

THE HISTORICAL IMPACT OF REVEALING THE ULTRA SECRET

by

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We really should not have been greatly surprised. When Group Captain (Colonel) F. W. Winterbotham's work, *The Ultra Secret*, burst on our consciousness in 1974, it undoubtedly produced the most sweeping sensation thus far created by an historical revelation.¹ It was sweeping, especially, in the sense of seeming to demand immediate and wholesale revision of historical assumptions about virtually all that determined the course of World War II in the Atlantic sector.

It astonishes one to reflect on how little speculation there had been hitherto about the extent of codebreaking on the part of the Western Allies and how few pressures there had been on governments to answer perplexing questions. That there were stories to be gained from reluctant authorities had, of course, been noted. Historians knew something about the remarkable Enigma machines developed by the Germans. Churchill had referred to them in his monumental work on the war period, and here and there a book or an article—usually in some French or German journal—went so far as to claim that there had been successful intercepts and decipherments and that these had much to do with one or another turn of the war.² Usually such writings mixed claims of this kind with other sensational items of doubtful authenticity, so the ULTRA story was discounted with the rest. No one paid it much attention.

When David Kahn's monumental work on codebreaking appeared in 1967, he had much to add to our knowledge about the Enigma machine, but he listed no Western triumphs of interception and decipherment. He did claim that the Soviets by 1942 had cracked Enigma messages.³ To say this much was, of course, to affirm that the machine had not been invulnerable, that its secrets had been at least partially unveiled, and that it was Soviet rather than Western specialists who had achieved the near-impossible. Kahn did make one reference to the term "ULTRA" but seemed to regard it as merely another designation for the solving of the Japanese cipher system known as "Magic."

In view of the bombshell impact of

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Winterbotham's book in the following year, it is astonishing how little sensation resulted from the publication in 1973 of Gustave Bertrand's *Enigma ou la plus grande enigme de la guerre 1939-1945*. Bertrand did not leave very much for Winterbotham to spill. But the insouciance of most Britons and Americans about anything appearing in a language not their own prevented Bertrand from gaining much attention in their countries.

On the background of the breaking of Enigma, Bertrand's account is by far the more authentic, though he does not say much about ULTRA after the 1940 disaster in the West. Winterbotham supplemented this with a survey, constructed essentially from memory, of what ULTRA did for the British and Americans.

THE BREAKING OF ENIGMA

For the theme of this essay it is of little interest to dwell on the invention of the Enigma machine and how it progressed to its wartime forms. Nor does it matter very greatly here how first the Poles, then the French and British, got wind of it and worked on solutions. The Poles devised the original version of what came to be known as "the Bomb," something of a scientific miracle that in time much transcended Enigma itself. It was at first an electro-mechanical and later an electronic computer that was aimed to adjust itself to whatever alterations the Germans might make in the arrangement of the three (later five) rotors and ten pairs of plugs of the Enigma mechanism. By 1937 its Polish inventors had improved it to a point where, for a time, they read three-fourths of all Enigma messages.

What is important in this inquiry is to unravel as best we can the story on the pace and degree to which ULTRA became available to Western belligerents and exercised a growing influence on the course of the war. By a cruel quirk of fate, the Bomb on which the Poles had worked so ingeniously had small value for them. It could not cope with changes the Germans introduced into Enigma in 1938. By going dead at this critical

juncture and remaining so during the September 1939 campaign, it hardly changed Poland's fate, but its effective use might have produced a less one-sided outcome.

Luckily for the West, the temporarily immobilized Bomb and its attendant experts could be evacuated to France in roundabout ways. The Poles thereupon set up house with the French and some Spanish exiles at Vignolles, near Paris. The Poles, in fact, favored a single facility to include the British, but on this the French were adamantly negative. There was, however, an exchange of technical data and deciphered messages with the central British decrypting establishment at Bletchley Park, where the British worked by themselves until the Americans joined them after entering the war late in 1941.

The complications and problems of what in time came to be known as ULTRA were endless, and it took years to master most of them. The ULTRA designation was at first only a security classification of the British navy—not even a code name for the decrypting operation, which was then known as Special Intelligence. The army, air force, and Churchill cherished their own special terms.⁴ It was not until 1944 that the navy security designation became general and, among the initiated, came to be applied to everything that had to do with exploiting Enigma. The furor over Winterbotham's book seems to have given the term the sanction of general usage.

