

The Battle for Convoy ONS-154, 26-31 December 1942

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According to Winston Churchill, U-boats represented the "worst" threat to Allied victory in World War II.¹ For the Allies to be victorious, they had to defeat the U-boats and to win the Battle of the Atlantic. The effects of an Allied defeat at the hands of the U-boats are beyond calculation: had it happened, Britain would have been forced out of the war; there would have been no aid to Russia or Allied invasion of the Mediterranean in 1942; and the invasion of northwest Europe would have been impossible in 1944.

At the end of 1942 the Battle of the Atlantic entered its critical stage when the Germans attempted by means of U-boat wolf pack attacks to sever the Allied convoy routes between North America and Britain.² In a series of hard-fought convoy battles between December 1942 and May 1943, German U-boats contested with the Allies for control of the North Atlantic sea lanes.³ One such battle was fought in December 1942 between U-boats and Canadian warships escorting Convoy ONS-154.

Convoy ONS-154, comprising forty-six merchantmen, sailed from the western entrance of the North Channel for North America on 19 December. The convoy was accompanied by Escort Group (EG) C-1, commanded by Lieutenant Commander Guy Stanley Windeyer, RCN, which consisted of the destroyer HMCS *St. Laurent* and the corvettes HMCS *Battleford*, HMCS *Chilliwack*, HMCS *Kenogami*, HMCS *Napanee* and HMCS *Shediac*. While EG C-1 appeared on paper to be a mighty force, in reality it was fraught with "many difficulties and deficiencies" as a fighting force. For example, one destroyer, HMS *Burwell*, which was initially assigned to it, did not sail with the convoy because of needed repairs. Moreover, the ships of EG C-1 had never exercised together; the commanding officer of the force was newly appointed; and there was no conference about tactics among the officers before sailing. Although its orders were based on the *Atlantic Convoy Instructions*, three of the ships — HMCS *Napanee*, *Kenogami*, and *Shediac* — had not been issued this document. Further, it was discovered that a number of officers, including the vice commodore of the convoy, had not been given instructions. The failure of HMS *Burwell* to appear and the lack of proper instructions, according to Windeyer, "necessitated hurried re-organization, and passing of orders at sea." In addition to "this unhappy lack of organization," through a series of accidents and misadventures ONS-154 sailed without a properly functioning high frequency direction finder (HF/DF). HMCS *St. Laurent*, owing to an accident and the press of time, not only sailed without

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its HF/DF officer but also failed to calibrate its HF/DF set, which rendered the instrument next to worthless. The convoy's rescue ship, *Toward*, was equipped with an HF/DF set, but not with a gyro compass, a state of affairs that made any bearings that it might obtain using HF/DF suspect. Finally, although the ships of EG C-1 had all been fitted with Type 271 radar sets, the operators were not wholly familiar with the equipment.⁴

After entering the North Atlantic, ONS-154 turned to the southwest, heading for North America by the southern Great Circle. This route was chosen so that eighteen merchantmen bound for the South Atlantic could be detached from the convoy. But this course would require the convoy to cross at its widest point the sector of the North Atlantic where it could not be supported by shore-based anti-submarine aircraft. On 23 December, ONS-154 encountered heavy weather, which scattered the ships; but with the exception of two merchantmen, the convoy soon reassembled. On 26 December, just as U-boats intercepted it, ONS-154 passed beyond the range of Allied shore-based anti-submarine aircraft.⁵

The Germans had foreknowledge, most likely from communications intelligence, of the convoy's movements and expected to intercept it as early as 23 December.⁶ The BdU (*Befehlshaber der Unterseeboote*) intended to use two groups of U-boats, consisting of eighteen German vessels, code named *Ungestum* and *Spitz*, to the northward of the track of ONS-154.⁷ The ten U-boats of the *Spitz* group deployed into a patrol line stretching from 54°09'N 24°45'W to 52°27'N 21°55'W, while the eight *Ungestum* submarines established a patrol line from 50°21'N 32°15'W to 48°09'N 29°55'W.⁸ Not encountering the "expected" convoy, the Germans thought it had been delayed by bad weather. The *Spitz* group was then ordered on to a course of 200° at a speed of seven knots. On 26 December the *Spitz* and *Ungestum* groups were ordered to "remain as patrol line in area you have reached" and at the same time informed that the "convoy might pass as early as today." At 1756 the same day, with a visibility of about eight miles, *U-664* sighted ONS-154 at 48°15'N 23°55'W. The BdU ordered it to shadow the convoy while directing the seventeen other U-boats to close with ONS-154 and to attack.⁹

