..	..	..	..	..	1	-0
							202	128
	(ii) From Gibraltar.							
202	Catalinas	..	..	..	..	..	3	2
233	Hudsons	..	..	..	..	..	5	5
179	S/Light Wellingtons	..	..	..	..	..	3	1
							11	8
	Chance sightings by Transit a/c (Two near Gibraltar, two in the Bay).						4	0
							217	136

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	..	..	..	..	..	57	52
Independents	..	..	..	..	..	62	1

This shipping protection was given by 472 sorties divided as follows :—

<i>Type of Shipping.</i>				<i>Escorts.</i>		<i>Protective Sweeps.</i>
				<i>Met.</i>	<i>Failed to meet.</i>	
Convoys and Naval Forces	..	..	..	234	52	184
Independents	..	..	..	2	0	

Analysis of Operations

The following table analyses U-Boat sightings in terms of the different types of duty engaged in by aircraft and the average duration of the sorties in the area of operations (excluding Gibraltar) :—

	All A/S Escorts.	Offensive Operations.			Chance.	Total on A/S patrol.
		Round C/V tracks.	Bay of Biscay.	Elsewhere (Atlantic and Northern passage).		
U-Boats :—						
Sighted	63	20	98	16	5	197
Attacked	34	18	66	10	—	128
Sorties	288	184	740	240	—	1,452
Average number of sorties per sighting	4½	9	7½	15	—	7·3
Hours actually on patrol	1,111	978	4,950	1,451	—	8,490
Average duration of sorties (actual on patrol)	3¼ hrs.	5¼ hrs.	6¾ hrs.	6 hrs.	—	6 hrs.

Recent Attacks on Submarines

The following accounts of attacks on enemy submarines made in April were not assessed in time to be printed in the last number of the Review. The attacks were so numerous that it is impossible to report more than a selection of some of the more interesting reports.

“Well executed attack”

At 0929 hours on April 5, **Hudson III, L/233** was on anti-submarine patrol, flying on track 255° at 3,500 ft., in weather 4/10 cloud, base 2,000 ft., 2/10 cloud at 10,000 ft., with sea slight, visibility 15–20 miles, when a U-Boat was sighted on the surface dead ahead, distant 3 miles. It was in position 27° 47' N., 15° 00' W., course 220°, 6 knots. The U-Boat was German, with three guns mounted, one 3-in. on foredeck, single action, one double action gun on the conning-tower and one 3-in. gun on the after deck, single action. The pilot immediately dived through the cloud, out of the sun, intending to attack across track from the port side. The U-Boat remained on the surface and engaged the aircraft with three guns. The pilot took evasive action and, after passing over the track of the U-Boat and ahead of it, the U-Boat began to submerge, altering course 20° to port before diving. The pilot made a turn of 360° and attacked from the U-Boat's port quarter at 35° to track. As the U-Boat altered course, this developed into a beam attack. Four Mark XI Torpex depth-charges were released from 50 ft., set to shallow depth, spaced 160 ft. actual, while the stern of the U-Boat was still visible. Evidence states that the depth-charges exploded 60 ft. ahead of the curved track of the U-Boat.

Between 2 and 3 minutes after the attack, two large oil patches were observed, 200 yards across and coloured deep blue to black, with violent bubbling in the centre. The aircraft remained in the vicinity for 35 minutes and at 1001 hours, set course for base.

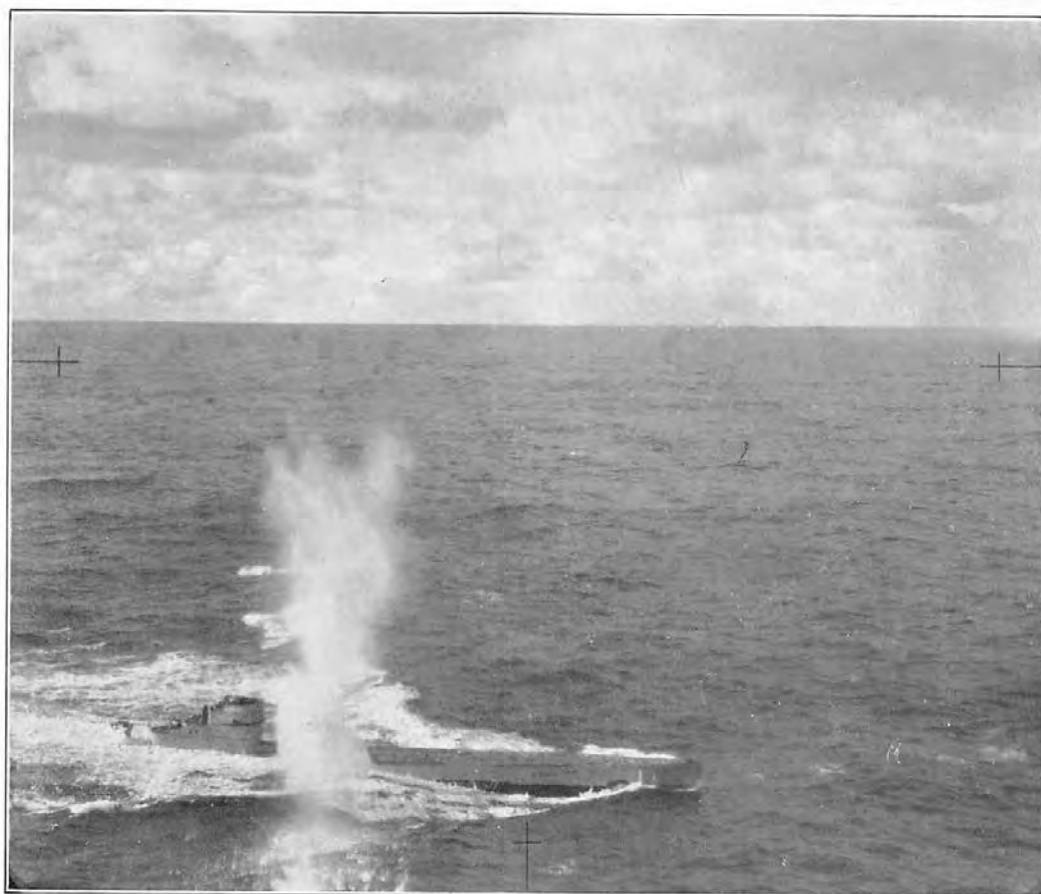
Result

A very well executed attack which appears to have damaged the U-Boat. This U-Boat was attacked by W/233 at 1658 hours (see next report) and showed a marked disinclination to dive, which seems to confirm that fairly serious damage had already been inflicted.

“An accurate attack” on the same U-Boat

At 1658 hours on April 5, **Hudson W/233** was on anti-submarine patrol in a probability area, flying on track 250° at 5,000 ft., in weather 5/10–6/10 cloud, base 1,200 ft., tops 1,800 ft., sea slight, visibility 15 miles, but with some haze, when a passenger, a French officer, sighted a U-Boat on the surface, apparently the same U-Boat as was damaged by Hudson L/233 on the same day. It was bearing Green 70°, distant 6 miles in position 27° 40' N., 15° 20' W., course 230°, 8–10 knots. The U-Boat was of the large German type, with main guns forward and aft of the conning-tower. The cannon on the after end of the conning-tower was painted medium grey. The pilot immediately turned to starboard to come up astern and dive to attack. Meanwhile, the U-Boat had shown a pale blue flare and, as the aircraft approached it, it started to turn to port. The aircraft did likewise so as to keep astern. The U-Boat made no attempt to dive or to reply to the aircraft's front gun, which fired about 300 rounds, obtaining numerous hits on and around the conning-tower. The attack was made from the U-Boat's port quarter, at 30° to track, releasing from 50 ft. four Mark XI Torpex depth-charges, set to shallow depth and spaced to 100 ft., while the U-Boat was still on the surface.

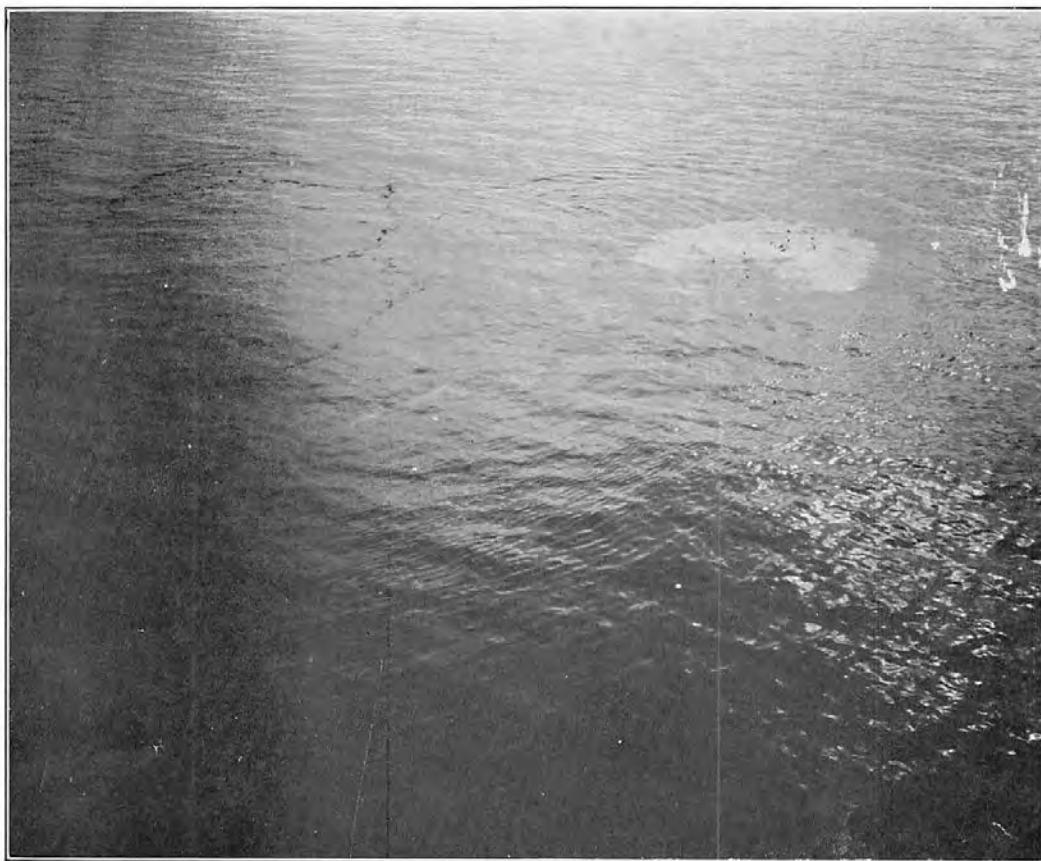
The evidence of the rear gunner stated that the stick straddled, two explosions being to port and abaft the conning-tower and two more to starboard of the conning-tower. The aircraft turned away to starboard and as the U-Boat was still on the surface, when the spray had subsided, a run was made with an anti-submarine bomb. Before the aircraft was in position, however, the U-Boat submerged quite slowly. One 100 lb. anti-submarine bomb, .04 seconds delay, was released from 800 ft., about 6 seconds after the U-Boat had gone below the surface but while it was still visible under the water.



The ambition of every pilot : Attack on U-Boat by V/120 on April 23.



Evasive tactics of U-Boat attacked by 461 Squadron on April 24.



Oil patch which appeared after attack on U-Boat by D/224 on April 29.



Debris in oil patch following the same attack by D/224.

The bomb exploded off the starboard quarter of the submerged U-Boat. During the circuit after the depth-charge attack, the whole crew noticed an oil streak which began at the edge of the depth-charge explosion mark and gradually spread from the position of the U-Boat.

After the bomb explosion, the whole crew noticed a large, bright green patch, several square yards in size, which dissipated before they could make closer inspection. But it appeared to be large air bubbles. This was close to the position of the submerged U-Boat. The aircraft continued to circle to port but, apart from the increase in the oil patch to 400 yards by 50 yards, nothing fresh transpired and at 1712 hours the aircraft set course for base.

Result

A very good and, from visual evidence, an accurate attack. The after results indicated that damage was inflicted but it is difficult to assess to what degree.

Escorting HX 231

At 1553 hours on April 5, **Liberator III, N/120**, was on anti-submarine escort to HX 231. While approaching the convoy, flying on track 182°, at 1,800 ft., in weather 10/10 cloud, base 3,000 ft., sea calm, visibility 10 miles, with sea haze, a U-Boat was sighted on the surface, bearing Green 60°, distant three miles, in position 58° 20' N., 31° 52' W., course 090°, six knots. This position was 015°, 10 miles from HX 231. S/E was switched on at the time of the sighting, but no blip was obtained. The U-Boat was of the 517-ton type, light blue in colour, resembling duck egg blue camouflage. Jumping wires were not seen, but they were visible on photograph No. 5731. Four men were seen in the conning-tower.

The aircraft turned to starboard and, diving out of the sun, it attacked 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 100 ft., while the U-Boat was still on the surface. The engineer, looking through the bomb doors, saw a big splash as the depth-charges entered the water alongside the conning-tower which was obscured by the spray. The aircraft continued on straight course for approximately 30 seconds to allow the mirror camera to operate successfully. The rear gunner stated that the U-Boat was surrounded by a flurry of water from the depth-charges entering the water and that it was subsequently obscured by the explosions. The aircraft then turned to port and circled the scene of the attack which was marked by depth-charge scum and the explosion mark.

Evidence states that four depth-charges appeared to explode on the track ahead of the U-Boat and two appeared to explode close to the U-Boat's starboard beam. No after effects were observed. Three marine markers were dropped on the scene of the attack and one on the U-Boat's track. The aircraft reported details of the attack to the S.N.O. by R/T ten minutes after, and was informed that a destroyer had been sent to the scene. The aircraft then proceeded to the assistance of the convoy and carried out instructions of the S.N.O. and was therefore unable to return to the scene.

(C49053)

Result

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

A Model Approach

At 2246 hours on April 10, **Searchlight Wellington C/172** was flying on track 214° at 2,500 ft., in weather 10/10 cloud, base 2,800 ft., sea calm, visibility good. It had obtained S/E contact at 2241 hours, 15° to port, range six miles. The aircraft made an almost complete turn to starboard and homed on track 195°, losing height to 600 ft. At three-quarter mile the searchlight was switched on, illuminating the U-Boat on the surface, slightly to starboard, in position 46° 48' N., 09° 00' W., course 275°, approximately six knots. No wake was visible. The U-Boat was not observed sufficiently to give details, but it was believed to be of the 517-ton type. The aircraft turned slightly to starboard and attacked from the U-Boat's starboard quarter, at an angle of 70° to track, releasing from 40 ft., six Mark XI Torpex, depth-charges, set to shallow depth, spaced 100 ft., while the U-Boat was still fully surfaced. Evidence states that the stick straddled the U-Boat, the first explosion taking place close on starboard side of the hull and two explosions on the port side. These were the only three explosions observed by the rear gunner. The aircraft flew on for 10-15 seconds and then back over the flame floats, with the searchlight off. Nothing further was seen and no contacts were obtained. A sea-marker was dropped and nine minutes after the attack the aircraft resumed patrol.

Result

A model approach and a very good attack. It must be disappointing for 172 Squadron crews scarcely ever to be able to see bits and pieces afterwards but, with rare exceptions, they must rest content with the knowledge that the searchlight night attack is the thing most dreaded and feared by the U-Boat service. This has come about only from the heavy casualties inflicted on them by this form of attack. But it is generally impossible to credit individual attacks with a precise and accurate assessment of the result.

"A Very Good Day's Work"

At 1310 hours on April 21, **Catalina IB, V/190** was on anti-submarine patrol, flying on track 219° at 3,000 ft., in weather 4/10 cloud, base 3,500 ft., sea moderate, visibility 15-20 miles, when it sighted a U-Boat on the surface, bearing 250° T., distant 15 miles, in position 63° 45' N., 09° 15' W., course 230°, 8-10 knots. The U-Boat was of the 517-ton type, green-grey in colour, with one anti-shiping gun forward of the conning-tower, and twin A/A gun mounted in the bandstand at the rear of the conning-tower. Three men were observed on the conning-tower. The aircraft attacked from the U-Boat's port quarter at 30° to track, releasing from 50 ft., one Mark XI Torpex depth-charge, set to shallow depth, while the U-Boat was still fully surfaced. Three depth-charges failed to release.

Evidence states that the one depth-charge which did release, exploded on the U-Boat's port beam, 25-30 ft. from the U-Boat. The aircraft

made a steep turn and attacked again from the U-Boat's port bow, at 30° to track, releasing from 50 ft., three Mark XI, Torpex depth-charges, set to shallow depth, spaced 100 ft., less than five seconds after the U-Boat disappeared. Evidence states that the stick straddled the U-Boat's swirl, two depth-charges falling short and one over the swirl. About two to three minutes after the explosions had subsided, oil and air bubbles were observed. The oil patch was 80-100 ft. wide and about 200 yards long, with air bubbles in a solid white mass at the end of the patch. This oil followed the wake of the U-Boat for about 200 yards and it appeared as if the U-Boat had altered course approximately 90° to starboard.

The aircraft circled for 15 minutes and then set course on baiting procedure, returning to the scene of the attack at 1500 hours. It then began a square search, using 5 miles visibility. At 1644 hours, while flying at 2,500 ft., in similar weather conditions, it sighted a U-Boat on the surface bearing 315° T., distant 10 miles, in position 63° 29' N., 09° 50' W., course 045°, 8 knots. The state of the sea made it impossible to observe details of the U-Boat, which crash dived and left an oil patch 100-200 ft. long and 100 ft. wide. The aircraft did not attack as the U-Boat had submerged for too long, but photographs were taken of the oil streaks. The aircraft resumed patrol.

Result : 1st Attack

A good attack partially ruined by hang up of three depth-charges. The fourth depth-charge, from photographic analysis, exploded very close, possibly within 20 ft. of the U-Boat's side and, from the after results, it is thought that the U-Boat was damaged.

Analysis : 2nd Attack

Interval 3 seconds + 2 seconds time of flight + 3 seconds to reach depth = 8 seconds. During this time the conning-tower advanced 80 ft. from the apex of the swirl. Photographs reveal that the stick under shot with the last depth-charge only possibly within damage range.

Result : 2nd Attack

Possibly slight increase in damage inflicted by first attack. Photographs show clearly the patch of oil with a mass of air at the head. The second U-Boat, seen at 1644 hours, seems to have been damaged, judging from the amount of oil left behind on diving. It is just possible that it was the same U-Boat on its way back to base, in a damaged condition. A very good day's work by this aircraft.