FIRST APPLICATIONS OF ULTRA

In the early period there were innumerable ups and downs in getting usable data to those who were coming to rely on it for insights on enemy intentions, operational moves, and strengths or weaknesses. Before anything of value could reach such high-level personages, there had to be successful progress through three stages of processing, each with its own set of obstacles and pitfalls. The first problem was one of successful interception, no simple matter when one thinks of the thousands of messages which cluttered the German air waves daily and the limited reach of signals tailored to internal use. Next came keeping

current with the Enigma settings and breaking the dozens of codes in which messages might be sent, each of which represented a separate problem. Finally, there was the question of interpretation and who should be informed. This required a highly sophisticated and insightful staff, which it was no easy task to constitute. Small wonder that in the first years there were often as many breakdowns as periods of clear sailing at each of the three stages. All too frequently a key was established too late to be of much use. For example, a setting for a message intercepted on 26 October 1939 was not solved until 17 January 1940.

The number of messages deciphered at Bletchley and Vignolles before France left the war is given variously between eight and fifteen thousand.⁵ Something like one thousand became available during the Norwegian campaign and five thousand during that in the West.⁶ In neither case does the course of events seem to have been much influenced. Winterbotham avers that it was the decipherment of a Rundstedt signal which persuaded Lord Gort to head for the coast and commence the Dunkirk evacuation.⁷ Bertrand holds that no general headquarters in history had yet been so thoroughly informed of enemy moves and intentions as the French headquarters of Generals Gamelin and Weygand, but he implies that not much was made of this.

It was thus only in the late summer of 1940 that the resources and appreciation of ULTRA reached a stage where it had a measurable influence on the course of the war. Estimating the extent of this is likely to challenge and preoccupy historians of World War II for decades to come. Just what this assessment may be will no doubt depend in good measure on the assessment of the role of intelligence generally. Just as the whole can only approximate the sum of its parts, a single ingredient cannot be greater than what it and other ingredients combine to make. Views on what intelligence achieved range from assigning it no more than a subordinate role to a verdict of "most essential contribution to Allied victory." "We owe to the arm of General Menzies that we won the war,"

avowed Churchill in presenting the general to George VI.⁸ At the other extreme of the scale of evaluation is the modest estimate of David Kahn—modest notably in coming from someone at home in the history of codes and of those who broke them. Leaning over backwards, he assesses intelligence as no more than a "secondary factor." Codebreaking, he holds, neither won nor decided the war:

I believe that even if we had had the worst intelligence and the Germans the best, we would still have defeated them. For we conquered through our manpower and industrial might, through a more efficient form of government, and through more realistic leaders. ULTRA itself became useful when we had the power to exploit it.⁹

There is no denying the significance of the fact here cited, that the period when the Bomb was finally winning over Enigma all along the line coincided with the turning of the tide in favor of the Grand Alliance. Control of the medium was bound to have more conspicuous results when the range of options in the pursuit of victory was expanding. This was only to the good. But it should not be taken—nor does Kahn mean to do so—to denigrate in any measure the contributions of ULTRA in the middle period of the war (summer 1940-summer 1943) when it did much to accelerate the turning of Churchill's "hinge of fate." With the notable exception of the 1944 landing in Normandy, it is probably only at this middle stage that ULTRA's role can be argued with any cogency to have been decisive.

ULTRA IN THE BATTLE OF BRITAIN

The middle period now to be considered featured three vital fights-to-the-finish between the Axis and its Western opponents: the Battles of Britain and of the Atlantic and the two years of intensive struggle in North Africa. In each of these showdowns the West was unquestionably victorious, and in the latter two, ULTRA's role may conceivably

have been decisive. With respect to the Battle of Britain, controversy over the proper estimate is much livelier. Though not too many may go along with Telford Taylor's verdict that in this instance the role of ULTRA was "negligible,"¹⁰ there is near unanimity in assigning the main weight to the familiar role of radar. Nor is ULTRA credited generally with being one of the four or five primary factors that are held to have spelled the difference between victory and defeat in the Battle of Britain.