Meanwhile, on 13 December the British had broken the codes used by the Germans to communicate with their U-boats, and both the British and Americans were systematically reading the coded radio messages to and from U-boats in the North Atlantic.¹⁰ On the basis of information obtained from communications intelligence at the time ONS-154 was proceeding southwestward from the North Channel, Allied intelligence estimated that there were some thirty U-boats in the North Atlantic north of 45°N and between 25° and 40°W. On 22 December, by means of shore-based radio direction finding (D/F), the Allies had located *U-524*, one of the *Ungestum* group, at 47°45'N 35°W while that U-boat thought its true position was 49°00'N 38°05'W. It is obvious that ONS-154 had been routed to pass to the east and just to the south of the suspected position of the U-boats. But there were delays in the decoding process which meant that the Allies did not decode the German orders, which would have shown the assigned position of the *Spitz* and *Ungestum* groups on 26 December, until after *U-664* intercepted the convoy. Nevertheless, ONS-154's route still lay slightly to the south of the assigned position of the U-boats when it was sighted by *U-664* which, likely due to a navigation error, was some fifty miles south of its assigned position at the southern end of the *Spitz*

group patrol.¹¹ The interception of ONS-154 was more a result of bad luck and a mistake in navigation by *U-664* than to a failure of Allied intelligence.

On 25 December the Admiralty informed Windeyer by radio that a U-boat, probably *U-524*, had made a radio transmission within a hundred miles of 50°00'N 21°30'W. The next day the presence of U-boats near ONS-154 was confirmed when an Allied anti-submarine aircraft, some twenty miles astern of the convoy and operating at the extreme limit of its range, attacked *U-662*, forcing it to submerge. Shortly thereafter, at 2140, HMCS *Shediac* sighted a U-boat off the convoy's port bow. This was *U-664*, the shadower, which was attacked by HMCS *St. Laurent*, forced to dive, and then lost contact with ONS-154. After an unsuccessful hunt for *U-664*, HMCS *St. Laurent* returned to its position in the screen of ONS-154.¹²

At 0044 on 27 December *U-356* made contact with ONS-154. It is probable this U-boat entered the main body of the convoy and at 0205 torpedoed and sank the merchant ship *Empire Union*. In rapid succession it also torpedoed and sank *Melrose Abbey* and *King Edward*, while damaging the merchant vessel *Soekaboemi*. When *U-356* began to launch torpedoes, Windeyer ordered the rescue ship *Toward*, screened by HMCS *Napanee*, to pick up survivors from the merchantmen. A number of Allied merchant seamen were thus rescued, while the wreck of *Soekaboemi* drifted astern of the convoy and was later sunk by *U-441*."

At 0330 the *St. Laurent* obtained a radar contact and then sighted a U-boat "on the surface trimmed down and moving fast into the convoy." *U-356* was fired at by *St. Laurent's* 20-mm. Oerlikons and one of the destroyer's main guns. The men on the bridge of the Canadian warship were temporarily blinded by the flash of the 4.7-inch gun. After regaining their eyesight, they saw a periscope moving from right to left across their bow. The *St. Laurent* immediately attacked with depth charges. Windeyer later thought that the U-boat was "inside the diamond" of the exploding depth charges. HMCS *St. Laurent* ran out, turned, and then attacked a second time with ten depth charges. Eleven explosions were heard on board the destroyer, the last of which was "delayed and intensive." A third attack was mounted on the U-boat, "which appeared stopped." Just before undertaking this third attack, the Canadians observed a large oil slick off *St. Laurent's* port bow. Immediately after completing the third attack, *St. Laurent* lost electrical power, leading Windeyer to conclude that the U-boat had escaped. This, however, was false, for *U-356* had been destroyed.¹⁴