A possible kill

At 1757 hours on April 22, **Halifax II, E/58**, was on anti-submarine patrol, flying on track 360° at 5,500 ft., above 5/10 cloud, sea slight swell, visibility 10 miles, when it sighted a wake, bearing Red 90°, distant 1-2 miles. The aircraft circled 180° to port and almost immediately, the wake was seen to be caused by a U-Boat on the surface, on a westerly course, 10-12 knots, with a second U-Boat about 3 miles dead ahead, also on a westerly course, 10-12 knots, in position 45° 05' N., 08° 30' W. The crew were not able to describe the U-Boats. The aircraft continued on southerly course, losing height as quickly as

possible and then altered course to starboard, circling again to starboard and once more to port, in "S" turn, back on to westerly course. The aircraft was still much too high to attack the nearest and most easterly of the U-Boats, which was still surfaced, so it continued diving towards the leading U-Boat, from astern. The aircraft attacked from fine on U-Boat's starboard quarter, releasing from 50 ft., six Mark XI, Torpex depth-charges, set to shallow depth, spaced 140-150 ft. actual, 12-17 seconds after the U-Boat had disappeared. The mid-upper gunner saw the splash of the first depth-charge entering the water about half width of swirl, dead ahead of the swirl. He and the rear gunner reported that the whole stick appeared to explode along the track, ahead of the swirl. The aircraft immediately circled to port and back over the scene of the attack. But only the explosion mark was seen, completely obliterating the swirl. The aircraft circled until 1812 hours when a marine marker was dropped on the still visible explosion mark. The aircraft set course on track 267°, up sun, on baiting procedure. At 1825 hours, it turned on to reciprocal and set course back to the scene. Several patches of very bad weather were met and, at 1825 hours, when flying in heavy rain, 10/10 cloud down to sea level in places, with visibility 1,000-2,000 yards, the captain decided to abandon the search and he altered course on to homeward track of 360°.

At 1846 hours, while flying on track 360°, at 300 ft., in the base of low stratus, a U-Boat was sighted on the surface, bearing Red 45°, distant 1 mile, with the second U-Boat on the starboard bow, distant 1 mile to east of first U-Boat, in position 45° 05' N., 08° 21' W. The second and more easterly U-Boat was on course 270°, 6-8 knots. About 1-2 miles south-east of the first U-Boat, the depth-charge explosion mark of the first attack was seen. The second U-Boat was showing a definite wake while the first one was hardly moving. A very faint circular track was visible and the U-Boat appeared to be lying on north-east heading. The pilot circled to attack through 180° and attacked from the U-Boat's port beam, releasing from 50 ft., three Mark XI Torpex depth-charges, same settings, spaced 130-135 ft. actual 3-5 seconds (estimated) after the conning tower had disappeared. The U-Boat did not appear to dive under power and practically no swirl was left; only a couple of wide, concentric ripples. Evidence states that the depth-charges were seen to explode across these ripples, and plumes were seen to be black, in contrast to the white plumes of the previous attack. The tail of the aircraft was lifted by the force of the depth charge explosions and the pilot only just prevented it from hitting the water. Nothing further was seen owing to the heavy rain and the poor visibility. The pilot decided not to search any longer and set course for base at 1850 hours.

Analysis : 1st Attack

Interval 14 seconds + 2 seconds time of flight + 3 seconds to reach depth = 19 seconds. During this time the conning-tower advanced 190 ft. from the apex of the swirl.

Result

A very good attack after close sighting from 5,400 ft. The stick straddled the length of the U-Boat and serious damage was inflicted, causing

subsequent re-surface in a semi-crippled condition. Good bailing tactics were suitably rewarded, as they provided opportunity which was taken advantage of in a further very good attack.

Analysis: 2nd Attack

It is impossible to estimate how far the conning-tower advanced in the 4 seconds + 2 seconds time of flight + 3 seconds to reach depth, but if evidence is correct as regards the lack of forward movement, it probably dived slow on motors and the advance may have been only 40 ft. or so. In this case, the stick may have straddled between the conning-tower and the stern.

Result

Very good navigation to re-locate the two U-Boats, in bad visibility. Good team work in the aircraft and a second very good attack, choosing the previously damaged U-Boat. An excellent day's work. It is not possible on the evidence to assess how much further damage was inflicted, but it is possible that the U-Boat was killed.

Escorting HX 234. "U-Boat destroyed" ^{U 189} _(lost with many)

At 2105 hours on April 23, **Liberator III V/120**, was on anti-submarine escort to HX.234, and while carrying out patrol as ordered by the S.N.O., by R/T, flying in weather 6/10 cloud, base 3,500 ft., sea moderate, visibility 25 miles, wind 240°, 23 knots, a U-Boat was sighted on the surface, bearing 120° T., distant 16 miles, in position 59° 48' N., 34° 48' W., course and speed not given. The aircraft was over the U-Boat swirl six minutes after it was first sighted. The U-Boat was then, of course, completely submerged. At 2103 hours, when flying on track 320° at 3,000 ft., in similar weather conditions, two U-Boats were sighted on the surface, bearing 240°, distant 4 miles, and 210°, distant 8 miles, respectively, in position 59° 50' N., 34° 43' W., course 080°, 14 knots. This position was 320°, 32 miles from the convoy. The aircraft decided to attack the nearer U-Boat which was of the large 700-ton type, white in colour, with a light blue conning-tower. There were two guns, one forward and one aft of the conning-tower. The aircraft attacked from the U-Boat's port quarter, at 60° to track, releasing from 50 ft., four Mark X Torpex depth-charges, set to shallow depth, spaced 100 ft., while the U-Boat was still fully surfaced.

Evidence states that the depth-charges straddled the U-Boat, one being to starboard and three to port. The nearest depth-charge on the starboard side was 75 feet from the U-Boat and the nearest on the port side was 25 ft. from the U-Boat. During the approach, the U-Boat opened fire from the gun aft of the conning-tower, but the fire ceased after the explosion of the first depth-charge. After the first attack, the U-Boat was stopped and had slewed 90° to port.

One minute later, the aircraft made a second attack from the U-Boat's starboard bow, at 70° to track, releasing from 50 ft., two Mark XI Torpex depth-charges, set to shallow depth, spaced 100 ft., while the U-boat was on the surface but down by the stern.

Evidence states that the depth-charges exploded very close to the U-Boat, lifting the stern out of the water. The U-Boat was abandoned and approximately 50 bodies were seen in the water, some wearing life-jackets and others clinging to a

long cylindrical object, whitish in colour and 20 ft. by 3½ ft. The aircraft remained in the area for 32 minutes, having contacted the S.N.O. and reporting the attack by R/T. The S.N.O. replied that he could not spare an escort vessel to come to the scene of the attack. At 2137 hours the aircraft set course for base.

Result

Excellent attack in face of flak, and perfect placing of depth-charges on the two runs. The U-Boat was destroyed. The U-Boat was a 750-tonner, fitted with the extra gun platform abaft the ordinary handstand. This is the first photograph we have had of this at sea. In March, P.R.U. secured a photograph at Stettin showing one of these 750-tonners fitted out with the extra gun platform. Excellent photographs which confirm the circumstantial evidence. The cylindrical object to which many of the crew were clinging was probably one of the upper deck containers in which spare air torpedoes may be carried but which, in the North Atlantic, are often empty. Two other recent attacks have produced one or more of these. (See Plate 2.)

Scott J K Hoff A.T.

"A Most Unusual Sighting"

At 2330 B hours on April 25, **U.S.N. Catalina E/84** was also escorting HX.234 and while flying on track 000° at 1,200 ft., in weather 9/10-10/10 cloud, base 2,000 ft., sea rough, visibility reduced to 2 miles by darkness, wind 310° 30 knots, when a U-Boat was sighted on the surface, bearing Red 20°, distant 1,200 ft., in position 60° 30' N., 22° 40' W., course 225°, 6 knots. S/E was not on. This position was 340°, 105 miles from HX.234, and 180°, 50 miles from ONS J 5.

The attention of the aircraft was attracted to the U-Boat by tracer fire directed towards the aircraft from the U-Boat. After sighting, the aircraft turned to starboard to offer greater deflection shot to the U-Boat. At about 1 mile the U-Boat was thought to be diving and the firing stopped. The aircraft turned to port to attack, firing a test first from the fixed gun. The U-Boat resumed fire and the aircraft continued firing, scoring hits on the deck and conning-tower and eventually silencing the U-Boat's fire.

The aircraft attacked from the U-Boat's port quarter, at 15° to track, releasing from 70 ft. four 320-lb. Torpex depth bombs, set to shallow depth, while the after part of the U-Boat was still visible. The conning-tower and forward part of the deck were awash. Evidence states that the bombs fell parallel with the U-Boat, exploding 30-35 ft. to port. The explosions caused the U-Boat to rise in the water and rock back and forth. The most violent roll was about 45°. At the time of the release, two men were seen on the after deck, hurrying to the gun. But they were not seen again. The U-Boat had turned sharply to port while submerging, the stern appearing to settle before the bow. The aircraft searched the area for 12 minutes but, owing to the darkness, nothing could be seen.

Result

A most unusual sighting. Quick action by the surprised aircraft brought off a very good attack. It is impossible to say what damage was inflicted, but the U-Boat must have received a very severe shake up, at the least. No bomb spacing distance is given.

Coup de grâce by two Sunderlands

At 0928 hours on April 29 **Sunderland III F/10**, was on anti-shipping patrol, flying in weather 10/10ths cloud, base 3,000 ft., sea calm with swell, visibility 15 miles, wind 010°, 6 knots, when it sighted a U-Boat on the surface on the starboard bow, distance 6 miles, in position 44° 30' N., 11° 01' W., course 100°, 6 knots. The aircraft arrived over the position too late to attack. It waited in the neighbourhood for over half an hour in the hope that the U-Boat would reappear. It finally gave up and continued patrol. At 1102 hours, flying on track 070° at 1,600 ft., in similar weather conditions, a smoke float was sighted. The aircraft investigated and then sighted the periscope of a U-Boat in the act of surfacing, bearing 090°, T, distant 2½ miles, in position 45° 15' N., 11° 50' W., course 070°, 2 knots. S/E was switched off. The U-Boat was of the 740-ton type, blue-black in colour. There was a 4-in. gun forward and several light A.A. guns on the conning-tower and immediately abaft. The U-Boat opened fire. The aircraft attacked from the U-Boat's port quarter at 20° to track, releasing from 50 to 70 ft. six Mark VIII Torpex depth-charges, Mark XVI pistol, set to shallow depth, spaced slightly less than 100 ft. actual, while the U-Boat was still on the surface.

Evidence states that the depth-charges straddled the U-Boat, with No. 2 close on the port side. The U-Boat fired during the attack, registering hits on the aircraft. The U-Boat turned to port, making an "S" turn and then making a complete circle to port. It continued to fire throughout, and while the aircraft climbed to make a bombing attack. Immediately after the depth-charge explosions, an oil streak was seen and then blue and black smoke.

Aircraft P/461 then appeared on the scene and the U-Boat's fire was diverted to this aircraft. "P" carried out a depth-charge attack, straddling the U-Boat. It was observed to sink horizontally and then the stern emerged and disappeared vertically. One or two men were seen struggling in the water. The aircraft remained in the vicinity for 30 minutes and then, having reached P.L.E., set course for base.

The **Sunderland III, P/461**, which joined F/10 in the above attack was on operation, flying in weather 10/10ths cloud, base 2,800 ft., sea calm with swell, visibility 12-15 miles, wind 270° 10 m.p.h. when it sighted, at 1040 hours, the conning-tower and a good portion of the deck of a U-Boat, in position 45° 16' N., 11° 31' W., course 090°, 12 knots. The U-Boat submerged before the aircraft could attack, so a flame float, an aluminium sea marker and a marine sea marker were dropped 11 minutes later. The aircraft then began baiting tactics. At 1109 hours the aircraft intercepted a message from F/10, reporting the attack on the U-Boat. "P" set course for the position and when flying on track 313° at 2,700 ft., in similar weather conditions, it sighted the U-Boat on the surface, bearing Green 60°, distant 5 miles, in position 45° 12' N., 11° 30' W., course 090°, speed unknown. S/E was switched off. The U-Boat opened fire on the aircraft which attacked from its starboard quarter at 30° to track, releasing from 100-15 ft. six Mark XI Torpex depth-charges, Mark XVI pistol, set to

shallow depth, spaced 100 ft., while the U-Boat was on the surface. It was zigzagging but the bows appeared to be down.

Evidence states that the depth-charges straddled the U-Boat. This is confirmed by the photographs.

The U-Boat started sinking nearly horizontal, but it soon developed an angle bow down. Finally, the stern rose more and more until the conning-tower disappeared with the stern up at a very steep angle and with little or no forward movement. The stern finally disappeared in a smother of foam. Two minutes later large air bubbles began appearing from a point about 200 ft. ahead of where the stern had disappeared and just clear of the explosion mark. These bubbles formed four or five circles, separate but touching, of a total length of 200 ft. They continued to boil up for five minutes in the same position, without advancing, and they finally eased off and petered out.

Result

An excellent attack in the face of flak with depth-charges accurately placed across a violently zig-zagging U-Boat. A very good set of photographs confirming attack and many of the details visually reported after the attack. Together with F/10 this attack very seriously damaged if not destroyed the U-Boat.

Result : F/10's attack

An excellent attack by F/10, carried out in face of flak. The U-Boat sustained enough damage to the pressure hull to prevent it from diving and in due course the coup de grâce was administered by P/461.

U-Boat foundered

At 0955 hours on April 30, **Hampden X/455** was on anti-submarine patrol, flying on track 320°, at 1,000 ft., in weather 10/10 cloud, base 1,000 ft., sea rough, visibility 5 miles, when it sighted a U-Boat on the surface, bearing Green 45°, distant 1½ miles, in position 64° 05' N., 06° 40' W., course 230°, speed slight, probably owing to the heavy seas. The U-Boat had a German type conning-tower, with gun forward, machine-gun on the conning-tower and an Oerlikon on a turntable aft of the conning-tower. The U-Boat was of the 517-ton class. The U-Boat did not attempt to dive, but opened fire with both guns at 600 yards. The aircraft attacked down the U-Boat's track, releasing from 50 ft. six Mark XI Torpex depth-charges, set to shallow depth, spaced 95-100 ft., while the U-Boat was still on the surface. Evidence states that the depth-charges exploded on the track, three astern and three on the starboard side of the bows. The U-Boat continued firing and men could be seen manning the guns. The stern of the U-Boat rose 10 ft. out of the water, then fell to surface and the boat listed 20° to port.

The aircraft made a second attack from the U-Boat's starboard beam, at 90° to track, releasing from 50 ft. two Mark XI Torpex depth-charges, same settings, while the U-Boat was still on the surface. Evidence states that the depth charges straddled the U-Boat's bows, one 10 ft.

on the starboard bow and the other 70 ft. on the port bow. After the attack the stern was seen to rise steeply out of the water and then sink back as the U-Boat slithered under. Smoke was seen from the bows of the U-Boat after the second attack. The aircraft circled again and on the third run over observed an oil patch 300 ft. across. About 30 men were seen in the water. The aircraft dropped a marine marker in the middle of the oil patch which was increasing in size. Red and yellow life-jackets were seen and what looked like a yellow dinghy. The aircraft was hit with six machine-gun bullets. After being over the scene for 14 minutes the aircraft continued patrol.

Result

First run.—It is not possible to determine the positions of the explosions from the photographs, but they do not conflict with the visual evidence, except that they were probably 40 ft. or more from the U-Boat's starboard side and therefore did not inflict much if any damage.

Second run.—Visual evidence is confirmed by the fact that the U-Boat foundered, leaving about 30 men swimming, together with an oil patch which is revealed in the photograph. An excellent shot with the last two depth-charges, under flak.

Trade Protection

Convoy HX.234

The following account of incidents in connection with a heavily threatened convoy has unfortunately had to be written without access to the report from the S.N.O. Escort, as this was not available at the time of going to press.

Convoy HX.234, made up of 42 ships, was met at daylight on Sunday, April 18, by Escort Group B.4, consisting of H.M.S. *Highlander* (S.O.), *Anemone*, *Abelia*, *Asphodel*, *Clover*, and *Pennywort*, supported by H.M.C.S. *Rosthern*. *Vimy* was delayed in sailing, but joined at 0630 on April 21 and provided a welcome reinforcement.

The convoy was in position 47° 42' N., 48° 02' W., steering 360°, having been directed to proceed as near as possible to the limit of ice. Numerous icebergs were sighted during the 18th and 19th and pack ice was seen on the western horizon.

Air cover was provided by a Catalina on the 18th and by a Catalina and Fortress on the 19th, but no U-Boats were reported. It was not until early on the 21st that the first submarine made contact.

First Sighting

At 0400 hours on the 21st, in position 56° 47' N., 47° 46' W., the convoy had just altered course to 074° when *Pennywort* got a R.D.F. contact on the starboard quarter, quickly followed by the sighting of a U-Boat. A depth-charge attack was made, but the results were inconclusive.

Up to this time no indications had been received that the convoy had been sighted and it is considered likely that this was a chance encounter by the submarine which was probably in the act of homing on to O.N.S.3, then some 80 miles to the south-east.

Nothing further happened until 1840 hours on the 21st, when a close contact was obtained on the starboard beam. An aircraft which had just arrived as escort was sent out to search. The aircraft was able to report a U-Boat bearing 170°, 20 miles from the convoy. Unfortunately, the depth-charges failed to release and in a subsequent hunt, *Vimy* failed to make contact.

First Attack

At 0021 hours on the 22nd, in very bad visibility, the first attack was made on the convoy when the M/V *Amerika* was sunk. No indications of U-Boats being near had been picked up prior to this attack. It was thought that this also

might have been a chance encounter with a U-Boat which was trying to locate O.N.179, then about 100 miles to the eastward.

Air cover was provided throughout the day by Liberators from Iceland which carried out patrols round the convoy. During the afternoon, it became clear that a pack of U-Boats was in the vicinity, and at 2030 hours an aircraft was ordered to search on the starboard beam. This produced immediate results. A submarine was reported 165°, 19 miles from the convoy. Then followed two further sightings, 180°, at 12 miles.

Second Attack

April 23 was a beautiful, fine day in the neighbourhood of the convoy, and in view of the number of submarines about it was unfortunate that weather in Iceland kept aircraft grounded until the afternoon.

A second attack was made at 1354 hours, while *Highlander* and *Vimy* were hunting a pair of U-Boats, well on the starboard beam. One ship was damaged but it was able to remain with the convoy. This attack appears to have been made from some distance, as the torpedo exploded on or near the surface without actually striking the ship.

Attacks by Aircraft

Aircraft arrived in the evening when two Liberators carried out a sweep and one provided close escort. Weather at base was so bad that two further sorties scheduled were cancelled. While sweeping round the convoy, J.120 made three sightings of U-Boats, all on the port side, and was able to get in an attack on one of them. The other two submerged before the aircraft was able to get into an attacking position.

While carrying out patrols round the convoy, V.120 also sighted three U-Boats: the first at a distance of 16 miles, in very good visibility. It was able to submerge before the aircraft arrived. The second and third were sighted at the same time and one of them was selected for attack.

This U-Boat appeared to be of the 700-ton type. It was painted white, with a light blue conning

tower. Four depth-charges were dropped in the first attack, from a height of 50 ft., while the U-Boat was still fully surfaced. A straddle was obtained, two charges falling on either side, and when the spray had subsided, the U-Boat was seen to be still on the surface but down by the stern. A second attack was made from 50 ft. with three depth-charges which fell very close and lifted the stern out of the water. The U-Boat was abandoned by the crew and seen to sink stern first. A full account of these attacks appears on page 9.

Effective work by these aircraft, combined with two attacks by *Rosthern* and *Pennywort*, on asdic contacts, set these submarines back and they were unable to gain bearing for a further attack.