The answer to this argument depends most logically on one's notion of how close to the razor's edge the outcome was poised. If, to vary the metaphor, the British are assumed to have won by the skin of their teeth, ULTRA is a plausible candidate for being among the determining factors. It often supplied information, prior to or coincident with that derived from radar, on targets and routes of approach. At times it revealed what radar could not determine until rather late in each operation—the relative weight of the raiding forces as well as which were decoys and which the real thing. There is significance, too, in Winterbotham's account of what lay behind the sacking of Air Chief Marshal Dowding, which he claims to have resulted from Dowding's inability to cite the influence of ULTRA in making his decisions. This delivered him up to his critics. If major decisions of the Chief of the Fighter Command actually resulted from revelations derived from ULTRA, it can hardly have played only a minor role.¹¹ The assessment of ULTRA's part in these events should probably remain highly tentative until the documentary evidence is at hand.

If one goes so far as to maintain that the outcome of the Battle of Britain was sufficiently uncertain to permit even a modestly assessed ULTRA to be one deciding element, it must be credited as taking here a first step toward the eventual victory of the Grand Alliance. The weight of informed opinion would probably accept the validity of some such chain of reasoning as follows:

First, if Hitler could have gained mastery in the air over the Channel and the south coasts of England by mid-September, he would

probably have invaded the island with considerable chance of success.

Second, if Britain itself had fallen, continuation of the war from Canadian territory could scarcely have either sustained the defense of the Empire in the Mediterranean or mounted an effective trans-Atlantic counteroffensive with or without American participation.

Finally, with Britain unable to exert pressure on Germany by air or by vigorous action in the Mediterranean, Hitler's attack on the Soviet Union would have had a much greater prospect of success.

That it ever came to a Battle of the Atlantic in the form it assumed and to a series of dramatic encounters in North Africa thus hinged on the issue of the struggle for the tight little island. Indeed, the overture in the fighting in the Mediterranean was, so far as ULTRA was concerned, really a final act in the fading battle over the Channel. It was ULTRA which revealed to Churchill that Hitler privately was acknowledging defeat in this contest. Thereby he was made to feel safer in dispatching reinforcements sufficient to tip the scale in the Middle East against the Italians. And it was in North Africa that ULTRA first came into something like its own to mitigate disaster and lead in the end to glittering triumph.

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THE NORTH AFRICAN STORY

Things did not commence in this fashion. Indeed, the way Rommel began his role in Africa submitted British faith in ULTRA to a momentary shock. No one expected the man who emerged as the "desert fox" to ignore concrete orders to wait until May before making any offensive move—orders known to General Wavell through ULTRA. So when Rommel struck in March, the surprise achieved handed him his first victory. Thus, the British had their first lesson of what they might expect from this headstrong general and learned that, in dealing with him, they could not always be sure that ULTRA supplied all the answers. At the time they had to wonder whether the Germans had gotten on to ULTRA and were using it for deceptions of their own.

Certainly no leader of World War II had more reason to complain about the tricks played him by fate in the guise of ULTRA than Erwin Rommel. No other commander over so prolonged a period was affected so outrageously by the ability of his opponents to look into his cards. His troubles were compounded by his isolation and need to communicate at length on situations about which it was not easy to gain understanding in Berlin. He was under pressure to employ exceptional frankness, to lay clear his chief anxieties and vulnerabilities, to describe his needs in detail and with eloquence. All of this was revealed to his opponents by ULTRA. The list of occasions on which his triumphs were diminished and his disasters made worse is a staggering one. The climax battle at Medinine in Tunisia offers a graphic example. The message detailing what he intended to do there on the day of encounter reached Montgomery the evening before at approximately the same time that it was received by Rommel's official superior, Kesselring, in Italy.

Equally as serious as such specific blows of fortune was the systematic strangulation of his services of supply. It mattered little, for example, whether his tankers sailed from Naples, Taranto, or Piraeus. In most instances the British knew their schedules and the routes they were to follow.