At 0615, after regaining electrical power, HMCS *St. Laurent* obtained a radar contact, which was probably *U-406*. The target was closed upon, a U-boat sighted, and fire opened with the ship's 20-mm. Oerlikons the U-boat submerged. A sonar contact was not obtained and *U-406* escaped.¹⁵

During the afternoon of 27 December HMCS *Chilliwack* was refuelled from the tanker *Scottish Heather*. Several unsuccessful attempts to refuel from this tanker had been made before the U-boats made contact.¹⁶ The failure likely was due to the cumbersome method adopted by Commonwealth navies of refuelling warships at sea using a hose trailed astern of a tanker.¹⁷ As *Scottish Heather* was refuelling *Chilliwack*, both ships dropped astern of the convoy; at 2040, eight miles behind ONS-154, *U-225* torpedoed and

damaged the tanker. *Chilliwack* sighted the submarine and chased it unsuccessfully. The damaged *Scottish Heather* limped back to the Clyde.¹⁸

Meanwhile the Admiralty, on the basis of shore-based D/F bearings, estimated on 27 December that there were three or four U-boats in contact with ONS-154 and that another six enemy vessels were within 110 miles of the convoy. The BdU, on the other hand, believed that the U-boats might be in contact with some Allied formation of ships other than the main body of ONS-154. At 1426 the U-boats were directed due to poor visibility to "use hydrophones as much as possible." They were also told that "if you are in contact report immediately." At 1435, *U-225* reported ONS-154's position as 46°57'N 26°15'W. During the next several hours *U-225*, *U-260* and *U-406* reported contact with ONS-154.¹⁹

Early in the evening of 28 December, HMCS *St. Laurent* obtained a number of HF/DF indications of U-boats astern of the convoy. Later that same evening a radar contact was obtained. Then the *St. Laurent* sighted a U-boat, forced it to submerge and attacked unsuccessfully with depth charges. During a sonar hunt for this sub, the *St. Laurent* fell astern of the convoy; as it was steaming to rejoin the screen of the convoy, the destroyer came across HMS *Fidelity*, which had also fallen astern of the main body of ONS-154.²⁰ The ex-French merchant ship *Le Rhone*, which had been commissioned into the Royal Navy as a special service vessel with a Free French crew, *Fidelity* carried two float aircraft; at Windeyer's urging, the special service vessel attempted to launch an aircraft to spot U-boats in the vicinity. This effort failed when the aircraft hit *St. Laurent's* wake and sank. As *St. Laurent* was picking up the aircraft's two-man crew, the U-boats began to attack ONS-154.²¹

At 1920, HMCS *Battleford* sighted an object on the surface. The corvette turned towards it, obtaining a radar contact; two minutes later it sighted four U-boats in what appeared to be a line-abreast formation approaching the starboard side of the convoy. *Battleford* ran out towards two of the subs and attacked them with gunfire as they submerged. Shortly thereafter *Battleford's* radar went dead owing, it was thought, to the jarring from firing the ship's main armament. Next the Canadian corvette attempted to regain its position in the screen of ONS-154, but unknown to the captain, the convoy had altered course. The result was that for the rest of the night *Battleford* was not on station on the starboard side of the convoy.²²