April 24

Close escort was again provided by three aircraft on the 24th, from 0705 hours to 1725 hours, and eight U-Boat sightings were made, no less than seven of them by H.84. In the early afternoon, the captain of this aircraft sighted two partially submerged U-Boats and was able to attack one of them. Some time later, two further submarines were seen close to the position where the original pair had been sighted. They were forced to crash dive with machine gun fire, the only weapon left to the aircraft.

An hour later another U-Boat was sighted, followed by yet another ten minutes after. Both

of them were forced to dive by machine gun fire. If they were the same U-Boats in each case, as seems possible, they were probably very relieved when H.84 reached its P.L.E. and set course for base. This aircraft rounded off an excellent day's work by sighting yet another U-Boat and forcing it to crash dive, just before leaving the convoy area.

The weather deteriorated during the night, the wind increasing to gale force and visibility shutting down to 1,000 yards, with rain squalls and heavy cloud. This, combined with an emergency turn to 130° at 2200, and the good work by aircraft during the day, threw the pack off the scent. It appears that the U-Boats which were astern, trying to come up to windward, missed the turn, while those to starboard were unable to make appreciable headway into the sea.

The 4th Support Group reinforced the surface escort at 0800 hours on April 25 and, with aircraft providing cover during the day, no further U-Boats were encountered. Aircraft again escorted the convoy, on April 26, but no sightings were made and the convoy arrived in home waters without further incident.

The constant attacks during daylight on April 23 and 24 kept the U-Boats submerged, and they were thus forced far behind and were unable to get into attacking positions during the night.

Sea-Air Co-operation

The following article has been written by an Escort Group Commander. It raises points of interest to members of aircrews, working towards similar ends.

I heard rather a good story the other day. An N.O. turned to his host after dinner and remarked, "I'm a clever fellow." His host looked surprised (it had been quite a mild evening). "Oh yes," said the guest, "I know I'm a clever fellow, a man with brains; but only when I'm at the Admiralty. Now I've come to sea, and am trying to do the job, I've left my brains behind in the Admiralty. If ever I go back there I shall be a clever fellow again."

I myself have never been at the Admiralty, so cannot even make that modest claim, nor, I must confess, owing to some rather pressing engagements with Doenitz's underwater pests, have I been able to devote as much time to this article as I had hoped and the importance of the subject demands. All I can claim, as they used to say of the story books, is that these remarks are founded on facts, experienced in the North Atlantic during the past two years, and I hope they may provoke some useful discussion. So much for introduction and now for my brief.

Difficulties of an Escort Group Commander

These are easily summarized:—

- (a) Insufficient escorts.
- (b) Insufficient speed.
- (c) Insufficient endurance.

For all three the presence of air escort is invaluable. In the case of (a), an outer air patrol enables the surface escorts to be disposed to the best advantage to meet any situation developing.

In the case of (b), an aircraft can force a U-Boat down and pin him; thereby giving the surface escorts time to get up.

In the case of (c), oiling at sea can be carried out easily and expeditiously only in calm weather, and it is on such days, when visibility is extreme, that an outer patrol is of greatest value. The presence of aircraft whilst fuelling is an enormous relief to a Group Commander, and may even prevent some of us going down with grey hairs in sorrow to the grave with *fuel* written large across our hearts.

Convoy Protection

In a circular letter on this subject to my group, I compared convoy protection to a game of hockey, in which the surface escort filled the half and back positions and aircraft the forward. Just as in hockey a goal cannot be scored from outside the circle, so with a convoy a ship cannot be torpedoed from outside torpedo range. A 5,000-yard circle is therefore where the surface escorts should position themselves to meet a "combined" attack.

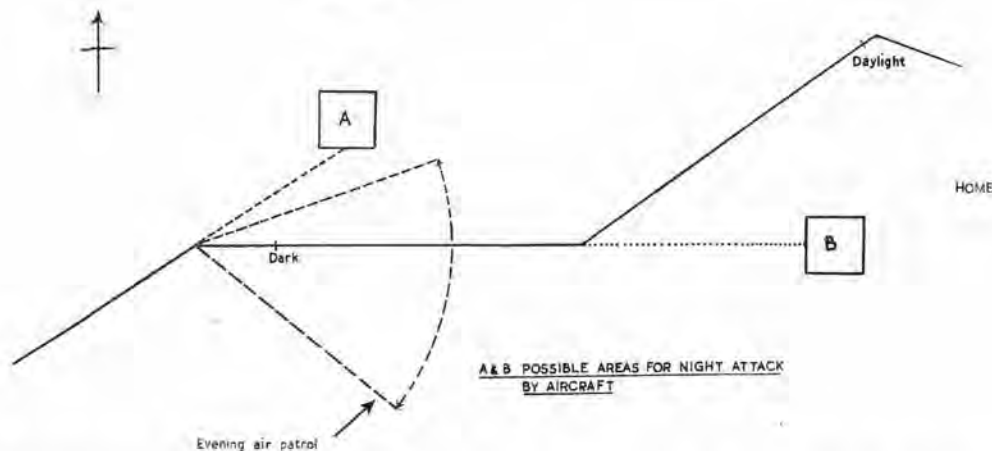
The primary function of the surface escorts is therefore defensive and it consists, as in hockey, in marking, *i.e.*, Station Keeping on the convoy, interception and tackling. As a general rule the earlier interception can be achieved and the tackle made, the better. But this depends on the defence being at least equal in speed to the opposition and one continuously has to guard against being drawn away to a flank, leaving the defence out of position and the circle unguarded. Here again one's lack of endurance is a big handicap as one must conserve fuel as much as possible.

Air escorts in my example were to take the place of forwards with the scoring against the enemy as their primary function; but in order to enable the best use to be made of the air escorts provided, it is essential that we should play as a team with good combination and mutual understanding.

Presumably every Group Commander has his own ideas on the best evasive action. Personally, I usually adopt one of two plans depending on the convoy's position, and the type of night one may expect.

The one I like best, if the night is not likely to be very dark and the position of the convoy permits, is to make a turn about an hour before dark, as if heading straight for home, or for our presumed destination. This to be followed about two hours after dark by a 30° turn away in the most unlikely direction. In this case I hope and expect the first turn to be observed whilst the second goes unobserved. Experience has suggested that it usually takes the U-Boats rather more than three hours to work up into position for a night attack, and I think that an aircraft in the area just beyond the second turn, on the mean line of advance of the first, might find several U-Boats on the surface looking for the convoy. (See Diagram 1.)

DIAGRAM 1



Our two main objects should be: (1) to feed the forwards, and (2) to back up the attack as far as our lack of speed and stamina will allow.

The first essential for (1) is good communications as, with the development of HF/DF, the amount of information available is often considerable.

Communications have improved enormously, especially in the last three or four months, and the Western Approaches Escort Code appears to furnish a quick and satisfactory method of dealing with this problem.

We have certainly advanced a long way since the day, now some two years ago, when a Hudson made to me "Unidentified Aircraft approaching from astern, I go!!"

It was probably just as well that he failed to receive my reply of "Brave Man" as on return to Iceland I discovered that he had intended to make "Relief Aircraft has arrived."

But, apart from just passing information, which may be likened to giving direct passes, I think much could be done in the way of making openings.

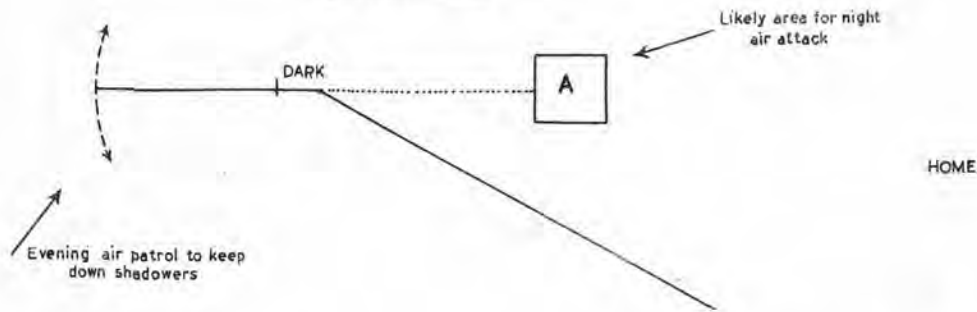
If it is planned to carry out evasive turns with the convoy at night, a very likely area for U-Boats to be in about 2½ to 3 hours later could, I think, be indicated to aircraft.

If conditions are unsuitable for the double evasive turn, then I make one, preferably just after dark, or as late as possible, without throwing the convoy into disorder.

In this case also, a happy hunting ground might be expected along the old line of advance. This certainly proved to be the case with one homeward bound convoy which was being reinforced from Iceland by an American destroyer. This forms the basis of Diagram 2 on page 14.

In both cases the presence of an air escort just before dark is invaluable, for example 1 to make certain that the area of the second turn is free from U-Boats and in example 2, to make certain that shadowers are kept down and that they miss the evening turn.

With the coming of summer and the much shorter nights, we must be prepared for more daylight attacks. I expect these to take place usually shortly after dawn, since the U-Boat must proceed on the surface to gain position for submerged attack. A dawn patrol is therefore of enormous value. If possible one likes at least two aircraft at dawn, so that if there has been an attack during the night, one can send one back to the scene of the party, where, if the surface escorts have done their stuff, there may well be

DIAGRAM. 2-

NOTE :- U.S. DESTROYER JOINING FROM ICELAND TO REINFORCE FOUND 3 U-BOATS IN AREA 'A' WITH ONE HOME BOUND CONVOY.

a U-Boat on the surface recovering from the effects of the night before.

Last, but by no means least, we like an afternoon patrol, as it is at this time that the harassed Group Commander usually tries to snatch a couple of hours sleep. I can assure you that this is much sounder and more beneficial if he knows that there is a wideawake aircraft doing a Viper or Cobra round him while he sleeps.

I will leave aircraft recognition to someone else with more practical experience of this subject. On the North Atlantic run it is one of the problems which we have been very largely spared, thank goodness.

In any case, here's to many a successful "Hey Rube," the more the merrier as far as we are concerned. And if you arrive "Hungry" I think we shall usually have something pretty juicy in the Snake Pit for you.

With practice I'm sure the team work will improve apace and the rate of scoring with it.

Do let us have suggestions. It is the job of the halves to feed the forwards, and if we seem rather slow at backing up, remember that some of us are rather past our prime, and often short of wind. I refer of course to the ships not the chaps in them.

A Note for White Wellingtons at night.

"Is this possible, Senor?" asked the commandant.

"It is true."

... and the commandant continued—

"But the stern-gallery? How, in the name of all witches and miracles, came your valour thither?"

"Simply enough, and owing neither to witch nor miracle. The night before last we passed the mouth of the bay in our two canoes, which we had lashed together after the fashion I had seen in the Moluccas, to keep them afloat in the surf. We had scraped the canoes bright the day before, and rubbed them with white clay, that they might be invisible at night; and so we got safely to the Morro Grande, passing within half a mile of your ship."

"Oh! my scoundrels of sentinels!"

"We landed at the back of the Morro, and lay there all day, purposed to do that which, with your pardon, we have done. We took our sails of Indian cloth, whitened them likewise with clay which we had brought with us from the river (expecting to find a Spanish ship as we went along the coast, and determined to attempt her, or die with honour), and laid them over us on the canoes, paddling from underneath them. So that, had your sentinels been awake, they would have hardly made us out till we were close on board..."

From "Westward Ho!" Chapter XXVI.

II.—ANTI-SHIPPING

Torpedo Operations in May

During the month of May, 42 Torpedoes were dropped by the North Coates Wing and Nos. 489, 455 and 415 Squadrons, resulting in five Merchant Vessels being seriously damaged and three others probably damaged.

Of the 42 attacks, 22 were by the North Coates Wing who carried out two Wing Operations on May 17 and May 24 respectively. Of these, that which took place on May 17 produced valuable results, two Merchant Vessels being seriously damaged, one damaged and three Escort Vessels damaged.

Of the sorties by the Hampdens, one on May 16 off the Mandal Area by D. of 455 Squadron seriously damaged an 8,000-ton Tanker. The remaining Hampden sorties were unfortunate in that no records were obtained or any hits seen, owing to either bad visibility or violent evasive action.

The enemy is obviously fully alive to the danger of air Torpedo attacks on his convoys, and has greatly increased the number of Escort Vessels, which are better disposed on the flanks of his Merchant Vessels and are giving them better protection by putting up a powerful light flak barrage. This increase in flak protection and the increased strength of escorts is shown as follows :—

The 1st Beaufighter Wing Strike on April 18: nine Merchant Vessels were escorted by 4 "M" Class Minesweepers and two Armed Trawlers.

On May 17, 1943: six Merchant Vessels were escorted by three "M" Class Minesweepers and four Armed Trawlers.

On May 24, 1943: six Merchant Vessels were escorted by three "M" Class Minesweepers and seven Armed Trawlers.

As a result of this last strike, rather more flak was encountered than usual, and one Beaufighter was shot down. Nevertheless there is reason to think that although more escorts have been provided, the enemy may be finding a shortage of guns and/or personnel to man them. Pilots reported on the last strike that some guns were not being manned. This is borne out by the

Photographs which show that some gun positions have not been provided with guns to put in them. An explanation of the guns not being manned may be that the reputation of the Wing's cannon fire is well known in enemy flak gunner circles. It is known that considerable damage and casualties have been inflicted on recent strikes and discretion perhaps is considered the better part of valour.

There is no doubt that the success of an attack depends largely on the amount of surprise achieved. Each attack must be meticulously planned and each crew must know exactly what he is to do in the plan. Timing also is of the utmost importance. The attack of the anti-flak Beaufighters must be synchronised to within six seconds of that of the release of the Torpedoes.

The last strike by the Beaufighter Wing on May 24 (*see* plate 7) from North Coates did not achieve its main objective for the following reasons :—

- (1) Unsuitable weather conditions for combined attack.
- (2) The Wing attacked Fishing Vessels prior to the main attack being delivered. This was due to lack of knowledge of position of the enemy convoy.
- (3) The Wing was dispersed by this diversion and the full weight of the attack was not brought to bear on the main concentrations. The previous attack on enemy Fishing Vessels caused an alarm and surprise was lost.

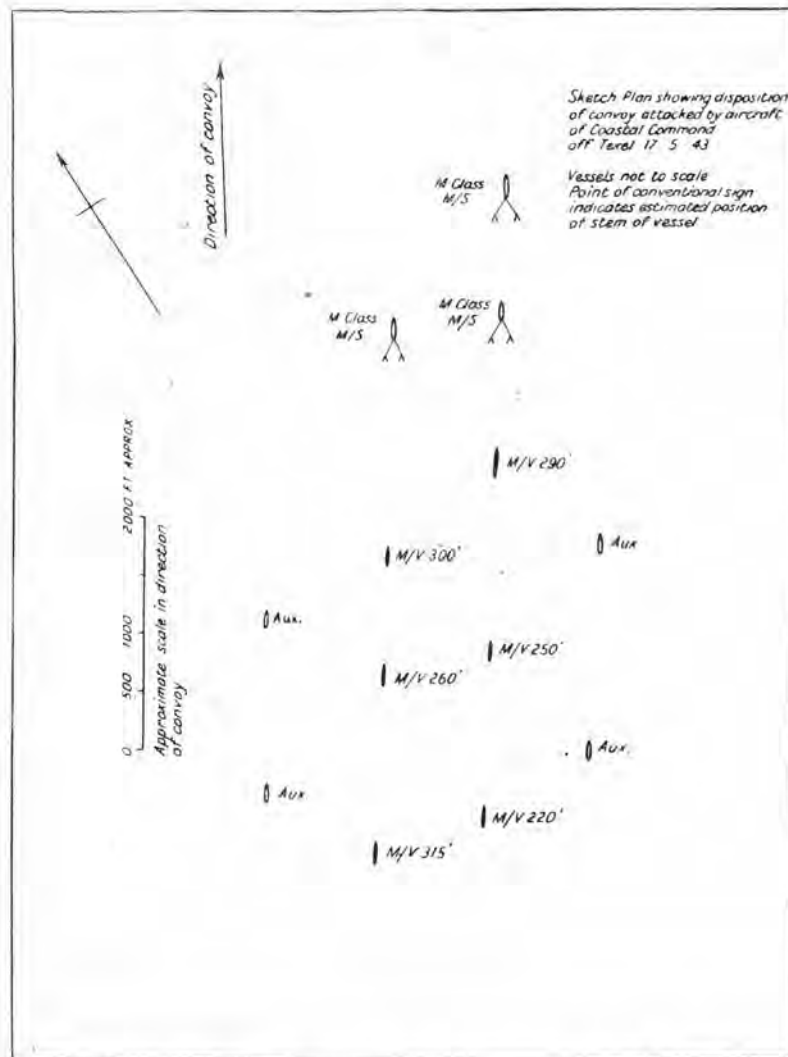
Sound preparation prior to these Wing attacks is essential, as has been well demonstrated by the Wing's previous successes. However sound this planning may be, all may be brought to naught if the pilot does not drop his Torpedo correctly. Range and a good point of aim are essential to bring a Torpedo attack to its rightful conclusion. The offensive against the enemy shippings must go on with ever-increasing intensity. It is, therefore, the responsibility of every pilot of the Coastal Command striking force to make certain that his individual effort is helping to put one more of the Axis ships at the bottom of the sea.

Offensive against Enemy Shipping

No. 16 Group Beaufighter Wing carried out another successful daylight attack on a North-bound Enemy Convoy off Texel on May 17. The convoy consisted of six merchant vessels disposed in two lines ahead, escorted by three "M" class minesweepers in front, in a Vic formation, and four auxiliary trawlers, two on each wing. All the merchant vessels were flying balloons. The striking force consisted of nine anti-Flak aircraft of 236 Squadron, each armed with two 250-lb. G.P. bombs, three sec. delay, and four cannon; six aircraft of No. 143 Squadron armed with cannon, and 11 aircraft of 254 Squadron, armed with cannon and torpedoes. The wing was escorted

by Spitfires. Six aircraft of No. 254 Squadron were to attack the leading merchant vessel of the two columns. Three aircraft of No. 236 Squadron were to attack each auxiliary trawler escorting these vessels and six aircraft of No. 143 Squadron were to attack the "M" class minesweepers.

Although more flak was met than on previous strikes, the attack was carried out as planned. All the minesweepers and escorts were hit by cannon fire and the minesweeper leading the port column was seen to be on fire. One of the merchant vessels, of some 2,500 tons, was hit by a torpedo and sunk.



The photographs of this strike, on plates 8 and 9, and the sketch plan on this page show very clearly the part played by photography both in planning a strike against the enemy merchant shipping that sails in the southern part of the North Sea and, in the subsequent analysis, to assess the results.

The north-bound convoy in question was sighted in the first place by a Mustang of Army Co-operation Command shortly after it had left the Hook of Holland. It was subsequently sighted at 1115 hours and photographed from 28,000 ft., by a P.R. aircraft, when 4 miles off IJmuiden; and it was sighted again from sea level, by another Mustang of No. 2 (Army Co-operation) Squadron at around 1300 hours, when approaching Egmond (see plate 9). This latter aircraft also secured photographs of the additional escort of four "M" Class minesweepers which was waiting off Den Helder to escort the convoy through what the enemy evidently considers to be the most dangerous part of the route. (See plate 9.)