The sum of ULTRA's influence on the war in North Africa permits the query whether it was not the decisive ingredient of British and later Anglo-American victory in the Mediterranean. Without it, the time and extent of that triumph would at any rate have been inconceivable. From this success followed the outcome, or at least the inauguration, of the Allied landing in the Maghreb, the invasions of Sicily and Italy, the fall of Mussolini, and much else that counts among the nails in Hitler's coffin.

THE BATTLE OF THE ATLANTIC

The Battle of the Atlantic lacks most of the elements of high-level human drama which are to be found in the contest between Rommel and such colorful opponents as Wavell, Auchinleck, and Montgomery. However, it covered a wider span of the earth's surface, involved a greater mobilization of national energies, and was more fateful in its consequences. It also presents a wider range of problems that better illustrates both the advantages and inadequacies of ULTRA intelligence than do the simpler, in-and-out slugging matches in North Africa.

A close look at the contest in the Atlantic quickly reminds one of a point that is often overlooked in placing ULTRA within the general war picture. Juergen Rohwer has called attention to how often the Enigma-ULTRA problem is treated as the simple success story of one branch of Allied radio intelligence.¹² A clearer perspective is achieved if one reminds oneself that all branches of radio intelligence taken together could not assure full knowledge of German intentions. "The Allies," avers Rohwer, "did not know everything but only something and this was not all the time but part of the time."

Further, it should be held in mind that in World War II the Atlantic competition in the field of radio intelligence came very close to being one between equals. At least this may be said of the conflict until the spring of 1943 when, after the Allies or the Germans several times were "one up" on the other, the former emerged as definite victors. Both sides suffered costly failures and scored notable

successes. Each had to face exceptional difficulties well beyond those encountered by the cryptanalysts of the armies and air forces. Thus, the German navy's version of Enigma proved a much harder nut to crack than those of the other German armed forces or government agencies. The early wartime version of *Funkschlüssel M*, a designation literally meaning "radio key," had first been adopted in 1934. Like other forms of Enigma, it then used only three rotors at a time, but these were selected from a group of eight rather than the customary five. The five-rotor version already permitted six sextillion (6,000,000,000,000,000,000) variations. "Astronomical" does scant justice to the additional multiples possible with a choice of eight rotors for the navy machine. Topping this further, it was later adapted to the use of four rotors simultaneously!

Small wonder that ULTRA had slim pickings in the intensifying sea warfare of the first year after the French surrender. Without traffic analysis and the cathode-ray direction finder (Huff-Duff), British radio intelligence at this stage would have cut a sorry figure in matters naval. In fact, even in later days when ULTRA rode high, these continued to bear a share of the burden that is obscured by the near monopoly ULTRA has now gained of the limelight.

Not until the spring of 1941 did this aspect change, and, when it did, it was with the suddenness and almost the quick passing of a thunderclap. On 8 May the German weather ship *Muenchen* was captured, followed two days later by the loss of the submarine *U-110*. Both yielded code books, wireless logs, and sheets of soluble paper that carried the schedule of daily machine settings. To cap it all, the *U-110* yielded an undamaged Enigma.¹³ By early June these treasures were sufficiently digested at Bletchley Park to permit the British for two months blissfully to read the entire wireless traffic between the German navy and its ships at sea. A few weeks sufficed to annihilate the German surface supply organization and, in terms of experience hitherto, embark on a field day in submarine hunting.¹⁴ Only one of some fifty

Allied North Atlantic convoys was attacked during this period, the others being rerouted when intercepted signals spelled danger.¹⁵

Whatever comfort this offered was balanced by the frantic race against time—the awful August deadline when the captured schedules of Enigma settings would run out. It would then be necessary to fall back on a Bomb which, however miraculous an invention, still had far to go to be effective against the German naval Enigma. To cut down on the time-lag between interception and utilization of signals, the British technicians and cryptanalysts worked like men possessed. The Germans had felt safe in assuming that it would take years for an enemy to establish even a single setting. By heroic efforts in improving the original Polish Bomb, the British had cut this down to a matter of days. If, whirling through all conceivable combinations, the solution to a setting could be found in a day or two after receipt, all might be well. If it did not turn up for a week or more, it was probably useless. Thus, there were bound to be great fluctuations in utility. Tracing messages from interception to when they found a haven in the hands of the clients of the cryptanalysts is no easy task for the historian. Certainly this portion of his road is beset by challenges and no few traps and pitfalls.