In the absence of *St. Laurent* and *Battleford* from ONS-154's screen the Germans, beginning at 2005, attacked the convoy, overwhelming the four remaining corvettes. First, *U-591* torpedoed and damaged the merchant ship *Norse King*, which was finished off the next day by *U-435* while attempting to reach the Azores. Next, *U-225* hit *Melmore Head* with two torpedoes, causing it to explode. Two minutes later, the same U-boat torpedoed and damaged *Ville de Rouen*, which was later sunk by *U-662*. *Empire Wagail* was sunk next by *U-260*, while *U-406* damaged *Baron Cochrane*, *Lyton Grange* and *Zarian*, which were later sunk by *U-123*, *U-628* and *U-591*, respectively. Then *U-225* torpedoed and damaged both *President Francqui* and *Empire Shackleton*; the former was later sunk by *U-336* while the latter was finished off by *U-435*. Within two hours, four U-boats — *U-591*, *U-225*, *U-260* and *U-406* - had torpedoed nine ships in ONS-154.²³ Lieutenant

Stuart Henderson, RCNR, commander of HMCS *Napanee*, described the attack as "a holocaust" during which:

[a]ll ships appeared to be firing snowflakes, and tracers crisscrossed in all directions, escorts firing starshells. The sea was dotted with lights from boats and rafts, and two burning wrecks which had hauled out to starboard helped the illumination, although one of them was pouring out dense black smoke.²⁴

This was the greatest disaster in the history of the Royal Canadian Navy.

After studying radio reports from the U-boats, the BdU concluded that the attack on ONS-154 during the night of 28 December was a "great success," for it thought that fifteen ships totalling 84,000 tons had been destroyed. The BdU also believed that the U-boats had eluded the convoy's "remote escort" and that ONS-154's "close defence" was "as good as useless because of the surprising mass attack made by the U-boats." It was a great victory for the U-boats and the BdU wished to continue the operation and destroy ONS-154 completely. But a number of U-boats were running short of fuel and the BdU was, in the aftermath of the attack, forced to divide its forces. Those U-boats which were short of fuel were ordered to break off operations and, while waiting to be refuelled at sea, to sweep slowly back through the battle area searching for damaged Allied ships. At the same time, the attack on ONS-154 would be continued by those subs which still had sufficient fuel. The Germans believed that ONS-154 had been "routed" and that its ships were scattered. The U-boats were ordered to "kill the rest of the convoy."²⁵

In the early morning of 29 December, the scattered ships were reformed by the escorts into their proper positions. At the time, HF/DF "intercepts indicated" that there were still several U-boats astern. At 0835 HMCS *St. Laurent* conducted a sweep astern to a depth of ten miles, but no U-boats were encountered. Nevertheless, Windeyer "[f]elt certain that the U-boats were gathering astern for a conference and to count losses."²⁶

There were no successful attacks on the main body of the convoy during 29 December. HMCS *Napanee* spent most of the day being refuelled from the tanker *E.G. Suebert*, a process that was complicated because the hose broke several times. At 1300 *St. Laurent* received a radio message from HMS *Fidelity* stating that it had fallen behind the convoy due to engine problems and that it was proceeding independently to the Azores. About three hours later *Fidelity* radioed that it was being attacked by U-boats. By falling astern of ONS-154, *Fidelity* had entered the area being searched by U-boats for damaged Allied ships. Equipped with anti-torpedo nets, *Fidelity* proved difficult to sink. Attacked first on 29 December by *U-225*, then by *U-615* with five torpedoes, the vessel was finally sunk at 1638 on 30 December by two torpedoes from *U-435*. After sinking *Fidelity*, *U-435* reported to the BdU that there were "300 or 400 survivors on rafts...floating in the water;" few were expected to survive.²⁷ This was the last successful attack by the U-boats on a ship belonging to ONS-154.

At 1650 on 29 December, the destroyers HMS *Milne* and HMS *Meteor* joined the escort of ONS-154, having been detached from Convoy MKF-4. Immediately after making contact with ONS-154, the two British destroyers conducted sweeps ahead of the convoy. During this exercise, a U-boat fired three torpedoes at *Milne*, but all passed in

front of the destroyer at a distance of about five cables. *Milne* and *Meteor* had properly functioning HF/DF sets which during the night showed many "indications of the presence of U-boats in the vicinity of the convoy." The tactics used that night were to "sometimes close on the bearing, and always to fire starshell on the bearing." *U-662* reported to the BdU that "approximately every half hour single star shells."²⁸ These tactics were apparently successful, for no attacks materialized on ONS-154.