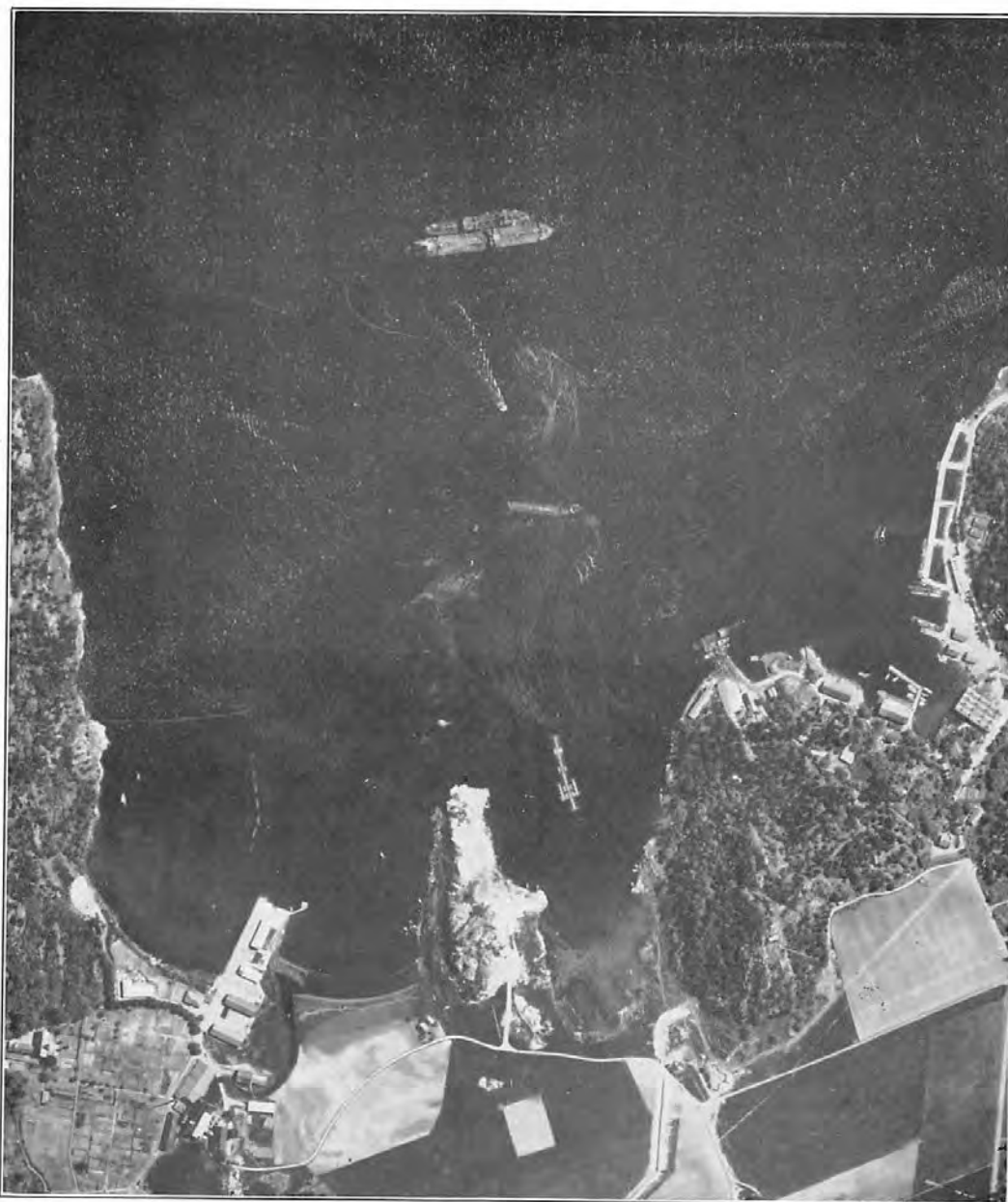
It was on these photographs that the tactics of the strike were planned. By the time the strike wing made contact with the convoy, at 1630 hours, it was off Texel, with ships and escorts disposed as shown in the sketch plan. The fourth minesweeper was stated to be well ahead of the main convoy. Other than the addition of the minesweepers, only minor changes in disposition had been made since the earlier sightings.

Photographs taken during the attack, of which three are reproduced on plates 8 and 9, establish that—

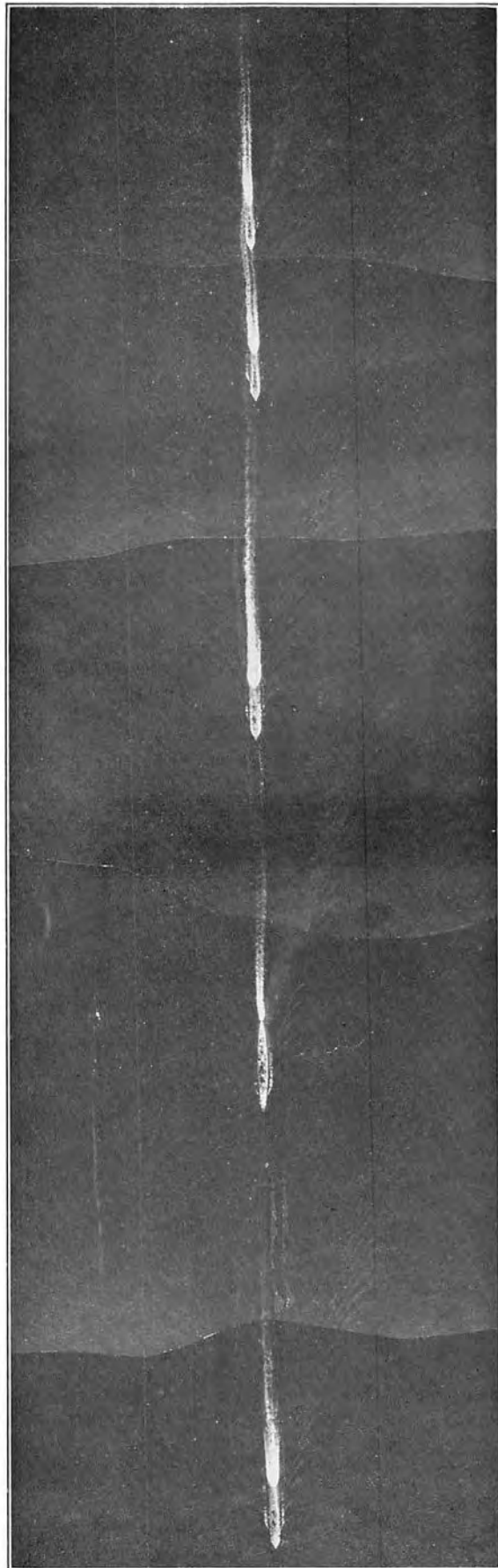
- (a) Cannon strikes were scored on all the minesweepers.
- (b) That the one leading the port column was set well alight.
- (c) That a 290-ft. vessel was hit by a torpedo.

This vessel was also photographed from close up, establishing the fact that she was carrying a cargo of coal or coke, probably to Scandinavia. This suggests that on south-bound voyages she would have been engaged in the carriage of iron ore. It will be noted that although she has a gun emplacement on the poop, the gun is missing.

Hampdens J and F of No. 455 Torpedo Squadron escorted by two Beaufighters of No. 235 Squadron were on a rover patrol off the Norwegian Coast on May 12 when an unescorted enemy merchant vessel of 2,500 tons was sighted and attacked. Weather conditions were unfavourable and owing to the restricted visibility in rain, both F and J carried out three attacks before being able to position themselves correctly for a successful torpedo run. No hits were observed. After circling the ship for some minutes it was seen that the merchant vessel had been hit forward of the superstructure on the starboard side, and that the decks were awash. As F and J set course for base, the crew of the Merchant Vessel were seen taking to the lifeboats.



On May 16, a Hampden of No. 455 Squadron, R.A.A.F., scored a torpedo hit on a big tanker off the Naze. A few days later a 10,500-ton tanker was seen lying near Kristiansand S. with 50 ft. of deck plating missing at the stern where the hull presented a jagged appearance. The above photograph, taken by 540 Squadron, shows a smaller tanker alongside, doubtless transferring the part of the valuable cargo that remained unspoiled. There is little doubt that this was the tanker attacked. As the engines are in the stern, the damage will no doubt incapacitate the ship for some months to come.

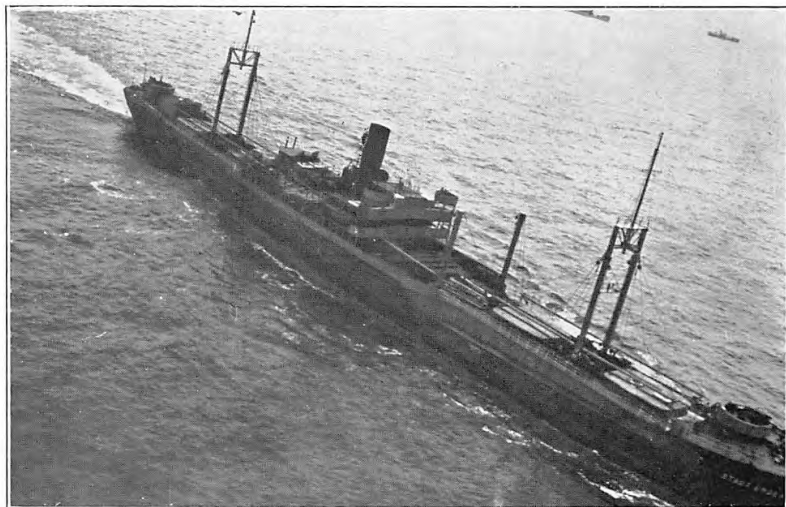


The *Nuremberg* and escort in the Leads, south-bound,
photographed by P.R.U., 540 Squadron, on May 1, 1943.



TARGETS FOR TOMORROW.

The above photograph taken by 540 Squadron shows a number of major units of the German Fleet in Gdynia, the ex-Polish Baltic port. Gdynia has increased its importance as a naval base since Kiel has been a target for both day and night attack and many refits, some of a major nature, are carried out there. The battle cruiser *Gneisenau*, seen on the left of the above photograph, has been at Gdynia since the break-out from Brest, more than a year ago. The damage she sustained on the voyage back to Germany has called for very extensive repairs. As may be seen, her bows have been cut away, her superstructure stripped and most of her armament removed. Also in the port on the day when this photograph was taken—May 21—were the 8-in. cruiser *Prinz Eugen*, the 6-in. cruiser *Emden* and an obsolete battleship of the *Schlesien* class. A number of tank landing craft may be seen in the same basin.



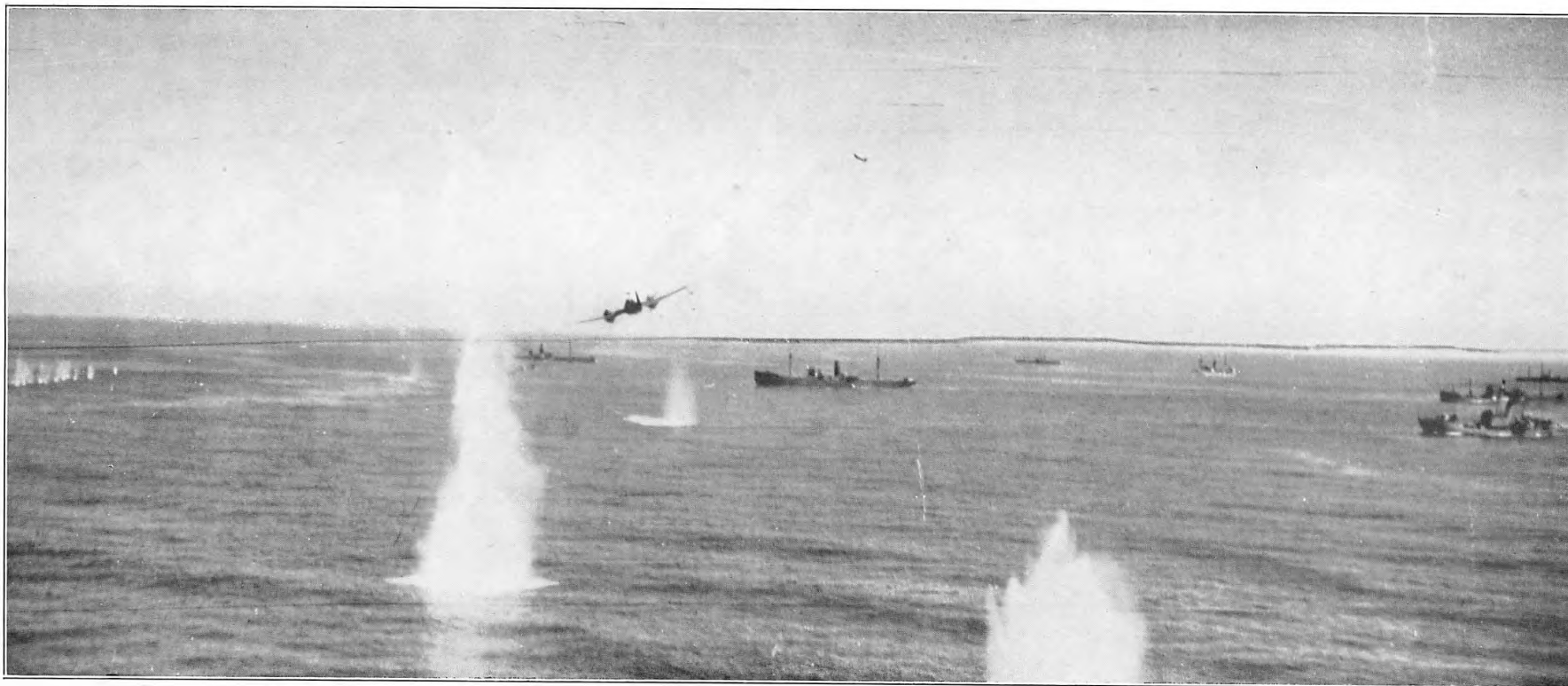
The principal ship in the convoy : the German *Stadt Emden*.



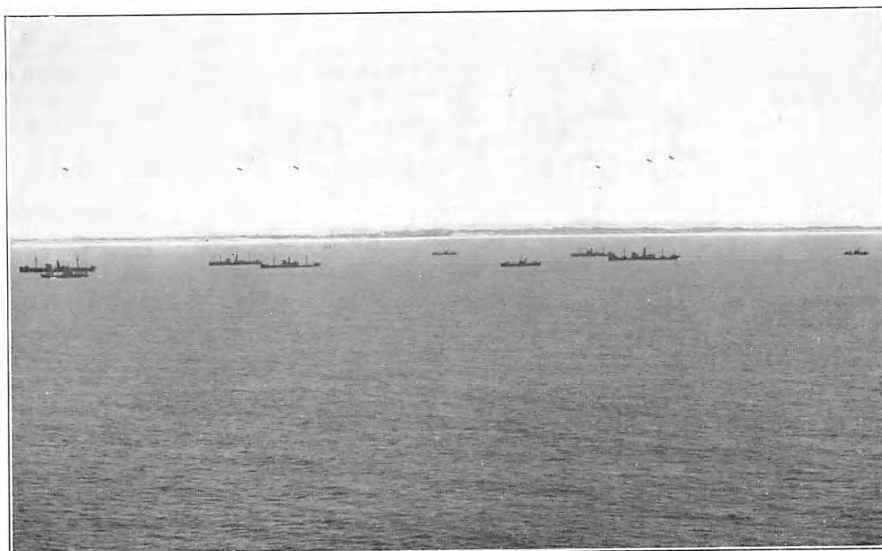
One of the armed trawlers providing escort.



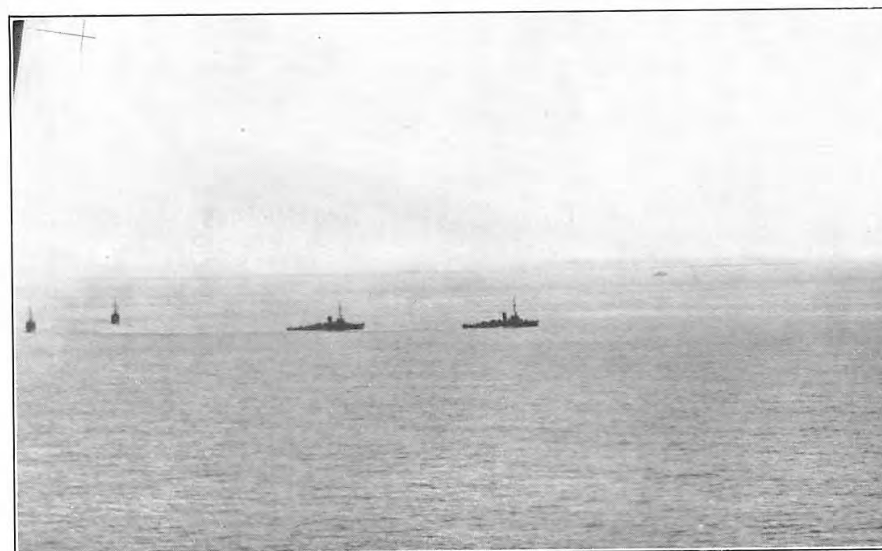
Photographs during the Beaufighter Wing strike on May 24, referred to on page 15.



Torpedo-Fighter attack on enemy convoy off Texel, by No. 16 Group Beaufighters, on May 17. (See letterpress pages 15-16.)



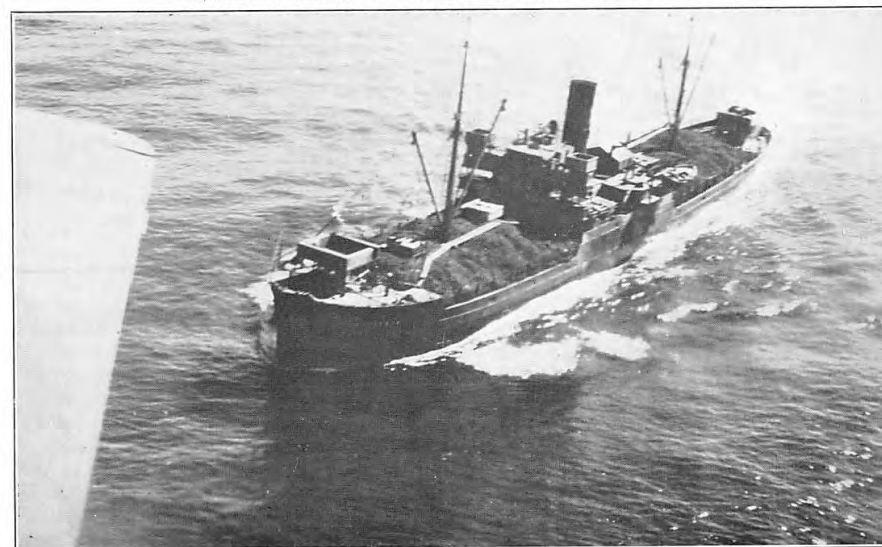
Convoy sighted by Army Co-op. Mustang off Egmond.



M/Class minesweepers waiting to join convoy off Den Helder.



General view of the action.



A 290-ft. vessel hit by a torpedo, with cargo of coal or coke clearly visible. There is no gun in the forward gun position.