The German navy, which could boast of its own cryptanalytical smiles of fortune, encountered very similar problems. One illustration, provided by Rohwer, is particularly forcible. In the first 20 days of March 1943, 35 Allied convoys threaded their way across the North Atlantic. They sent or received 175 wireless messages that were intercepted and decrypted by the Germans. Only ten of these were processed on time to be of operational value!¹⁶

For the Allies, 1942 was a year of frequent teetering on the brink of disaster in the Atlantic sea lanes. With the German declaration of war on the United States after Pearl Harbor, American ships became fair game for the hitherto frustrated U-boats. Conditions off the Atlantic coast, plus Washington's refusal to adopt the convoy system, made for extraordinary vulnerability.

Perhaps yet more serious was the lack of an American naval intelligence unit equivalent to Britain's Operational Intelligence Centre (OIC) dealing with radio intelligence. Therefore, although OIC warned early of having learned via ULTRA of *Paukensschlag*, the approaching submarine campaign in the western North Atlantic, there was not too much for Washington to do about it. The establishment of an opposite number to OIC, known as Op-20-G, was an important step to remedy this.

In view of the stepped-up submarine activity in the western North Atlantic, which in radio communications paralleled the expanded hunting range, the Germans made changes in their system of signals which unwittingly paralyzed the Anglo-American decrypters. At the end of January 1942, a new code book and an additional cipher circle (Triton) were introduced for submarines at sea. The result was a complete blackout just when affairs were approaching their most critical period, which endured from February into December. Luckily the continued employment of the former main code (Hydra) to signal U-boat departures and returns did give some insight on the general pattern of operations.

It was now the turn of the submarines to have their innings. For example, in May and June 1942, one small group of six U-boats intercepted five of six westbound convoys.¹⁷

The promise of relief came in December, when Bletchley finally solved the new cipher circle. It remains to be authenticated whether this was the result of a fortunate new capture. This probability would fit in with the fact that the flow of decrypted messages came back like a gusher one evening and continued at flood-level all night.¹⁸

One fantastically fortunate boon of the conclusion of the ULTRA navy blackout of 1942—which together with other aspects of the resumed ULTRA flow decided the wireless battle of the seas and with it, perhaps, the Battle of the Atlantic—was the end of the long and impressive German record of decrypting British naval messages. With the obstinacy so characteristic of pride which

rebels at the thought of one's code having been broken, the British navy, year after year, had ignored mounting signs that this was the case with its ciphers. Before the war, proposals of Lord Mountbatten for the introduction of cipher machines had received no hearing. Actually, the Italians had broken the British naval code during the Abyssinian War and in 1939 had passed on the information to the Germans. There is also the probability that the Germans had already accomplished this on their own.

Britain was well along with her fourth year in the war when an incredible foolhardiness on the part of the German submarine command itself blew away any last illusions about the inviolability of British naval ciphers. A signal to U-boats actually revealed that information being transmitted was derived from decrypted British dispatches. Though there was an inevitable hiatus before ciphers could be replaced and new code books issued to the field, the curtain came down for once and all on this previously profitable field of German radio intelligence.

Nearly coincident with this gift from ULTRA was a feat of British cryptography which capped any other of the Second World War. In March of 1943, ULTRA yielded a German code word recognized as signifying a shift to an additional (fourth) rotor within the Enigma machine itself. The blood of the men at Bletchley ran cold. Unless this move could be countered in short order, there was the grim prospect of another extended blackout on decipherment—sheer disaster at that critical juncture. Bletchley concentrated its every resource and, unbelievably, in ten days found a solution to the problem. Together with the Huff-Duff (radio direction finder), substantial improvements in the use of escort carriers and convoy escort groups, and long-range aircraft featuring the new centimetric radar, this meant the end of major U-boat threats in the Atlantic. After "Black May" of 1943, Doenitz perceived no choice but to abandon the offensive.