Even though *Napanee* had received thirty tons of fuel from the tanker *E.G. Suebert*, a number of other escorts were running short. The expected deterioration of weather appeared to preclude any further attempts at refuelling the escorts at sea and at 2359 *Battleford* and *Shediac* were detached to steam to Ponta Delgada in the Azores to refuel. Next day *Milne* and *Meteor*, after remaining with ONS-154 less than twenty-four hours, were also detached to refuel in the Azores. These losses greatly weakened the escort, and Windeyer believed that the night of 30 December "would see our final carving, with only four escorts to take the bowling." Yet no further attacks took place and only one U-boat was encountered during the night.²⁹

On 29 and 30 December the U-boats maintained contact with ONS-154. But for various reasons many also lost contact. For example, *U-435* reported that it was "discontinuing;" *U-123* reported losing contact with the Allied ships; *U-435* went off in pursuit of a lone ship; and *U-591* broke off the operation because of a lack of fuel. The BdU wanted the U-boats to continue to attack ONS-154, but more and more of the German vessels, mostly because of a shortage of fuel, broke off and dropped astern of the convoy. At 1727 on 31 December the BdU was forced to end the operation.³⁰

The battle for ONS-154 was a German victory. The U-boats sank fourteen Allied merchantmen and damaged another out of the forty-six ships which had originally sailed. Only one U-boat was sunk. The Germans, with what Allied intelligence characterised as "a U-boat pack of a strength which may frequently be mustered in the North Atlantic," had overwhelmed a "fairly typical surface escort," consisting of a destroyer and five corvettes, to savage the merchant ships in ONS-154.³¹ The Germans were the victors not because the U-boats employed new tactics or had taken the Allies by surprise but because of Allied errors that permitted an EG and a convoy to be overwhelmed by a typical wolf pack attack.

The great mistake of Allied planners was to send ONS-154 to North America via the southern Great Circle. The planners in 1942 essentially had two choices: the northern or southern Great Circles. A convoy using the northern route would be able to receive air cover from aircraft based in Newfoundland, Iceland, and Northern Ireland and would only be without such support in the area south of Greenland, but a convoy on the southern Great Circle would have to traverse a much longer distance without air protection. ONS-154's route along the southern Great Circle meant that it passed out of the range of Allied anti-submarine aircraft just as the U-boats made contact on 26 December; the convoy's escort thus had to fight the U-boats without air support. Yet it was well known to Allied staff officers and planners that air support was essential to the defense of a convoy under attack by a group of U-boats. Not only could aircraft sink the enemy vessels but their mere presence had an inhibiting effect on U-boats.³² Apparently, the need for air cover was disregarded in this instance because of the desire to detach a number of merchantmen

for the South Atlantic. Nevertheless, the choice of a southerly route across the North Atlantic was an error. As Allied intelligence noted:

All experience of convoy engagements with U-boat packs indicates with increasing emphasis...that heavily concerted attacks by considerable numbers of U-boats can be and usually have been prevented if aircraft are in company with the convoy but that beyond a certain point of saturation a surface escort alone cannot hold its own against any force of U-boats which outnumbers the escort in a ratio of two to one.³³

The great value of air support to a convoy under attack by a group of U-boats was well known in the Admiralty even before ONS-154 sailed.³⁴ Yet the convoy was dispatched without it. Moreover, even after the mauling of ONS-154, Admiralty planners still neglected this basic principle. In January 1943, for example, Convoy TM-1 was almost destroyed by U-boats while proceeding, without air cover, between Trinidad and Gibraltar.³⁵ The routing of ONS-154 into an area without air support, near to a known concentration of U-boats, was an Allied strategic mistake of the first order.