Reconnaissance and action photographs of north-bound convoy attacked on May 17. (See letterpress pages 15 and 16.)

III.—OTHER OPERATIONAL FLYING

Photography of the Dams

Two days after the attack on the Moehne, Eder and Sorpe dams by Bomber Command, dramatic photographs published in the daily press showed to the public the breaches in the dams and the destruction caused by the released water. These photographs were the climax of but one routine task of the Photographic Reconnaissance Squadrons. As early as January 25, almost four months before the attack, No. 541 Squadron was ordered to cover the Moehne dam and reservoir. Beginning on February 7, a series of nine sorties were flown, covering a period of 12 days. The weather during this time was highly unsatisfactory for photography and it was not until the seventh attempt that results were even partially successful.

From these photographs, Intelligence were able to build up the first part of the necessary information, and to construct a model for the planning of the attack. At that time there was very little information available about the dam, and it is interesting to note that the details deduced from the photographs were later verified from a German publication, *Das Gas und Wasserfach*, dated July 23, 1932. For instance, an estimate of the depth of water of 13 ft. at one point, was within a foot of the actual depth.

This publication also provided a diagram showing the section of the dam and details of the area concerned. Periodically, during the following weeks, the dam was photographed by Nos. 541 and 542 Squadrons, to provide additional information about the dam itself and changes in the water level and defences. In February, the torpedo boom was seen to have been anchored in a haphazard and ineffectual manner. From a sortie flown on April 5, which also included the Sorpe and Eder dams for the first time, it was seen that the boom had been straightened out and anchored close to and parallel to the dam. This probably made the eventual task of the attacking aircraft all the more difficult, and it was at first thought that the enemy might have learned of the intended attack. As there was no evidence that the anti-aircraft defences had been increased, this theory was dismissed. One officer, who knows the country well, observed that the reason for it might be because of the summer excursions which are run on the reservoir, and a wish on the part of the authorities to impress the people with the efficiency of the defences.

On the same photographs certain interesting changes were observed. Some new and strange oblong platforms, each about 50 ft. long and 6 ft. wide, were seen close to the dam. It was not clear whether they were floating or fixed to the wall. In view of the rearrangement of the torpedo boom, the possibility of the new gun emplacements could not be dismissed. Subsequent photographs showed the number to have increased to eight, and by close study of these platforms and the building materials lying on the road along the top of the dam, it was eventually decided that their purpose was to block up the

lower portion of the overflow apertures, thus raising the surface of the water by 3 ft. and increasing the storage by almost 500,000 tons of water.

The long programme of sorties were flown in varying weather conditions and were by no means unopposed by the enemy. There were no heavy flak positions at the dams, but so that the enemy would not suspect our intentions, and to obtain the maximum usefulness out of a given flight, targets in the neighbouring Ruhr and Holland were also covered on the same sorties. One pilot, flying on April 4, met very intense and accurate flak while over the Ruhr and later, over Essen, the engine cut, through an air lock in the petrol system. The pilot cleared this and continued with his task. The same pilots flew most of these sorties so that they came to know the valleys and dams well. This visual familiarity with the landscape was of help to them when they flew over the area after the attacks, for they were able to observe the changes in the countryside made by the floods.

The attack on the three dams was made by Bomber Command on the night of May 16/17.

No. 542 Squadron had been warned of the hour of the attack and that photographic reconnaissance would be required of the result. The crews were up early to study the weather conditions, which appeared to be favourable, and the first aircraft was airborne at 0730 hours, to be at the target at the first photographic light. Thus, eight hours after the attack, the first photographs were being taken. This pilot, who had flown over the dam three days before, said on his return:—"Visibility was exceptional. When I was about 150 miles from the Moehne dam, I could see the industrial haze over the Ruhr area and what appeared to be cloud to the east. On flying closer I saw that what had seemed to be cloud was the sun shining on the flood waters. I was flying at 30,000 ft. and I looked down into the deep valley, which had seemed so peaceful three days before, but now it was a wide torrent, with the sun shining on it. Twenty-five miles from the Ruhr the whole valley of the river was inundated, with only patches of high ground and the tops of trees, high buildings and church steeples which I had seen as part of the pattern of the landscape a few days before, showing above the flood waters. The even flow was broken as it rushed past these obstacles. As I came nearer the dam I could see that the water was about a mile wide. I was overcome by the immensity of it and when I realized what had happened I just wondered if the powers that be realized just how much damage had been done.

"The Ruhr was covered with haze and when I broke clear of this, I began my photography, moving up towards the dam. It was easy to pinpoint because the breach showed up, and I could see the water rushing through. The control house at the foot of the dam, which I had seen two days before, had already disappeared. On the banks, the big trees were like little shrubs emerging from

the water. The level of the water above the dam had fallen, leaving huge tracts of dark brown mud around the edges. This was eight hours after the bombing. The upper reaches of the lake were completely dry, except for the small portion where the sluice gates had been closed.

"I then flew on to the Eder dam. The floods were easy to see. The long, winding lake, above the Eder dam, was almost drained, and as a landmark it was no longer there. If it hadn't been for the flood water breaking out of the breach in the dam, it would have been difficult to find the lake. The water flowed through the narrow valley and from 30,000 ft. I could see the movement of the water following the course of the original stream.

"It stretched eastwards and northwards to Kassel. On my second run over the Eder dam, I saw two aircraft coming from the north-east so I decided that it was time for me to come home.

"While I was landing, I could see scrambled eggs at the end of the runway. It was the Station Commander and I wondered if I had done anything wrong. But he was only waiting to welcome me home. When I landed he came up to me and said, 'Have they hit them?' and I was able to answer, 'Yes, they've pranged two of them properly. The floods are spreading for miles.' So he went off to telephone the news to Bomber Command."

The films were immediately developed and viewed by the Intelligence officer who had collated the preliminary information. He said afterwards, "For a minute I did not recognize the place. I feared for a moment that they had bombed the wrong dam. I looked for the power station, but it had gone. The place which I had studied in great detail for many months looked completely different, and it was only on a second look that I recognized the familiar landmarks and realized that the reservoir was practically empty."

The breach in the dam, in relation to the known length of the wall was measured on the photographs and its width determined at between 180 ft. and 200 ft. This information was passed immediately to the C.-in-C., Bomber Command, and to the Air Ministry who were anxiously awaiting the news. The first reconnaissance sortie, already described by the pilot, was followed by another sortie at 1045 hours and by a third one in the same afternoon.

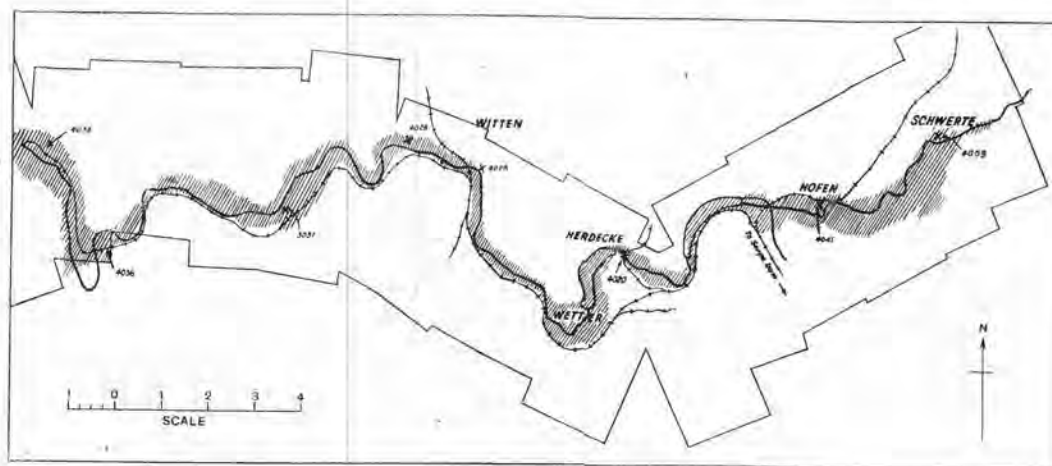
From photographs taken on these three sorties, it was apparent that two of the dams were breached and the third, the Sorpe dam, damaged. Water was still seen to be pouring through the gaps in both the Moehe and Eder dams and the photographs recorded the widespread damage caused by the rush of water down the valleys. Villages were seen flooded, bridges swept away, power stations and waterworks isolated and railway communications disrupted.

The Moehe reservoir (see Frontispiece) was shown to be practically dry, but the fact that water was still seen flowing through the breach showed that the level of the small area of water remaining would subside still further.

The frontispiece further shows the bed of the stream which originally ran through the valley, also fields, roads and a bridge which were inundated when the dam was built. The photograph also shows, at the two upper ends of the reservoir, the intake basins which contain no more than 5 per cent. of the original contents of the reservoir. They exist merely to free the water from silt and mud before it passes into the main body of the reservoir.

Although the Sorpe dam was not breached, photographs show the points where an explosion had occurred. The structure of the dam, which differs from the Eder and Moehe dams, was not sufficiently weakened to cause complete destruction although there is still a possibility that this may happen. Alternatively the dam may have to be drained before it can be repaired—a serious loss of water to the enemy as after it was constructed this reservoir took three years to fill.

Subsequent sorties were flown by No. 542 Squadron on the following days to record the passage of the flood waters as they passed down the valleys. It is not necessary in this article to describe the results as they have already been told in the various Intelligence Summaries and the actual photographs taken by the Squadron, showing town and villages inundated and communications destroyed, have been published in the Press. As an example, a diagram showing the area damaged by the floods in one small stretch of the Ruhr valley between Schwerte and a point three miles east of Heisingen, is printed below.





Survivors from M/V Port Victor sighted by L/86, referred to in the letter below.

164 Kent House Road
Beckenham
Kent
30.5.1943
Air Ministry
Kingsway W.C.2.

Dear Sir,
The writer commanded M/V
"PORT VICTOR" sunk by enemy action
560' SW of Cape Clear, April 30. 1943;
survivors from which were sighted by
searching Liberator next morning.

I have already written a
letter of gratitude to Mr. Lieut J. D. HANCOCK,
86 Squadron, Home Forces, and am
sorry that I did not preserve a copy
to enclose herewith.

The purpose of the present
note is to express our fervent thanks
to those at Headquarters who were
responsible for the organisation of
what I shall always call
the Perfect Rescue.

Mr. Walker's note, scribbled on a
page torn from his log book,
hangs framed before me as I
write, beneath a picture of my
lost ship.

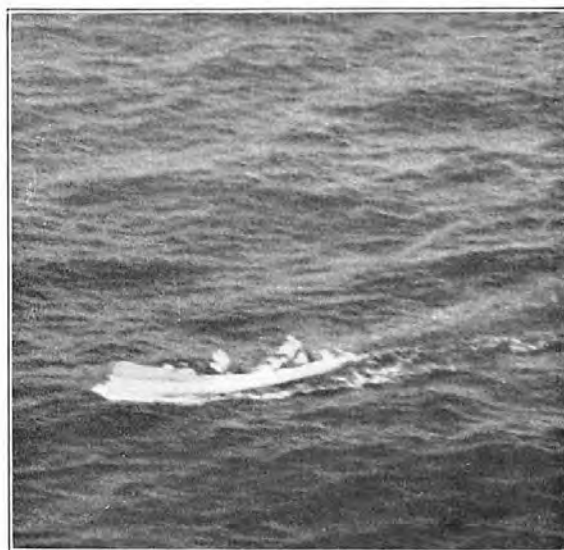
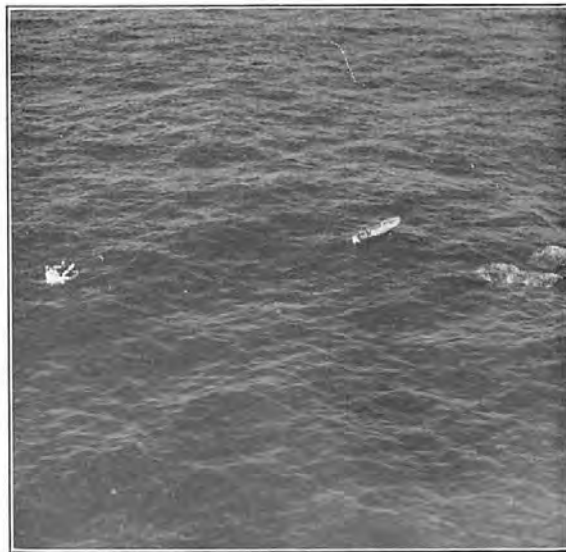
The sound of his engines
was the finest music these ears
will ever hear.

God bless and prosper
the R.N.F.

Yours faithfully
W. G. Higgs.

(CAPTAIN W. G. HIGGS, O.B.E.)

The above letter was written by the Master of the M/V Port Victor, survivors from which were found by L/86 during the evening of April 30. Captain Higgs can rest assured that it is a real, although unfortunately a rare pleasure to Coastal Command to have an opportunity of giving direct help of this kind to the merchant seaman of whose gallant devotion to duty we see so much.



Rescue by air-borne lifeboat, May 5. (See letterpress page 19.)

Combats with Enemy Aircraft

Beaufighter Q No. 143 Beaufighter Squadron, returning from a reconnaissance off the Dutch Coast, sighted a Ju.88 on the port bow, about half a mile ahead. The Ju.88 did not appear to recognise the Beaufighter. Q.143 turned to starboard and, closing astern of the enemy aircraft, opened fire. But too much deflection was allowed. The pilot corrected his aim and after his second burst, the starboard engine of the enemy aircraft burst into flames. The rear gunner of the Ju.88 returned the fire and disabled the port engine of the Beaufighter. Q.143 broke away to port and the observer saw the enemy aircraft crash into the sea. The pilot of Q.143 flew home successfully, landing on one engine.

Aircraft K and M of No. 144 Torpedo Beaufighter Squadron, on a shipping strike off the Norwegian Coast, sighted two Me.109s. The Me.109s closed astern of K and M who immediately began evasive tactics.

The enemy aircraft climbed to 1,000 ft. and then engaged M and K respectively, on their starboard quarters. Both aircraft had to jettison their torpedoes and attempt to climb to cloud cover. Another Me.109 joined in, and two enemy aircraft concentrated their attack on M.144 and succeeded in stopping it from flying out to sea. The enemy aircraft made numerous hits on aircraft M but did not succeed in doing any serious damage. When they were out of ammunition they flew alongside the aircraft, apparently endeavouring to ascertain the extent of the damage. They then flew away in an easterly direction. No damage was done to crew in aircraft K, but the Navigator of aircraft M received a small shrapnel wound in the right arm. Aircraft M had to crash land at base, due to hydraulic failure.

Beaufighter "A," one of three Beaufighters of No. 404 Beaufighter Squadron, escorting six Hampdens on a shipping strike off the Norwegian Coast sighted one Ha.138 about 1,500 yards distant. A.404 approached the enemy aircraft from dead astern, opening fire at 600 yards and closing to 100 yards. Both port and starboard engines of the Ha.138 were seen to burst into

flames, with dense clouds of black smoke pouring from them. The enemy aircraft was seen to be losing height rapidly. At this point, A.404 found itself over an enemy convoy which the Ha.138 had been escorting. It met very heavy flak from the escort vessels directly beneath, and was hit in the port engine, which caught fire. Hits were also received in the hydraulic system which caused the port wheel to drop down. The pilot of A.404 turned sharply to port and, at the same time, sighted two F.W.190s which were crossing his bow at 600 yards range. Aircraft A.404 fired a short burst at the rear F.W.190 and then dived to sea level. At this point the flames from the Port engine subsided and "A" set course for base. After flying for five minutes, he overtook the formation of Hampdens and escorted them for a further 20 minutes before returning alone to base, where he made a successful crash landing.

Aircraft B and G of No. 235 Squadron, on a Fighter Patrol, sighted three aircraft flying at 600 ft., at a distance of about 3 miles. The pilot of Aircraft B was expecting to meet three friendly aircraft in this position and he continued on course. The three aircraft then began to climb and to turn astern, firing a white five or six star cartridge. As the three unidentified aircraft closed the range, the pilot of B.235 identified them as Ju.88s. He immediately opened up, and started a steep turn to starboard. The enemy aircraft were by this time almost dead astern at about 800 yards, range at 1,200 ft. They began to dive and opened fire on G.235 then flying in line astern to B.235. Aircraft B continued his steep turn to starboard and met the leading Ju.88 head on, opening fire with a short burst at 300 yards. Several pieces of metal were seen to fly off the enemy aircraft as it passed overhead and to port. The enemy aircraft passed astern and was later seen to crash into the sea, in flames. Aircraft B then turned to attack the remaining enemy aircraft which were climbing for cloud cover. Aircraft B again succeeded in making a head-on attack on a Ju.88, but no hits were observed and the Ju.88 disappeared into cloud. The enemy aircraft were not seen again.

Air-Sea Rescue

Rescue by Airborne Lifeboat

The Airborne Lifeboat described and illustrated in the February number of *Coastal Command Review*, No. 10, was dropped to the distressed crew of a Halifax which had been forced to ditch during the early hours of May 5, whilst returning from an attack on Dortmund.

The dinghy contained seven live members of the aircrew from the Halifax which had ditched approximately 50 miles east of Spurn Point. It was first sighted by the Met. Hudson from Bircham Newton at 0632 hours. This aircraft circled the dinghy, climbed to 2,000 ft., sent a message to base on its operational frequency, changed to MF/DF, and obtained a first class fix. The aircraft was instructed by base to remain with the dinghy until relieved.

Two Air-Sea Rescue Hudsons were immediately despatched, one carrying the Airborne Lifeboat. They arrived over the dinghy at 0825 hours, and whilst one circled, the aircraft carrying the lifeboat dropped a smoke float and, having made certain of the wind direction, it then dropped the boat. The lifeboat was released at 800 ft., directly over the dinghy, while flying up wind at 120 knots. The crew of the Hudson hardly dared breathe as it went down for this was the first time it had been used operationally. To their delight the parachutes blossomed out beautifully and the boat floated gently down, slightly nose first, and settled on the water no more than 20 yards down wind of the dinghy.

The Bomber crew at first thought that the bottom of the Hudson had fallen off. To their

amazement and joy, after they had recovered from their initial fright, they realized that it was a boat which was floating down, on three parachutes.

The lifeboat landed on the water with a splash. The parachutes floated away, having been automatically released directly the boat touched water. The dinghy crew soon paddled to the lifeboat and clambered aboard. After a preliminary investigation, two engines, a large compass

and rudder were found. While one member of the crew, who was the engineer, started the engines, another fixed the rudder in its place. In a few minutes the airmen-sailors were under way at a steady six knots. The Hudson then flashed them a course to steer. From then until they were intercepted and taken aboard an Air-Sea Rescue H.S.L., approximately fourteen miles from shore, air cover was provided by the Air-Sea rescue aircraft based in that area.

The Rescuers Rescued

The most interesting if unfortunate rescue during the month was in the Bay of Biscay.