This does not signify that there were no occasional further hitches in the exploitation of ULTRA by the Royal and American navies. With Enigma settings still having to be

broken anew every day, there was never time to relax and become complacent. OIC and Op-20-G had to keep working at full speed to keep on top of the flow. Decryptings from time to time still might be delayed for four or five days, with the possibility of the Germans changing orders during the interval. Once, in July 1943, there actually was a hiatus of three weeks. However, by the end of that year a delay of more than 24 hours was becoming rare, and there were no further periods of intolerable pressure such as had been endured periodically during the earlier war years.

In reviewing the broad panorama of the Atlantic contest, and taking judicious note of monthly and seasonal fluctuations, the conclusion appears inescapable that the ups and downs in the curve of the conflict at sea coincided closely with those in the area of radio intelligence. This is also true of the effectiveness of ULTRA in particular. It remains for history to determine whether or not the latter deserves credit as having played the most decisive role, but it appears at least plausible that this will be the ultimate verdict.

THE NORMANDY LANDING

An assessment of similar import needs to be reached on the part played by ULTRA in that enterprise of the Anglo-Americans which comes closest to a valid claim of determining the outcome of the war: the landing in Normandy. It is one of the stories about ULTRA that has been retold most often during recent years. There is much that offers high drama in the tale of how the Allies listened in on high-level German debates on where the landing should be expected; how the Allies, through a rich variety of devices, nurtured those illusions which were most serviceable to them; and how, in the end, they achieved complete tactical surprise. Only so much of a review of events need be alluded to here.

"We are putting the whole works on one number," General Eisenhower wrote a friend shortly before D-Day. This was not mere rhetoric. There is much that supports the view that the invasion of June 1944 was truly a one-shot proposition, which, had it failed, was

not likely to be attempted a second time. That is not to say that the Anglo-Americans would necessarily have been physically incapable of another effort. It was more a problem of morale—of whether the national will of the two peoples would have been equal to the strain of trying it again, notably with such trials as the V-1 and V-2 bombs, new and far-deadlier submarines, and the Messerschmidt 262 in the offing.

There is a similar issue with respect to the impact on the Soviets if the invasion had failed. Stalin was still studying to keep his options open. In 1943 he had (apparently twice) made overtures to Hitler concerning an understanding. Far from committing himself utterly to unconditional surrender, he had addressed a series of appeals and assurances to the German people and was promoting anti-Nazi organizations among his prisoners. Not until the breakout from Normandy had swept the Germans out of France did Stalin adhere publicly to the unconditional surrender formula. If the Allies had broken their teeth on the rugged Norman coast and the prospects for a true second front had gone glimmering, it might well have depended more on the German than the Soviet dictator whether they would have reached an accommodation. Thus, there is much to argue that Eisenhower's verdict on the decisiveness of this single cast of the dice was in no way an exaggeration.

Did ULTRA spell the difference in Normandy? Again we face an unanswerable but persistent query, and perhaps there never was one on ULTRA's role that can be replied to affirmatively with so much plausibility. There can be no argument about its exercising an enormous influence, not only in preparing the ground for the landing but in all that followed—right down to the Battle of the Bulge, when its silence spoke volumes. Its role in facilitating the landing and operations in southern France is, if anything, even more positive.

MARGINS OF VICTORY

This cursory survey of ULTRA's part in what was, in so many ways, the decisive

middle period of the war has, as it proceeded, touched on much that illustrates the complexities of estimating its impact on one or another aspect of the conflict. This phase witnessed many examples of limitations on the Bomb's performance before it was perfected to its ultimate effectiveness. The most persevering questions concern major war situations where it can plausibly be argued to have supplied the margin for victory. Yet there is much to remind us that *all* significant contributions to an historical situation can similarly compose such a margin.

The concept of a margin, though not exactly inferring the weight merely of a "last straw," does imply that the sum of other contributory factors does not fall far short of providing what is needed to achieve results. Many will feel that to put things this way is to be stingy with the credit deserved by the medium. Much, again, in determining ULTRA's fair share of honor depends on the significance one is prepared to grant to intelligence generally. By itself it is nothing. If a fundamental power relationship between belligerents is unequal, the best intelligence fades into insignificance for the weaker party.