Still, the disaster might have been mitigated somewhat if EG C-1 had been more professional and effective. C-1, as with many other Canadian EGs during 1942, lacked the training, professionalism, and leadership required to fight and win a major convoy battle. During the course of the war, the RCN expanded at sixteen times the rate of the RN, from an extremely small regular force to the third largest Allied navy by 1945. The bulk of the RCN consisted of reservists. The other ranks and junior officers were good material and individual ships of EG C-1 were thought during the battle "to have worked hard and with some success, though as a team they were a failure."³⁶

What the Canadian EGs lacked in general — and C-1 lacked in particular — was group training and first-class professional leadership on which to build. C-1, like some of the other Canadian EGs, required the leadership of an officer who understood the requirements of battle and could and would force situations to fit the demands of combat. Unfortunately, Windeyer was not such an officer and the mistakes of the commander of C-1 were many. For example, he failed to brief the commanders and officers of his EG and the convoy before sailing, citing as reasons bad weather and lack of a ship's boat. In addition, he failed to ensure that the officers of C-1 and ONS-154 received proper written instructions before sailing. C-1 sailed without an HF/DF officer or a functioning HF/DF set.³⁷ The lack of the latter was an especially critical mistake.³⁸ Further, Windeyer failed to inform one of the escorts that the convoy would alter course, with the result that *Battleford* was absent from the screen during the night of 28 December. Lastly, owing to an error of tactical judgement, Windeyer removed himself and HMCS *St. Laurent*, the most powerful ship in the EG, from the screen just as ONS-154 was about to be attacked. Windeyer was first commissioned in the RN in 1922 as a lieutenant, retired as a commander in 1930, and then at the beginning of World War Two entered the RCN as a lieutenant commander. Eight years as a junior officer in the peacetime RN just did not provide him with the professionalism required to command an EG in 1942 against a wolf

pack in the North Atlantic. After the Battle for ONS-154 Windeyer, who had been sent to his bed apparently suffering from nervous exhaustion, was relieved of command.³⁹

The Battle for ONS-154 was indeed a defining event for the RCN. The defeat of C-1 by the U-boats produced a crisis of considerable proportions. The Canadian mid-ocean escort groups, which for several months had borne the brunt of escort duty in the North Atlantic, were withdrawn for retraining, after which they were just as professional and battle-worthy as their British and American counterparts.⁴⁰ While defeat in the Battle for ONS-154 galvanized the RCN into retraining its EGs, the Allies as a whole were slower to learn the other lesson that convoys required air cover to prevent or beat off an attack by a large group of U-boats. There would be other defeats and several near-disasters in the North Atlantic before the lesson sunk in completely. While it would take the Allies some time to get air support for convoys in mid-Atlantic, it would not be until this materialized that the U-boats ultimately would be defeated.⁴¹

NOTES

1. Francis L. Loewenheim, Harold D. Langley and Manfred Jonas (eds.), *Roosevelt and Churchill: Their Secret Wartime Correspondence* (New York, 1975), 262.

2. The most recent surveys of the Battle of the Atlantic are Dan van der Vat, *The Atlantic Campaign: World War II's Great Struggle at Sea* (New York, 1988) and John Terraine, *The U-Boat Wars, 1916-1945* (New York, 1989).

3. Cf. Jiirgen Rohwer, *The Critical Convoy Battles of March 1943: The Battle for HMX-229/SC-122* (Annapolis, 1977); and David Syrett, *The Defeat of the U-Boats: The Battle of the Atlantic* (Columbia, SC, 1994).

4. Canada, Department of National Defence (DND), Directorate of History (DHist), "Memorandum to DTD re: Attacks on ONS-154;" Public Record Office (PRO), Admiralty (ADM) 199/356, f. 281; and Marc Milner, *North Atlantic Run: The Royal Canadian Navy and the Battle for the Convoys* (Toronto, 1985), 206-207.

5. DND, DHist, Track Charts, ON(S) 154; DND, DHist, "Memorandum to DTD;" PRO, AIR 41/47, 517.

6. United States, Naval Historical Center (NHC), "BdU War Diary," 23 December 1942.

7. The eighteen U-boats were *U-662, U-664, U-356, U-441, U-406, U-336, U-225, U-260, U-615,*

U-435, U-440, U-123, U-591, U-86, U-225, U-628, U-524 and U-455.