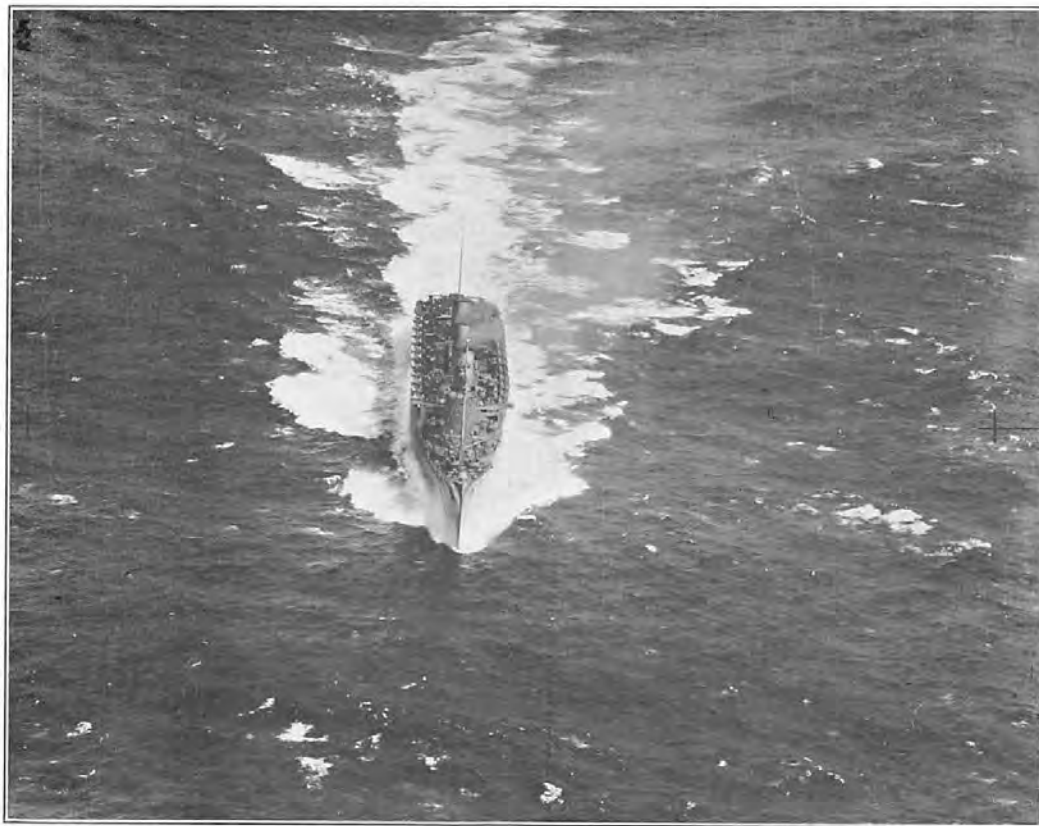
The story began when a Whitley of the Command was forced to ditch. Next day a Coastal Command Sunderland of 461 Squadron went in search of the Whitley's crew of six, known to be in their dinghy. The Sunderland's captain found the dinghy and tried to alight on the sea, but the swell was so great that the flying-boat was damaged and it sank. The captain was killed and his first pilot seriously injured. The first pilot was floating away from the wreckage and was almost out of sight when a Flight Sergeant swam to his rescue and brought him back to the dinghy, which had then been inflated by other members of the crew.

The following morning, another Sunderland of the same squadron sighted the dinghies of the Whitley and the Sunderland on the water, close together. Conditions were very bad, with cloud close to the sea, but the captain decided that he would try to alight. He did so, but once on the water he found that the state of the sea was worse than had been thought and, after taking the 16 occupants of the dinghies on board, he considered that it would be too hazardous to try to take off. His crew had made a stretcher out of one of the bunks for the injured pilot and all the survivors were given a hot meal.

Other aircraft appeared overhead and a Fighting French destroyer, which was searching for the survivors in the dinghies, arrived on the scene a few hours later. All the survivors were transferred to the destroyer, in a whaler, and the Sunderland, with the captain and the crew of six, were taken in tow.

After four and a half hours' towing, the bollard gave away and the Captain tried to take off with the skeleton crew who volunteered to fly with him. The attempt was successful but the hull of the Sunderland was damaged when a heavy wave struck it, ripping a hole 5 ft. by 3 ft. in the hull. The Captain realized that the aircraft would sink at once if he attempted to alight on the water, so he decided to land on an airfield close to his base. Every preparation was made for a possible accident, but he made a perfect landing.

Describing the close of his experience, the Captain said: "We went along on an even keel until we had almost stopped. We then just laid gently over on one float, buckling the wing tips slightly in doing so. All four engines were ticking over beautifully; indeed, it was as easy a landing as a normal one on water. Before I came down I had jettisoned all inflammable equipment and as much petrol as possible."



The *Queen Mary*, photographed by 423 Squadron.



The *Queen Elizabeth*, photographed by 120 Squadron.

Landfalls in Iceland.



Westmann Isles.



Heimaey, in the Westmann Isles.



Approaching Snæfells Jökull.



Summit of Snæfells Jökull.

IV.—SPECIALIST AND GENERAL ARTICLES

Landing in Iceland

In March of 1941 landing in Iceland meant coming back from a 4½-hour patrol well out to sea in a Battle, making for Kaldadarnes and landing on a short coco-matting and steel-mesh strip. There were no possibilities of diversion and the only radio aid was a rather doubtful Q.D.M. from the station H.F. D/F. If the wind didn't fit the runway, the old Battle was good at cross-wind landings. The "Met." people did their best, but their information was scanty and their charts necessarily a compound of imagination and faith, backed by experience and patient study.

What a change two years have seen! Today Iceland has every facility, including well-organized flying control. With the absence of barrage balloons and the lack of blackout restrictions, landing in Iceland is now a better proposition than landing in many parts of the United Kingdom. The geographical features of Iceland are so pronounced that even a map on a 1/1,000,000 scale would give almost all the details one needs. The island itself is so large that even P/O Prune, flying from the United Kingdom, couldn't miss it altogether. Having made a landfall he would then find it easy to crawl along the south coast, which has no fjords or deep indentations.

The first flight along the south coast of Iceland is an unforgettable experience, and although duty more often demands a landfall dead on track to Reykjavik, a course set for a point about 40 miles west of Hofn will take only a few minutes longer, and these minutes might perhaps be written down to "familiarization." Vatnajökull, the enormous ice-cap which reaches to within a few hundred yards of the sea, is quite unmistakable. One glacier flowing out of Vatna comes almost to the coast before ending abruptly in the shape of a lion's paw. At its extremity this is deeply crevassed, and reflected light springs up from the depths of the paw, giving a deep sapphire glow. It must be a trick of lighting similar to the well-known "daylight" signs used in advertising. The poet writes of "Ice mast-high . . . as green as emerald," but in many hours flying over ice I have only once seen a green berg and never a green glacier.

Following the coast line to the west one passes by mile after mile of flat, glacial moraine, intersected by ice-cold streams draining from the inland ice-caps; still further west are huge areas of black lava dust, formed by volcanic action at the end of the eighteenth century. Before this catastrophe, rich pasture land along the south coast supported many thousands of sheep and cattle. At the southernmost point of Iceland the black coastal desert ends abruptly in the craggy headlands of Portland and Vik; there is a small village here, also a camp with a radio station up on the hill.

Further to the west the friendly Westman Isles will be picked up, more often than not from 30 to 40 miles away, in the summer months. Heimaey, the largest isle, is an extinct volcano which has been cut in two as if smitten by some gigantic

sword, and half the crater is now the harbour of a prosperous little fishing town. Gulls nest here in very large numbers. There are usually clusters of small fishing vessels tossing about around here, in seas which are often very heavy.

From here onward a little gentle map-reading will bring one to the mouth of the Ölfuss river, and to Kaldadarnes, cuddled into the river's lower elbow. Whether briefed to land here or not, it will not be a waste of time to look at Kaldadarnes, as it is on the way anyhow. The immediate approaches are good, and the high ground to the north and west, is several miles away.

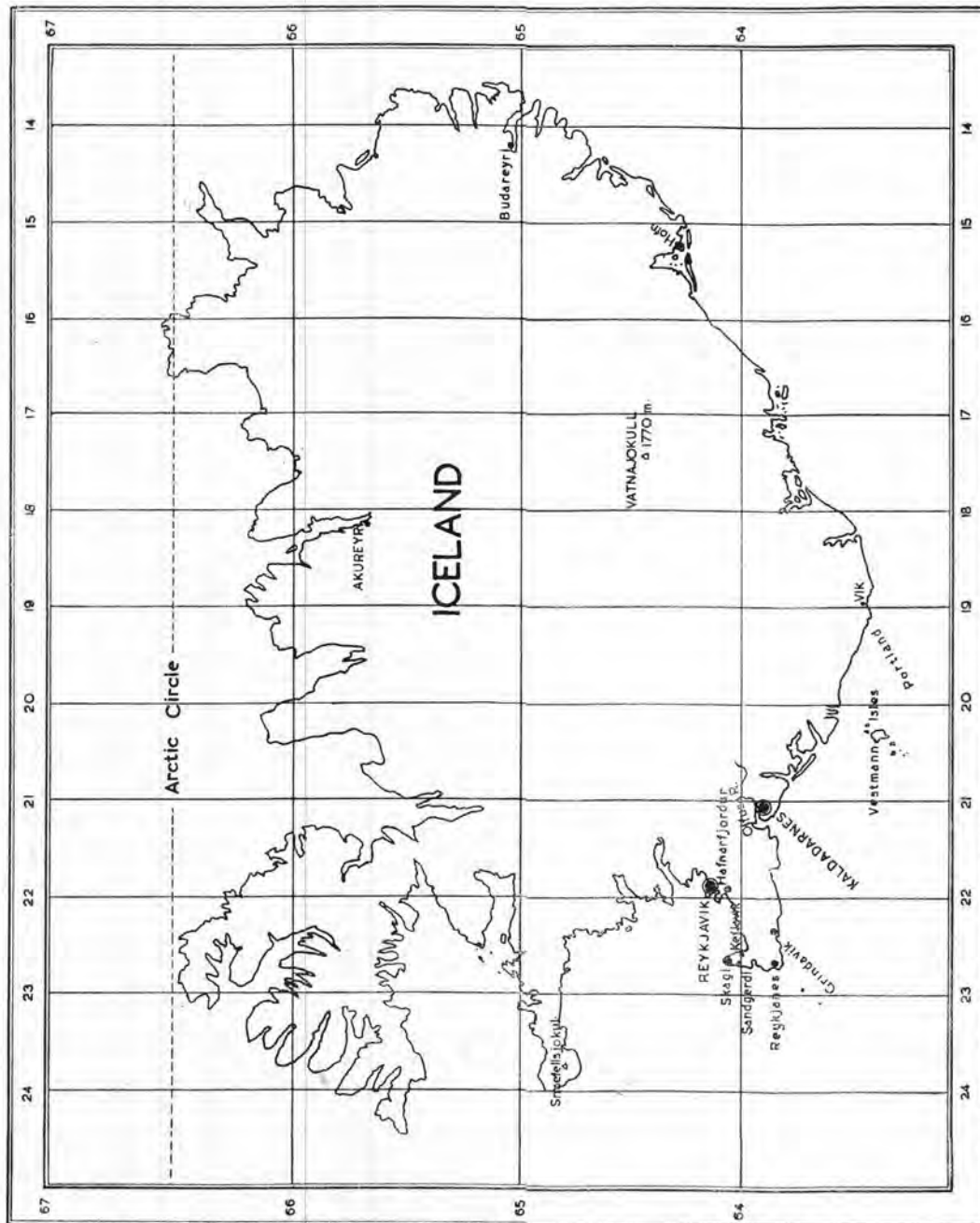
If there is no low cloud it is usual to cut across country just west of Kaldadarnes. Reykjavik is then only 10 minutes away. If this is not possible, more coast-crawling has to be done until the low ground to the east of Grindavik is reached, when it is usually possible to cut across the isthmus. If there is much low cloud this is a bad thing to do, as there are several rather unusual volcanic hills rising very suddenly just where you would least expect them. One of these hills reminds one of a gigantic rubbish dump or ash-heap, which in point of fact it is, thrown up from nature's industrial regions just below. In shape it is a perfect cone and quite unmistakable. A Sunderland and an American P.B.V. have crashed in this area while taking a short cut in poor weather.

There are many hot springs here and their plumes of steam begin to suggest the direction of landing, now only a few minutes away. Across the peninsular the west coast is picked up and followed up to Hafnarfjörður, a medium-sized fishing town with a small harbour and quays. Hafnarfjörður past and Reykjavik in sight, the course will normally pass over the country house of the Regent of Iceland, Mr. Sven Björnson; the house is conspicuous for its clean white walls and tiny spired chapel. There is a lot of traffic around Reykjavik nowadays, and on a fine day you will probably have to join the circle of aircraft milling round waiting for a "green." The circuit takes you over the harbour, usually quite full of merchant ships; they are well-trained and never shoot at aircraft coming in to land nowadays. The cathedral stands on the highest point of the town, which it seems to dominate, with its steep, rock-like proportions. The wind is usually south-westerly, and the approach lies over the harbour and town; the Hotel Borg and the post office, on opposite sides of the main square, are 70 to 80 ft. high, but there is plenty of clearance, and those tall radio masts south of the town are well off to starboard. Lake, park, a few hundred yards of meadow and here's the runway. It slopes up for part of its length and then over and down in a gentle gradient, right to the sea. It is a good, wide runway. As you brake remember that two years ago this airfield was an undrained swamp, and that off the runways it still retains some of its old characteristics.

Coming from the States, or from a patrol out to the south-west, one cannot afford to make a landfall just anywhere and coast-crawl. The west coast is not quite so friendly as the south. By far the best landmark on the west coast is Snaefellsjokul, which looms up like a piece of grounded cumulus stuck on to a mountain. Often it can be picked up more than 80 miles away. It then provides an unusually useful visual running fix. I once found it very useful coming in from the west with W/T U.S. and flying over 10/10 st. cu. up to 2,500 ft.—It stuck up like a Persil-washed pillow from the dingier counterpane of rippled cloud, and was first recognized over 50 miles away. By the way, when breaking cloud off south-west Iceland, remember the Fuglasker, those tiny bird sanctuary islands 10 or 20 miles south-west of Rekjanes; one of them is 226 ft. high and looks very hard.

If the weather is really bad and no radical diversion is possible, there is a north-south strip of excellent rolled turf at Skagi right on the tip of the Keflavik peninsular. This emergency landing ground is only a few yards from the coast and is practically at sea level. A glance at the map will show that this strip cannot be mistaken. An added advantage is the presence close by of the R.A.F. D/F station at Sandgerdi, noted for its most reliable bearings. These signal airmen are very versatile, and will speedily lay out a flare path at night. Incidentally, they usually have plenty of fresh eggs there, and these are scarce in Reykjavik now. There are two American airfields near Keflavik, in the south of this peninsular, known as Meeks and Patterson Fields.

All towns and villages in Iceland are lit up at night and to a war-weary traveller from

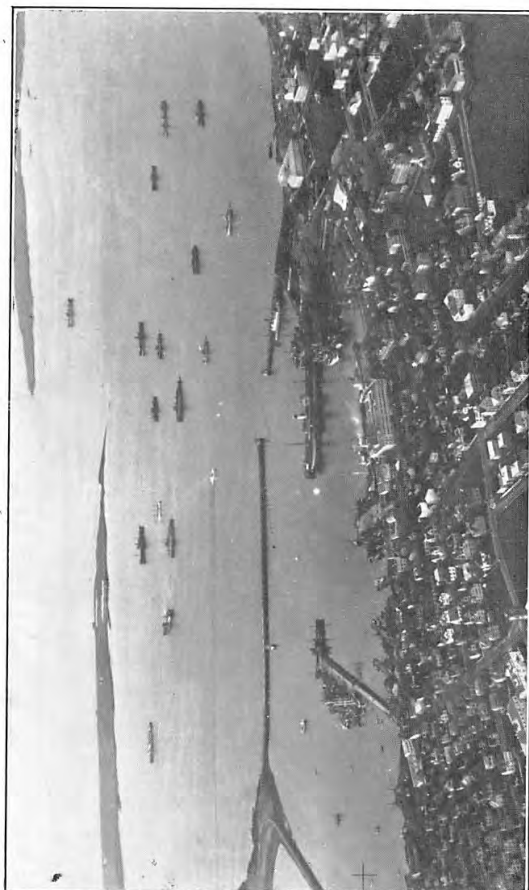




Akureyri : second biggest town in Iceland.



Meek's Field.



Reykjavik Harbour.



Reykjavik Landing Ground.



The flooding of Kaldadarnes, March 6. A general view of the camp, taken from high ground.



The road connecting the high and the low part of the camp.



Ice piled up on the frozen river.

England, Reykjavik then looks like fairyland. Most of the light-houses along the coast are still lit; you should be briefed with their characteristics.

So far no mention has been made of wireless aids, but Iceland offers plenty of these. In addition to the normal types of R.A.F., H.F. and M.F. stations, there is an American "Radio Range" about a mile south of Reykjavik, and three Icelandic trawler beacons along the south coast. The most powerful station in the whole of Iceland is the civil broadcasting station, which is capable of pushing out 100 kws. on 271 kc/s although it normally works on much lower power. This has been found reliable up to 500 miles away and more than one pilot has homed with his loop all the way to Iceland from Northern Ireland. It is not to be recommended that the procedure should be followed all the way from Ireland! The Intelligence Officer at the airfield of departure will normally be able to provide the hours of transmission.

Space does not permit of a thorough survey of all airfields and emergency landing grounds in Iceland, but a few minutes spent before take-off, marking in e.l.gs. on a flying map, would not be wasted. Along the south coast there are many stretches of sand where a belly landing could safely be made, and some good enough for a normal landing. If you have to try this, look out for the Icelandic telephone line which links up the coastal villages; a certain Group

Captain once made an inverted landing in a Moth just south of Kaldadarnes while sabotaging this line.

Nothing has yet been said of flying-boats, but nature has provided many sheltered bays and fjords where they may put down, and there are no very strong currents around Iceland. Mooring buoys exist only at Skerjafjörður (Reykjavik), Akureyri (in the north) and Budareyri (in the east). The last-named base has been used only for Northrop seaplanes and the fjord is too narrow to be safe for large flying-boats except in very good weather.

In the early days, the spirit of adventure prompted one Battle pilot to land on Vatnajökull; that he took-off again without incident demonstrates the fact that most ice-caps of any size are smooth and flat towards their centres. In the Autumn of '40, a Flight Commander of 98, the first squadron in Iceland, forced-landed on this same ice-cap with the British Army G-1 as passenger. They reached a farm after two days tramping and were picked up safely by the search party. Ice-caps are not, however, recommended as e.l.gs.

Although in winter we have our share of darkness, for many weeks in summer there is perpetual daylight, an advantage which all the ingenuity of Flying Control cannot achieve in the United Kingdom. Yes, landing in Iceland nowadays is a piece of cake.

Flooding of Kaldadarnes

A letter from Iceland

"On the south-western shore of Iceland is Kaldadarnes Airfield, which occupies a barren, low-lying plain, extending from the foot of high mountains to the sea. It is bounded on the north by a part of the River Ölfus, which becomes frozen over so thickly during the winter months, that, in January, 1943, a fully-loaded Hudson actually bounced on the ice before crashing on the adjoining land.