OVER-RELIANCE ON ULTRA

It will be recalled that David Kahn considered the balance in the capacity to wage war to incline so greatly toward the Allies that it approximated such an unequal condition. There will be much controversy over so emphatic a dictum, but the history of World War II is replete with examples about which there can be little debate. It has been noted that Polish ULTRA was blocked for close to a year before, as well as during, the September 1939 campaign; few would maintain that this made much difference. All essentials of the German order of battle during the campaign in Norway were revealed by ULTRA to the Anglo-French, but it was of scant help to them. Another illustration is on a grander scale: after some critical moments, the Western Allies won the Battle of the Bulge hands down without preliminary warnings from ULTRA, which was blacked out by Hitler's decision for radio silence. Other

intelligence was rendered fruitless because over-reliance on ULTRA led to ignoring other quite adequate indicators of what was planned.

Such overconfidence in ULTRA, once it had won the trust of its clients, illustrates a danger common to all branches of intelligence. When one or more sources have attained such preeminence as this, there is an inevitable inclination to pay less attention to the others. A notably apt example of this is what befell the *B-Dienst*, the German Navy's cryptanalytical service, when the previously mentioned negligence of the submarine command deprived it almost overnight of the exploitation of British ciphers. After years of heavy reliance on this single source for critical information, a certain neglect of alternative means was perhaps unavoidable. This now murderously avenged itself in the slaughter of the U-boats in May 1943. Possibly the example was not lost on British naval intelligence, which seems to have been freer than its fellow services from the temptation of relying too heavily on ULTRA. This caution, no doubt, was the more easily observed in view of the fact that OIC was also the clearing house for other types of intercepted wireless transmissions, photographic reconnaissance reports, sight and action reports of ships and aircraft, and reports from agents on shore.¹⁹

From time to time, ULTRA itself stressed the lesson that it had no infallible answers to what an opponent was doing. Even a day or two of delay, at times a few hours, might suffice for him to change his mind and dispositions. It has been noted that such a self-reliant spirit as Erwin Rommel might fail to follow orders ULTRA had recorded, or follow them in so oblique a fashion that they would be hard to recognize in execution. Such experiences showed the advisability of developing and sticking to a routine of constantly checking ULTRA against other sources of information. The reverse, of course, was even more true. There is no historic precedent for so dependable a way to determine both the specific and general reliability of sources of information.

This is not to portray ULTRA as

failsafe—nothing controlled by humans can ever deserve that accolade. As the unlocker of the incredible Enigma, it was itself the proof of this. Its own messages were transmitted in a onetime pad cipher which no one could hope to crack. Yet, the supreme lesson to be derived from the total Enigma-ULTRA complex is that no communication among men should be accounted secure. One should conclude, at least in theory, that any code can be broken, and that it is never wise to cease checking a fancied inviolability.

SOME USES OF ULTRA

Compared to other forms of intelligence, ULTRA could, of course, claim to be unique in coming closest to being foolproof until the moment when it could be shown to be otherwise. If the Germans ever caught on, they could hardly abandon Enigma or make sufficient adjustments to rectify its vulnerability without revealing this in short order. Until this became evident, ULTRA could be counted the sole source of intelligence that had never been compromised by bluffs, feints, and deceptions on the part of the enemy. It spoke "from the horse's mouth," and there was no need to fear that the animal might be of the Trojan variety.

Thus, ULTRA could claim to be an all-but-infallible guide and censor for other forms of intelligence. Using it as a control, these could constantly be tested and sanitized. What were revealed by it to be the more perceptive reports and better educated guesses could be undergirded in a variety of ways, without revealing the ULTRA source of knowledge, so as to win acceptance for their authenticity. Enemy attempts at deception were similarly uncovered. Thus, both the various categories of intelligence activities and their operatives could be checked and evaluated in a fashion that utterly transcended any previous test known to history.

One extremely valuable field of ULTRA activity which remains largely shrouded concerned absorption of information derived by the Germans from agents in countries other than Britain and the United States.

Such operators could be spotted, and then measures could be taken to thwart them, feed them misleading data, win them over, or perhaps, if all else failed, "remove" them. Or, one might decide to do little or nothing and simply permit the Germans to serve one's own purposes. Even during these last years of startling revelations not much has been exposed beyond the bare outline of this, but volumes will, no doubt, be written once Secret Service files are opened.