8. Giinter Hessler, *The U-Boat War in the Atlantic, 1939-1945* (2 vols., London, 1989), II, 69-70.

9. United States, National Archives (NA), Record Group (RG) 457, SRGN 1-49668, German Navy/U-Boat Message Translations and Summaries, 2 February 1941-9 July 1945, f. 8044; NA, SRGN, ff. 7977, 7804, 8037 and 8038; and NHC, "BdU War Diary," 26 December 1942.

10. F.H. Hinsley, *et al.*, *British Intelligence in the Second World War: Its Influence on Strategy and Operations* (4 vols., London, 1979-1990), II, 548. The best account of the breaking of the German naval codes is David Kahn, *Seizing the Enigma: The Race to Break the German U-Boat Codes, 1939-1943* (Boston, 1991). David Syrett, "Communications Intelligence and the Battle of the Atlantic, 1943-1945," *Arctovox*, XXII (April 1995), 45-59, delineates the problems with and the uses of communications intelligence in the Battle of the Atlantic as a source for both intelligence officers and historians. For a general overview of the role of intelligence in the Battle of the Atlantic, see Hinsley, *et al.*, *British Intelligence Histories* of the Battle of the Atlantic from the perspective of communications intelligence can be divided into several groups. There are those, such as the American and British official histories by S.E. Morison and S.W. Roskill, respectively, which were written

without a knowledge of Allied code breaking. This is also the case with Hessler, *The U-Boat War*, which was written for the British Ministry of Defence and is the most authoritative German account in English of the Atlantic campaign. Another group comprises studies such as van der Vat, *The Atlantic Campaign*; Terraine, *U-Boat Wars*; and Correlli Barnett, *Engage the Enemy More Closely: The Royal Navy in the Second World War* (London, 1991), which are surveys dealing only with communications intelligence in very general terms. A third category includes those books, such as Ralph Francis Bennett, *Behind the Battle: Intelligence in the War with Germany, 1939-45* (London, 1994), 168-201, which attempt to assess the general impact of communications intelligence on the Battle of the Atlantic. Indeed, there are few works which show in any depth the actual role of communications intelligence by utilizing material such as decrypts. Two Canadian studies — W.A.B. Douglas, *The Creation of A National Air Force* (Toronto, 1986) and Roger Sarty, "Ultra, Air Power, and the Second Battle of the St. Lawrence, 1944," in Timothy J. Runyan and Jan M. Copes (eds.), *To Die Gallantly: The Battle of the Atlantic* (Boulder, CO, 1994), 186-209 are among the few to show effectively how an Allied force used communications intelligence to hunt U-boats. Syrett, *Defeat of the U-boats*, shows the role of communications intelligence in defeating the U-boats in the North Atlantic convoy battles of 1943.

11. PRO, ADM 223/15, ff. 133-135; NA, SRGN, f. 7879; PRO, DEFE 3/705, intercepted 1652/25/12/42 decoded 2142/26/12/42; DEFE 3/706, intercepted 1719/25/12/42 decoded 2322/26/12/42; NHC, "BdU War Diary," 26 December 1942.

12. PRO, ADM 199/356, ff. 282 and 296; PRO, DEFE 3/706, intercepted 1930/26/12/42 decoded 1458/27/12/42; PRO, DEFE 3/706, intercepted 2356/26/12/42 decoded 0225/27/12/42.

13. PRO, DEFE 3/706, intercepted 0044/27/12/42 decoded 0145/27/12/42; Jurgen Rohwer, *Axis Submarine Successes, 1939-1945* (Annapolis, 1983), 142; PRO, ADM 199/356, ff. 282 and 373-375.

14. PRO, ADM 199/356, ff. 282-283. At the time of the sinking of *U-356* the Allies thought that "[t]here is insufficient evidence for an accurate analysis. It is considered that the U-boat was

possibly damaged." *Ibid.*, ff. 276-277. Postwar studies based on communications intelligence show that *U-356* was destroyed.