"By early March, 1943, water from the mountains had packed the ice tighter and tighter, at this point, piling up huge blocks until an immovable barrier had been formed. Behind this the level of the water began to rise, and on the night of March 6, it broke through the embankment of lava rock and earth, overrunning a United States Army Camp, then the only connecting road and finally, Kaldadarnes Airfield.

"The runways area was quickly flooded and while members of the Service were rescuing equipment and documents, the water spread over the camp with increasing depth. Darkness, a biting wind gusting to gale force, and showers of snow and sleet were added to the menace and all personnel had to proceed to higher ground, near the officers' mess. This section of the camp is grouped around an Icelandic farm house built on a mound. Unfortunately the road connecting the mound with the lower lying parts of the camp was now a roaring flood, complete with a spectacular waterfall, which was a serious danger to those trying to wade to safety. Some parties had to rope themselves together.

"The water was still rising when the flying control tower was abandoned. The staff got away by wading through a depth of water, over 3 ft. The signals watch, isolated in the W/T transmitting hut, was less fortunate. Two men could not be rescued until dawn, after an anxious night on the tables, building a raft.

"When dawn came there was a depressing scene of desolation. The level of water had risen no further and in spite of a strong current, it was possible, by means of rafts and rubber dinghies, to salvage some kit from the living quarters. The congestion on the higher ground had become a problem and evacuation of personnel was necessary. Here the Americans came to our aid, in no uncertain manner.

"We were loaded into trucks and taken as far as possible along the road. From this point the only land above water was the narrow path, about a foot wide, along the top of the river embankment. We filed along this to the end where the Americans were waiting for us with assault boats and rubber rafts. These were towed by American troops wading at times up to their waists, in icy water. If the temperature was low, their spirits certainly were not. Jokes and wisecracks made it very clear that they intended giving the Royal Air Force service with a smile.

"Vehicles collected us and our kit at the other side of the ferry and accommodation for the night was found for us either at an American Hospital or in the nearest village.

"In addition to some American troops, over 750 Royal Air Force personnel were brought out of Kaldadarnes in this way, in a few hours. In some miraculous manner, the 500 men were billeted in the village—a service rendered by the inhabitants entirely without charge. They were fed that night and the following morning by a small American camp in the vicinity.

"The Americans put us to sleep in their ante-room, taking this sort of invasion as a matter of course. In the morning they had a convoy of 50 or more vehicles waiting to take us on to Reykjavik. There are two routes normally available. The shorter one is over the mountains and, therefore, frequently impassable, owing to snow and low cloud. The other is longer, but it skirts the mountains and is, therefore, usually more reliable at this time of year. It was decided to send an advance party to attempt the mountain route. In a short time it was obvious that no convoy could hope to get through. We of the advance party would be lucky if we got through ourselves. Snow was piled up on either side to a height of about 5 ft., leaving little more than the width of the truck in between. Three times we had to be towed out of drifts, once when we had run completely off the road and all but turned over down a bank. Meanwhile, the convoy had been warned by telephone to use the alternative route. This they did, arriving at Reykjavik before the advance party,

which took about 6½ hours for the journey of 36 miles.

"When the weather had improved, those left at Kaldadarnes had to make one of the runways sufficiently serviceable to get the aircraft away. The whole area was littered with ice floes, 40-gallon petrol drums and debris of all descriptions. Another difficulty was that the brake drums of the transport vehicles froze solid during momentary stops and had to be thawed out by de-icer vans. The same problem arose with the aircraft, for, in taxiing them out through the water, freezing of the wheel brakes could not be avoided. After countless setbacks, overcome by superb work on the part of a small ground crew, the aircraft were got away during the next few days, and, finally, under the threat of further and even more serious flooding, the remainder of the personnel were withdrawn. Numerous attempts by Liberator, PBY, Sunderland, Northrop and Hudson aircraft to break up the ice barrier by bombing, had proved spectacular, but totally ineffectual.

"When the danger and the discomfort had passed, one outstanding picture remained—that of the Accountant Officer struggling along the top of the embankment, with the rising water endangering every step, still clinging to his cash safe, convinced that even the flood was not going to get a penny out of him without filling in a 1771."

Evasion and Security Exercise

The following Evasion and Security Exercise is typical of many carried out in the Command during the past few months, with the co-operation of the military and the civil police.

A selected number of aircrew was chosen to play the rôle of evaders. They wore battle dress and flying boots. As there was a very obvious balloon barrage near by, they were not given any details of the location in which they were dropped, actually about eight miles from the aerodrome. The exercise began at 0915 hours but there was a thick fog which made it impossible to see the balloons even if they were up, so the difficulties of the evaders were multiplied.

An outline of the plan had already been sent to the Police and to the Military authorities who therefore, needed only telephone calls to establish zero hours for the exercise.

The rules under which the exercise was carried out were as follows:—

- (a) English was to be spoken by each evader, only to the same extent as he could speak German or French. His difficulties would thus be similar to those which he would encounter if he came down across the channel.
- (b) Each man carried only twopence in his pocket for one emergency telephone call.
- (c) Each man carried an emergency food box and compass.
- (d) Lifts were not barred, but no English could be used in asking for them.

- (e) Motor vehicles and motor cycles could be "borrowed"—excluding doctors' cars and pedal cycles. This rule was made to test the extent to which the public were immobilising vehicles. (The exercise was carried out before the restrictions were raised.)

- (f) The object was to return to the aerodrome without being detected.

- (g) No violence was allowed.

At 0950 hours a broadcast was made on the Station Public Address System, announcing the "baling out" of the crew of an enemy bomber in the vicinity of the aerodrome and instructing all ranks to keep a sharp look-out, while carrying on with normal duties.

Six telephone calls to warn Police and Military were necessary and arrangements were made with the Station Signals Officer for them to be put through on a priority basis. Although the first call was put through at 0952 hours, it was not until 1025 hours that contact was made on the sixth call.

At 1110 hours the L.D.A., who had entered into the spirit of the exercise too wholeheartedly by turning out the R.A.F. Regiment at full strength, "Jeeps" and "Beaverettes" included, telephoned the Station Intelligence to report the capture of two of the "crew."

One of the two—P/O A. had arranged to link up with a second evader, F/Lt. B. P/O A., on being dropped, therefore, walked along a road in the wake of the van, hoping to join up with F/Lt. B. This was done and when they recognised their whereabouts, they proceeded along a main road towards the *Granby Arms*.

It is noteworthy that a knowledge of local public houses made up for the lack of the barrage balloons as a guide.

Both P/O A. and F/Lt. B. had decided to try to get lifts or to borrow a car and they therefore kept to the road. They were signalled by a lorry driver who offered them a lift. This was avoided by a shake of the head and the two continued along the road.

They then found a Post Office van with its sole attendant then at the top of a telegraph pole. P/O A. and F/Lt. B. debated the advisability of borrowing the van, but after due consideration it was decided that the van was immobilised, and that the G.P.O. man was probably such an expert climber of poles that he would "whistle" down and intercept them. Both evaders therefore continued along the road. The *Granby Arms* loomed up out of the mist. A woman who was busy washing a step gave them a friendly wave and a smile.

Both men then continued, still on the main road. A lorry carrying chalk was stopped and the two evaders proceeded to get into the back. The driver called to them to come into the front and thus avoid being covered in chalk. F/Lt. B. did so but P/O A. tried to stay at the back. The driver insisted. With answering nods and smiles to the driver's conversation, both climbed into the front and away they went.

Close by the local railway station F/Lt. B. dug the driver in the ribs. The lorry stopped and the driver asked if they wished to get down. Both men grunted and got out. The driver appeared to think they were dumb lunatics; he merely looked astonished and drove off.

After walking a further quarter of a mile, another chalk lorry drew up and offered them a lift. Both men climbed into the front this time and found a most talkative driver whose bright comments on the weather and the general situation were answered by more nods and grunts.

About a mile further on, a car was seen ahead, outside a row of cottages. By this time the fog had almost disappeared. F/Lt. B. and P/O A. prepared to dismount and again applied the brakes with a dig in the ribs. The driver had apparently lost his enthusiasm for his passengers. He merely stopped long enough to disembark them and drove off.

Opposite the car was a haystack. Diving behind it, the two reconnoitred the road, the car and the cottages. All was peace and void of humanity. They sauntered across to the car and were rewarded by the sight of the starter key, snugly in position. They were inside and away in a flash.

Further investigation showed a spare can of petrol in the back, a civilian overcoat and a hat. P/O A. put on the overcoat and took off his field cap, and F/Lt. B. took off his tunic, under which he

wore a pullover, and put on the hat. Some cake in a locker was noted for future reference.

Unfortunately, the adventure ended abruptly alongside the aerodrome. There were still a few fog patches and they did not realize that they were so near home until a Beaverette drawn across the road by the R.A.F. Regiment barred further progress.

The two evaders leaped out of the car, through a hedge and across a field. Unfortunately, the terrain here is not kind to escapers as it abounds in dykes and ditches, some of formidable width and depth. Confronted by a particularly large and deep ditch, the evaders had to decide whether to swim for it or to admit that the R.A.F. Regiment, then in hot pursuit, had shot them. Both decided that they had been shot.

This adventure ended at 1045 hours and at that moment, the owner of the car arrived in a lorry, very obviously embarrassed by his transgression against the Defence of the Realm Act.

* * *

The next man to report progress was P/O. C who was dropped at 0954 hours and who walked a distance, as the crow flies, of some five and a half miles, to a village, two miles from the aerodrome.

As P/O. C is not a crow and did not fly, the distance was considerably greater. The walk was made via fields and lanes and the several people who passed and nodded appeared to see nothing unusual in an R.A.F. Officer with his cap in his hand and his sleeves rolled up to the elbow. The fog had gone by then and the day was warm.

The only incident was the meeting of two police cars, circumvented by stepping behind a tree. From this cover P/O. C watched the policemen hold a conversation, after which the evader left his tree and prepared to move on. As he stepped from cover, a Jeep came round the bend and at 1145 hours P/O. C realized that one must move with the utmost caution on the outskirts of villages. His freedom was ended.

* * *

F/Sgt. D was the next prisoner. He was dropped near a school, some seven miles W.S.W. of the aerodrome. He walked north on the cover side of a hedge, parallel with the main road, and for some time he watched a military motor cyclist slowly patrolling the road. Watching his opportunity, he crossed the road to find a railway line where he hoped to pick up a goods train travelling slowly enough for him to jump it to the local railway station.

He suddenly struck a by-road and almost ran into a lorry load of troops, parked at the side. He decided to give up the train idea, made a detour, returned to the road at some distance from the lorry and hid in a ditch to wait for passing traffic. Shortly afterwards a lorry full of meat arrived. It was driven by a girl.

He waved and in guttural accents he named the railway junction. The girl gave him a bright smile, a lift, and a load of conversation on the difficulties of driving in the fog.

Fending off with a torrent of grunts, F/Sgt. D felt he was not making the progress demanded by the situation, so after a while, *Ja, Ja*, was substituted for the grunts.

Eventually F/Sgt. D recognized the *Granby Arms*, and with a ferocious grunt and a gentle jab, placed in the driver's ribs, he intimated that he wished to alight.

Springing to earth, F/Sgt. D clicked his heels, bowed and said *Danke*. The girl beamed, let in the clutch and drove off.

Walking east across the fields, F/Sgt. D crossed the railway line north of the junction. Feeling thirsty, he pulled up a turnip and sucked at it. Shortly afterwards, he was confronted by an enormous ditch. Walking along it and looking at the other side, he came across a plank of wood: long, but not long enough! One end, when pushed out into midstream, was more than half way over. By taking a run, F/Sgt. D hoped to leap the obstacle. But the plank was rotten and the dyke deep and muddy. He pulled himself out and walked a short distance to a road where he sat down by some railings and removed his boots and his three pairs of socks. A man passed on a bicycle and looked back. But he apparently decided that an R.A.F. man in bare feet, wringing out three pairs of socks by the roadside, was nobody's business.

After walking a little further, F/Sgt. D heard a car approaching and he dived for a ditch. The car turned out to be an R.A.F. transport. After it passed, he again had to "ditch" for a second car. This time the car stopped about 30 yards up the road. The driver got out and looked around him. The driver, who was an A.R.P. man (apparently co-opted by the police), then got back into the car, turned it and drove about 30 yards past and in the opposite direction, where he again stopped. This time he looked along the ditch and F/Sgt. D was caught at 1150 hours.

* * *

F/O. E was dropped at 1000 hours, on the outskirts of a village, $7\frac{1}{2}$ miles from the aerodrome. He turned south and began to walk in the wrong direction. A "Fine day" from a passing villager was successfully countered by a grunt. Shortly afterwards he linked up with Sgt. F who had been dropped nearby, about the same time.

They turned east, travelling via fields and farm tracks, and were seen by several people, but without incident.

Approaching a farm they saw a man, apparently repairing a gate, but looking up every now and then to observe them. At the same time, the gleam of the sun on metal near a hedge startled them. The gleam was traced to F/Sgt. G who was wearing his whistle. They linked up and worked round to the back of the farm where F/Sgt. G left them.

F/O. E and Sgt. F proceeded along a grass ridge between two hedges in the direction of a town.

Just as the houses of the town were seen ahead, a man with a motor cycle was sighted near a telephone box. Almost immediately he was identified as a policeman and violent evasive action was taken.

Both were under the impression that they had not been seen and went back into a field. However, the policeman cut diagonally across the field to intercept them.

F/O. E and Sgt. F ran across the field at full boost. The policeman followed about 100 yards

astern and slightly to starboard. He was not gaining, but he fired short bursts of inaudible comment. Policeman reached P.L.E.—eventually turned on reciprocal and returned to base.

Unfortunately, F/O. E and Sgt. F found that their track was taking them into an Army encampment, so they turned south. Almost immediately an enemy formation of one man and a dog was sighted bearing 230 T. distance 100 yards.

Making a rate one turn to port, the two evaders were relieved to see the man give up pursuit. The man returned to the road and mounted a bicycle. He then proceeded to head them off by taking a side road. At the same time, an enemy Heavy Fighter Gruppe (two truck loads of soldiers) was sighted ahead.

Desperately turning north, F/O. E and Sgt. F crossed a road into a ploughed field. There was another alarm: a figure lurking in a hedge. It was their old friend, F/Sgt. G.

Another turn on their tracks and the two ran into a ploughed field in the centre of which were two furrows, somewhat deeper than the rest: only about 18 in. deep, but something to flop into.

For one hour and a quarter they stayed there, eating chocolate and watching military, civilians and police searching ditches and hedges around. At 1235 hours they decided to move, so they went to the bottom of the field, to a small stream, and tried to clean up.

When they moved out of cover, they were confronted by two soldiers moving down from the north, an officer from the east, two policemen from the south and a civilian from the west. Capture was inevitable.

* * *

F/Sgt. H, who was disembarked at 0950 hours, had no idea of his location. Later, when he traced out his path on a map, he found that he had walked in the wrong direction. Coming to a "T" road, he saw an army convoy proceeding along the top road, so he hid in a ditch. After the convoy had passed, he made his way along a hedge and passed an old yokel who greeted him with a "Good morning." The sun was shining and all was well so F/Sgt. H answered "Heil." There was no reaction but he admits that it might have sounded like "Hell."

Still walking south, he reached a gun site and began to crawl along a hedge. On the other side of the hedge was a farmer, ploughing. A dog barked. The farmer yelled at the dog, but did not see F/Sgt. H.

After a while he began to crawl once more and the dog barked again. F/Sgt. H stood up and waved. The farmer waved back.

Shortly after eight, workmen passed on cycles. F/Sgt. H let them all pass except the last. Then he pointed South and called out the name of his aerodrome. The workman shouted "No—that way" and pointed north. F/Sgt. H shouted "Danke" and turned on his tracks.

Next he met a steam lorry and jumped on the back of it. The lorry took him alongside the aerodrome where he jumped off and was immediately seen by a Flight Sergeant from his own Squadron, at 1330 hours.

* * *

F/Sgt. G, referred to in an earlier incident, was dropped at 0956 hours, seven miles from the aerodrome. He moved generally in a south-easterly direction and eventually, when near a farm, he saw a man repairing a gate. While watching him he was seen by F/O. E and Sgt. F. He also saw them. He thinks the glint of the sun on Sgt. F's crown attracted him. After leaving them at the back of the farm he approached an isolated cottage where an elderly lady came to the door.

F/Sgt. H said "Water, water" and the lady asked him where he came from.

F/Sgt. H assumed his best guttural voice to indicate an aeroplane. He waved his hands to represent an aircraft in flight, swept them downwards to the ground to indicate a crash and said "Finish. No good. Water."

The lady promptly made him a cup of tea. General conversation ensued and was contributed to by F/Sgt. H with the same monotonous grunts. He drank the tea quickly, said "Au revoir" and departed.

He walked boldly through a village without incident, turned north-east across the fields and crossed the canal by a bridge. He identified the village by means of a notice apparently relating to a village club.

He filled his water bottle from the canal and put in a Halazone tablet. He smoked a cigarette, gave the Halazone 20 minutes to work and then had a drink. He then proceeded to jump eight ditches in about a quarter of an hour. He was passing an isolated cottage in the back garden of which a woman was hanging out washing, when a policeman stepped out and arrested him at 1345 hours.

The policeman subsequently explained that when cycling past the cottage he saw F/Sgt. H in the distance, jumping a dyke. Knowing that the occupant of the cottage possessed field glasses, he went inside and borrowed them.

He watched F/Sgt. H for a long time, making his way via fields and hedges. He lost him once but soon picked him up again.

As F/Sgt. H appeared to be coming in the direction of the cottages, the policeman arranged with the lady with the washing to give him a tip when F/Sgt. H was level with the cottage. Her invitation into the cottage parlour was, therefore, not as innocent as he had supposed.

Although all eight members of the "crew" were arrested, it is felt that the conditions under which they operated were a little unfair. The warning broadcast was made too early, and in practice, on a protracted search, the whole of the R.A.F. Regiment Squadron could not be used to guard the perimeter.

The "captures" were awarded as follows:—Police 3; R.A.F. Regiment 3; A.R.P. 1; R.A.F. personnel 1.

Station Intelligence Officer's Comments

1. *Everyone was in too great a hurry.*
2. *The aircrew concerned should have concentrated their early efforts on getting away from their disembarkation point and so splitting the attention of the authorities.*
3. *Banking on the fact that enthusiasm wanes as the day wears on (and the feet get tired), it would have been better to hide up for a while after the initial move had been made.*
4. *F/Lt. B and P/O. A had a great chance, but they should have abandoned ship and hid in a haystack or barn before getting so near the aerodrome.*
5. *Everyone spent too much time on the roads.*
6. *Far too many risks were taken in the vicinity of villages.*
7. *Sun glints on whistles and crowns could have been obviated with a little mud.*

Leaves from a Navigator's Log Book—VI

There still seems to be considerable misunderstanding on the subject of track crawling, against which Coastal Command has recently taken a firm stand. One hears dismay, if not alarm, expressed on all sides by the "old sweats," to whom the track plot has ever been the beginning and end of all navigation. Some one has gone so far as to suggest that he can't see how a Navigator expects to arrive at his destination if he doesn't draw the track there from his starting point. How right he is! But, has it ever been suggested that the Navigator isn't to stick as closely to his ordered route as he can? The air plot has been made obligatory to all Coastal Navigators because it is the soundest method of ensuring that orders are complied with as accurately as possible and that Navigators do not simply fool themselves (and others) on this point. The classic reply of a raw Navigator who was being interrogated by an Intelligence Officer, manfully trying to complete the details of tracks and positions throughout a sortie for the Form Orange, sums up the case nicely for all track crawlers:—"I guess we went where we were told!" Such simple faith wants a lot of laughing off in the face of the latest evidence of D.R. navigational error in the Command.

Let it be admitted at once that in an ideal world there would be no advantage in keeping an air plot, since a track plot is all that would be wanted. But in an ideal world there would be no wind, or at least no wind changes! The comparison of merits of the air plot and of the track plot *in vacuo* therefore leads us nowhere. Fundamentally, they are both correct, for are they not both rooted in the good old triangle of velocities? In fact, at first sight the track plot is preferable because it seems to tell you where you are without further to do. The whole snag lies, however, in its practical application and in the very bad habits induced by over emphasising maintenance of track at the expense of other considerations.

To deal with the pitfalls of practical track crawling first, the Navigator works out a course to make good his required track, sets it on the pilot's compass, and calculates his ground speed so as to obtain an E.T.A. He might check his drift, as a first precaution, to satisfy his finer feelings; but after that he begins his vigil of hoping for the best. After a while, depending on his mental alertness, he has another goof through the drift sight and finds that the drift has changed, perhaps by as much as two or three degrees.

He can't keep his eye glued on the drift, so even if he takes one every 10 minutes, which is a bit of a strain after, say, 12 or more hours' flying, from time to time he is bound to find the drift has changed in the interval. When did it actually change? He doesn't know, but he passes up an alteration of Course to the pilot, to allow for the new state of affairs, and Bob's your uncle, he thinks he is maintaining track as required.

It's as well to pause here and consider whether or not this simple process actually results in making good the desired track. Track crawlers will tell you it does. We think otherwise, since every drift change is observed too late for the simple alteration of Course to allow for it properly. The change may have taken place at any time in the intervening period and although just one delayed drift will not put the aircraft much off track, several will do so. Indeed, during a normal sortie drift changes to and fro quite frequently, and it would be a clever man who could say exactly how much off track the aircraft was, or even to which side these many changes have carried the aircraft. The track crawler goes gamely along a series of tracks, each parallel with the required track to start with, but each trailing off with the unobserved effect of drift change. So much for the belief that the aircraft will remain on track by track crawling!

Now, where is he along his hoped-for track, while all this is in progress? As every A.T.C. cadet knows, a change of drift indicates a change of wind, which may well mean a change of ground speed. Since the track crawler can't say exactly *when* the drift changed, he can't say when the ground speed changed—if at all. Thus he cannot say to himself: "I am *here* now. I am altering course to compensate for the new drift, so that my new ground speed will apply from *this* point." In other words he can't say where he is along the track he so fondly imagines he is following. You can easily imagine what the effects are of trying to make good other tracks in the sortie, when the E.T.A.s at the turning points are so very vague. They often result in Parallel Sweeps more resembling Cross-Overs, and in searches for convoys starting at the wrong place and ending fruitlessly. (They do not usually end in bad landfalls and bad final E.T.A.s.)

Since track crawling clearly does not enable the Navigator to keep on track, and since he can never know—except very roughly—how far he has gone anyway, because of the irritating habit of the wind to change, he doesn't seem to have much to commend it as a practical method of navigation. No doubt it came into such general acceptance in the Command, because its real limitations were not understood and because the sorties undertaken by the Command such as searches, patrols and sweeps, demand close adherence to clearly defined tracks. The adoption of track crawling methods was as much to be regretted as any wishful thinking. The present day policy is designed to face up to realities by finding out *how far off track* the aircraft gets on account of wind changes, and only then altering Course. Pilots cannot steer over short periods to within 1° of a given Course anyway, and hence repeated changes of 1° only result in annoying everyone concerned, without material benefit being gained. By knowing how much he is off track, the Navigator can easily take steps to return to the proper track or make good his destination as he thinks best.

Unfortunately track crawling methods lead to worse troubles than mere self illusion. Because the Navigator believes he is on track, he is not willing to quit track on any "crank idea" of getting a Three Course wind. Rather he will soldier along using that abomination of desolation, the Drift and Wind Lane method, better known as simply honest-to-goodness "estimation." Moreover, because he honestly believes he is on track, he will reject any fix that tells him he is off track, even though we know he has a 50-50 chance of being on either side of the required track by more than 3 per cent. of the distance flown by D.R. navigation. Worse than this is the accompanying feeling of self-satisfaction which robs the struggling Navigator of the incentive to improve his art. There on his chart is a single line that represents both the track to be followed *and* the track made good. Why should he care about fixes and position lines. Why bother about an accurate wind? After all, the Pilot will probably complain if he is asked to do a 60° dog-leg. Besides, the track is all nicely marked off at 10 minute intervals, so that the Captain can be told exactly where he is at any time with only a little interpolation. *Exactly, where he is . . . ?* Well, what would you say, Chums?

A LETTER FROM THE ROYAL AIR FORCE TO THE MERCHANT NAVY

*The following article is being distributed, as a booklet, to the crews of merchant ships,
with a view to explaining the truth about the best use of aircraft for their protection.*

One of the most important responsibilities of the Royal Air Force, and particularly of Coastal Command, is to assist in the safeguarding of convoys against attacks by U-Boats. And it is rightly regarded as such by the aircrews employed on this duty, for they, better than any other non-seafaring folk, know the dangers and difficulties with which you are faced in keeping open our communications across the Seven Seas.

2. This booklet has been written to show the principles of the operation of aircraft against the U-Boat and to explain why it is they often do their work out of sight of the convoy itself. Reports from ships returned after an ocean crossing often contain remarks that the convoy was not met by aircraft or register the relief felt when this has taken place. We appreciate the confidence you place in aircraft, and we hope that facts fully justify it. We regret, while perfectly understanding it, the anxiety which you feel when the expected aircraft fails to come into sight. What we would have you believe, and we hope to convince you by some of the examples given below, is that even though they are too far away for you to see them, aircraft of Coastal Command are working ceaselessly against our common enemy, the U-Boat.

3. The first comparison can be drawn between the workings of Coastal Command aircraft and something which is within common knowledge, the Police Force. You do not find a policeman standing in front of every door to prevent burglary or murder. To begin with, there are not enough policemen to do this, and standing at the front door will not prevent a sneak-thief from stealing the washing off the line at the back.

4. When there was a wave of crime after the last war, no attempt was made by the police authorities to give close protection to every valuable piece of property. Instead, they formed "flying squads" which sought out and captured the criminals in their hiding places. In exactly the same way the "flying squads" of Coastal Command aircraft do not normally attempt, except when the convoy is definitely threatened, to give close protection to the convoys. They fly about deep out in the Atlantic and in the Bay of Biscay, seeking out and destroying the U-Boats wherever they find them.

5. Another illustration can be taken from the evacuation at Dunkirk. After this evacuation there was a feeling that the R.A.F. might have done more to protect our soldiers waiting to embark in the ships which came over to fetch them.

It is easy to see how this arose. The troops were crowding on to the beaches and docks; and from time to time a German would slip through and bomb or machine-gun them. "Where are our fighters—why don't they bring him down?" was the very natural reaction. In point of fact, fighters were waging a grim battle against dozens of enemy aircraft perhaps twenty or thirty miles away; and by their efforts saved the waiting soldiers from mass bombing on what would have been a disastrous scale. Doubtless the individual soldier would have felt happier in his own mind if he had seen squadrons of fighters circling over his head; but he would not have been safer. When the overwhelming German force attacked, the battle would have taken place over the target, and for every aircraft brought down, ten or more would have got home their attack. There would have been no evacuation, and perhaps the war would have been decided two years ago and not in our favour.

6. Now exactly the same principle applies to the safeguarding of convoys. There are three ways in which the U-Boat can be attacked:—

- (a) In the shipyard where it is built;
- (b) In the bases where it refits and where the crew rests, such as the Bay of Biscay ports;
- (c) At sea.

7. The American and British bombers have got the first two of these in hand. There are already signs that the bombing of the U-Boat yards and bases is having its effect.

8. At sea, the U-Boat can be attacked either in transit from its base to its patrol area or when the U-Boat pack is gathering to attack a convoy. Every day and every night when flying is possible, and Coastal Command fly in pretty bad weather, the Bay of Biscay, which is the main transit area, and the waters to the North of Scotland are constantly patrolled by numbers of Coastal Command aircraft.

9. Every U-Boat seen is attacked, sometimes with success, and in any event is forced to dive. When a convoy is threatened by shadowing U-Boats, a striking force of Coastal Command aircraft is sent out at once to break up the pack and so protect our ships. Our seamen sometimes may not actually see the aircraft—they may be hunting down the U-Boats miles away from the convoy. But they are there, and the results as

far as the convoy is concerned may even be more effective than if the action were taking place within visual distance of the convoy.

10. There is another point which we should like to mention. You probably know the number of convoys which sail from your own port. You know there are many other ports from which convoys sail. Therefore the number of convoys at any time is bound to be large.

11. It is not difficult to give air escort to a convoy when it is near the Coastal Command bases, but usually it is not threatened when it is close in. In these areas air escort is a waste of time even though it may be easy. Far out at sea it is obviously more difficult to give close escort, and requires a larger number of aircraft. It is not an easy job of navigation for an aircraft to pick up a convoy in bad weather hundreds of miles out. And the flight out and back takes up a high proportion of the petrol load. This "dead" time therefore necessitates the use of a large number of aircraft to give escort to a convoy which is far from our shores. For example, suppose an aircraft flies at 150 knots and has an endurance of 16 hours, it can remain for only two hours on a convoy 1,000 miles from its base. To keep this up for, say, 14 hours of daylight means that seven aircraft will have to be used for that one convoy alone.

We have not got unlimited numbers of aircraft. And if we were to attempt to give close escort to all convoys within our range the result would be that we should have none to spare to deal with the U-Boat anywhere but immediately round the convoys. He would be able to travel out from his base on the surface and the packs would be able to collect without even having to worry about air attack. And, in consequence, not only would there be more convoys attacked but the attacks would be in greater strength.

12. So our aim is first to prevent U-Boats ever getting contact with convoys, by finding them and harrying them on their way out or in the areas where they lie in wait for the convoy; and secondly, when they do get contact with the convoy, to break up the packs, force them under, stop them keeping pace or racing ahead on the surface to get into a good attacking position ahead, guide the surface escorts to them and, of course, whenever possible to kill them with a nicely-placed stick of depth-charges.

The second can be very effective, and you can actually see and experience the results when the Liberators or Sunderlands or Fortresses come out to you hundreds of miles out in the Atlantic when the U-Boats are at you. But we can't do without the first; and you may be sure that the hundreds of sweeps which are done every month in the BAY, in the NORTHERN passage and in the Eastern half of the Atlantic have a very real effect in killing U-Boats, forcing them back to port to repair damage, wearing down the nerve of the crews and reducing the threat to the convoys.

You know as well as we do that the sea is a big place, and you will understand that it is not possible to locate and attack every U-Boat. Yet, from the beginning of the war a Coastal Command aircraft has sighted a U-Boat on the

average every day and attacked one every other day. And of those attacked one in every five has been sunk or damaged to some extent. The result is clear to see—your own confidence in aircraft is evidence enough, and the fact of the number of sightings within aircraft range and when aircraft are flying, confirm this.

13. Let us now take one or two of your own comments on the activities of Coastal Command aircraft and see what, in fact, was happening.

14. A ship in October reported:—

"Air escort was provided from the other side and convoy was escorted to a distance of about 400 miles out from the American coast, but no air escort was met on this side."

This convoy was close escorted up to October 12, but this did not prevent a pack of U-Boats shadowing and attacking as soon as the escort was withdrawn, when the ships passed out of range of shore-based aircraft.

The convoy was picked up by a British Liberator from Iceland, 750 miles away, on October 15, which attacked a U-Boat just astern of the convoy and, with a second Liberator, kept touch throughout the hours of daylight. On the 16th another Liberator sighted a U-Boat five miles astern of the convoy, and a second attacked a U-Boat north of it. Touch was maintained throughout the 16th. On the 17th a Liberator again was in the area for the greater part of the day.

Nor was this all. Aircraft (Catalinas) of a U.S. Navy Squadron in Iceland were unable to reach the convoy, but patrolled as far south as their range permitted on the 16th and 17th. They made three attacks on U-Boats which, without doubt, were hastening to cut off the convoy farther westward but did not succeed in doing so. On the 18th the weather deteriorated so that air cover could not be given until the convoy reached 10 degrees W. In all, the aircraft based on this side of the Atlantic made five attacks on U-Boats round this convoy. No attacks were made by U-Boats on the convoy after aircraft had appeared on the scene.

15. The following is a statement by the Master of one of the ships in a Sierra Leone convoy:—

"After Freetown and Bathurst, aircraft left the convoy. No aircraft was seen until 31.10.42, when a Sunderland (?) was seen. No other escort was seen until the ship was in the North Channel."

Coastal Command aircraft picked up the convoy from Gibraltar. On this occasion gales at Gibraltar prevented an aircraft taking off until 1300 hours, 31/10, when two Catalinas joined the convoy and stayed there until 0830 hours on the following day. Another two were on from 0100 hours 1/11 until 0200 hours on 2/11, and a further two from 0110/2 until 0300/3/11. The convoy was then 600 miles from Gibraltar. From 0915/3 to 1045/3 a Liberator from U.K. escorted it, and a Halifax joined it from 1512/3 to 1640/3. The short times on the convoy were due to its being more than 600 miles from the U.K. when first met. Thereafter aircraft were continually in the vicinity of the convoy until it was out of danger, West of Ireland. This convoy had suffered heavy losses by U-Boat attacks, but as soon as aircraft got out to the vicinity of the convoy the attacks ceased and the pack melted away.

16. The history of these convoys has been given in some detail; they are two out of a great number which it would only bore you to repeat, for the story is much the same and the results identical. The lesson is this: aircraft work in aid of the convoy where the U-Boats are concentrating for the attack, shadowing and manœuvring for position. When aircraft arrive on the scene the U-Boats disperse. This has been proved time and time again and is beyond doubt. You can be sure that if your convoy is in any way threatened, and provided it is humanly possible to get an aircraft to it, aircraft of Coastal Command will be somewhere near. They may be out of sight, for they must be where the U-Boats are, harassing them, putting them down and, above all, killing them.

17. There is another reason why perhaps you do not see aircraft close to the convoy, especially in bad weather. An aircraft moves rapidly, and it is fatally easy in a few minutes' flying for the aircraft to get over the convoy. The inevitable then happens—the number of Coastal aircraft brought down or damaged by our own ships during the last twelve months is as distressing as you would find it surprising. Recognition and being recognised by the convoy is a difficult matter for both; we know how you feel and that you must act quickly; we regard this as a risk of war, but it is one we don't want to go out of our way to take. And so when conditions are

bad you must expect aircraft to give you a wide berth to say the least. Your shooting is too good and too quick.

18. And so what it comes to is this. The danger to the convoy is like a growing storm which gathers at a distance and takes time to develop. We endeavour to attack the U-Boat while he is still far away from you and when he is making his way towards you. When he gets contact with you, then whenever humanly possible we shall be with you. We cannot afford to escort you when you are not threatened. And even when we know U-Boats are in your neighbourhood most of our effort goes to seeking them out at some distance and out of your sight. We know from experience that this is the best we can do for you, and gives you better protection and kills more U-Boats than if we tried always to have an aircraft flying round and round the convoy. It is so good that it has broken up dozens of attacks, and for this reason you would not wish us to operate otherwise. When there is any sign of a threat to you, Coastal Command aircraft will be near you if flying skill is all that stands between you and their base; and if you are not too far away. At 600 miles, 700 miles, and in some cases at over 1,000 miles the U-Boat has been surprised by aircraft and forced to give up his attack, and the convoys have come through.

May, 1943.

Wings for Victory

The watchword to-day is *SAVINGS*. On all sides, both Servicemen and Civilians are being urged to save money, paper, tins and even bones. All these commodities are potential aircraft. But, while this nation-wide drive is going forward, the Squander Bug is loose in the R.A.F., breaking aeroplanes and wasting the savings and salvage of the community in a second of time.

Each station or squadron regards any contribution it may make to the "Wings for Victory" campaign as a help to the war effort, but conveniently overlooks the fact that each accident on the station will wipe out the station savings for years past and years to come.

All this has its moral for flying crews. Figures show that every day, somewhere in this Command, there are two accidents which could have been avoided if more care had been taken. On an average these two accidents together cost £30,000.

During each month, this Command contributes about £10,000 to War Savings Certificates. Thus, in one day three times the total savings of the Command in a month are frittered away through carelessness.

Next time you are in a hurry and decide to cut across the grass at an airfield where it is forbidden; or when you think that there is plenty of room to pass that other aircraft; or after overshooting, you cannot be bothered to go round again; just pause and count the cost. It all seems so easy at the time. If you taxi off the runway into a rut and fracture the

undercarriage, or if you allow the aircraft to swing while taking off and damage is done, within a few days a new aircraft arrives and all is well with you. But some other fellow is going short.

Obtaining aircraft from 41 Group is like buying food or drink in war-time. There is only a certain amount, and you cannot afford to waste it. If you get your glass refilled these days, without doubt it is at the expense of somebody else. That new aircraft may have been intended for North Africa; it may have been intended for a new squadron, or it may have been intended for the O.T.U. to train more crews for your squadron. Whichever it is, the unassailable fact remains an aircraft has been wasted.

Great care is required in flying modern aircraft. Forgetfulness can be vital. There are the pilots who forget to ensure that the pitot head cover is off before they take off. There are pilots who forget to ensure that the undercarriage is locked down when they land. And there are pilots who attempt to take off with the propeller in coarse pitch. All these lapses involve serious consequences, as serious in many cases as those when a man forgets to check that his gun is unloaded before showing it to a friend, or the man who, crossing Piccadilly in peace-time, forgets to look to his right to see if the way is clear.

Nor is the lack of care always on the part of the pilot. There have been Navigators who, through carelessness, have lost valuable aircraft;

and gunners who, through stupidity, have damaged their own aircraft.

You may say that these are all extreme examples and that they are not the sort of thing you would do. Nevertheless, the cold hard fact remains that half the accidents in the Command are due to carelessness, over-confidence, or disobedience.

Do you remember the film, "*P/O Welwyn*"? If you do, you will recall that the mythical squadron kept a board showing the individual profit and loss account, crediting each pilot with his kills in terms of £ s. d. and, more important, debiting him with his "Prangs." This is not a bad idea, and might well be adopted universally. In a

number of squadrons, this suggestion would undoubtedly result in an adverse balance.

Though history abounds in gallant actions, where the "few" come out victorious, in spite of overwhelming odds, these are merely incidents, as wars are invariably won by the side that shows the better "bank account": the side with fewer debits.

When you think about it, there are two ways of ensuring that we have the largest possible number of Wings for Victory: one by providing the money to build more and more, and the other (more important from your point of view) is to see that the Wings with which you fly are preserved for Victory and not wasted for Defeat.