15. PRO, DEFE 3/706, intercepted 1004/27/12/42 decoded 1412/27/12/42; and PRO, ADM 199/356, f. 383.

16. *Ibid.*, f. 282.

17. Cf. Barnett, *Engage the Enemy*, 888-889. See also Thomas Wildenberg, "Chester Nimitz and the Development of Fueling at Sea," *Naval War College Review*, XLVI (Autumn 1993), 52-62.

18. PRO, ADM 199/356, f. 282; and Rohwer, *Axis Submarine Successes*, 143.

19. PRO, ADM 199/356, f. 303; NHC, "BdU War Diary," 27 December 1942; PRO, DEFE 3/706, intercepted 1426/27/12/42 decoded 0330/31/12/42; NA, SRGN, ff. 8081, 8110, 8124, 8125, 8126, 8130 and 8134.

20. For an account of the career of this vessel, see Marcel Jullian, *HMS Fidelity* (London, 1957).

21. PRO, ADM 199/356, ff. 283-284.

22. DND, DHist, ONS-154.

23. Rohwer, *Axis Submarine Successes*, 143-144.

24. PRO, ADM 199/356, f. 376.

25. NHC, "BdU War Diary," 28 December 1942; and NA, SRGN, ff. 8259, 8268 and 8315.

26. PRO, ADM 199/356, ff. 284 and 376.

27. *Ibid.*, ff. 285, 336 and 376; Rohwer, *Axis Submarine Successes*, 144; and PRO, DEFE 3/706, intercepted 2309/30/12/42 decoded 0755/31/12/42.

28. PRO, ADM 199/617, ff. 334-335; and NA, SRGN, f. 8338.

29. PRO, ADM 199/617, ff. 335-336; and ADM 199/356, f. 285.

30. NHC, "BdU War Diary," 29 December 1942; NA, SRGN, ff. 8260, 8287, 8294, 8330 and 8459;

and PRO, DEFE 3/706, intercepted 1522/30/12/42 decoded 0831/31/12/42.

31. The merchant ships sunk were *Empire Union*, *Melrose Abbey*, *Soekaboemi*, *King Edward*, *Norse King*, *Melmore Head*, *Ville de Rouen*, *Empire Wagtail*, *Baron Cochrane*, *Lyton Grange*, *Zarian*, *President Francqui*, *Empire Shackleton* and *HMS Fidelity*; the vessel damaged was *Scottish Heather*. Only *U-356* was lost on the German side. PRO, ADM 223/17, "U-boat Trend," 21 December 1942-30 December 1942.

32. Cf. Alfred Price, *Aircraft versus Submarine: The Evolution of the Anti-Submarine Aircraft 1912 to 1972* (London, 1973).

33. PRO, ADM 223/17, "U-boat Trend."

34. PRO, ADM 199/2084, ff. 513 and 533.

35. David Syrett, "The Battle for Convoy TM 1, January 1943," *American Neptune*, L (Winter 1990), 42-50.

36. Milner, *North Atlantic Run*, ix-x; and PRO, ADM 199/356, f. 278.

37. *Ibid.*, ff. 276-278 and 281.

38. Cf. Rohwer, *Critical Convoy Battles*, 198-200.

39. *The Navy List for May 1930, Corrected to 18th April 1930* (London, 1930), 64; *The Navy List for December 1940, Corrected to 18th November 1940* (London, nd), 722; and PRO, ADM 199/356, ff. 277-278 and 286.

40. Milner, *North Atlantic Run*, 210-213; and Marc Milner, *The U-boat Hunters: The Royal Canadian Navy and the Offensive against Germany's Submarines* (Toronto, 1994).

4L Cf. Rohwer, *Critical Convoy Battles*; and David Syrett and W.A.B. Douglas, "Die Wende in der Schlacht im Atlantik: Schilleburg des Gronland-Luftlochs, 1942-1943," *Marine-Rundschau*, LXXXIII (March-April and May-June 1986), 2-11, 70-73 and 147-149.