A related area about which much more has become known, though hitherto without revealing the ULTRA connection, is the early cracking of the German espionage network in Britain and the establishment of what was called the Double Cross system.²⁰ The extent to which ULTRA was a factor in the original breaking of the ground for this is unclear, but there is no uncertainty about its vital share in the effective exploitation of this windfall. There is no parallel known to history where the entire spy ring of one belligerent was so sweepingly turned against its architects.

Another aspect of ULTRA that has hitherto failed to secure adequate appraisal is the extent to which it alone could cover the whole range of the enemy's war effort and furnish its clients with an integrated picture. Diplomatic, economic, and propagandistic measures calculated to support military aims could be traced and countered, each in its own area as well as in the overall pattern. In the military sphere, ULTRA could show particular utility in covering combined operations. What could be learned from army signals, for example, could be checked in the communications of the other service branches. Or, what was passed over in silence in the communications of one branch, as when the decrypting of the transmissions of the German navy was blacked out, might be found in those of the other branches.

THE CONTRIBUTION TO OPERATIONAL INTELLIGENCE

The field of operational intelligence does indeed make up the bulk of the day-to-day exploitations of ULTRA. What previously frequently had to be patched together from

scraps of information of uncertain reliability was replaced by a flood of authentic detail—so much at times as to create its own complications. On many occasions, a composite picture could be drawn with some confidence in its reliability. What the Germans knew and did not know; what they understood or misperceived about Allied situations; the muscular or vulnerable points in their position as they conceived them; whether one's own deceptions were catching hold—these and related things were laid bare, in the end virtually daily. Thus, the ways in which ULTRA was a fruitful aid in tactical matters approach infinity.

The issue of this may be summed up tellingly in a single statement: with one major exception in the landing at Salerno, the Allies won tactical surprise in *all* of their more important offensive operations. The weight of this finding is the more imposing if one contrasts it with the record of World War I, which shows no more than one case of which this unqualifiedly may be said, the French attack at Villers Coteret in July 1918. This fact is the more noteworthy if one recalls that the French attack developed from an intelligence coup which had helped materially to thwart the last gasp of the German 1918 offensive a few days earlier.²¹

ULTRA AS AN AID TO STRATEGY

Though there can be little argument about the tactical utility of ULTRA, there is much room for debate in attempting to measure its strategic import. By the time it had been perfected, the Allies had so gained the initiative in the war that the range of German strategic options had narrowed. The running story which ULTRA had to tell therefore concerned mostly actual or potential German responses to Allied offensive moves, the one exception being the silence of ULTRA on what Hitler was preparing for the Ardennes. To date no plausible argument has been advanced that there were any immediate links between ULTRA and Allied strategic intentions, whereas the opposite has been maintained with much vigor. Telford Taylor,

for instance, is convinced that ULTRA had no recognizable influence on strategic designs or decisionmaking.²²

One can easily fall in line with this if the question is limited to ways in which specific ULTRA items would be claimed to inspire one or another Allied resolve in the strategic field. But the problem can also be regarded from several other angles. Thus, if one endorses a high estimate of what ULTRA accomplished in the middle period of the war, perhaps turning the tide in one or another of the more vital areas previously discussed, then there is room for the view that ULTRA provided the elbowroom for offensive strategy through its role in these showdown encounters. How much leeway would there have been for offensive decisions if there had not been these checkmates for German initiatives? The outcome of the Battle of the Atlantic, for example, could logically be claimed to have set up the Germans for the body blow of the invasion.

Beyond this, it can be advanced that even though no specific intercepts can be shown to have materially affected one or another Allied strategic resolve, ULTRA portrayed a state of affairs which led to the Allied conviction that the necessary favoring odds did prevail. History may also record that reliance on what ULTRA had faithfully delivered for years assured Allied strategists that they could count on this resource to continue to aid them at every turn of their operations.

FIRST REACTIONS TO ULTRA VARIATIONS

The historian of World War II thus appears fated to be occupied for decades by the complex of problems with which the revelations on ULTRA both serve and afflict him in the pursuit of his craft. He quails before the thought that over the years he has labored at puzzles from which vital pieces all too often were withheld. Though he is accustomed and somewhat reconciled to working as best he can with what is at hand or what he can dig out, he previously thought that he had some idea of what was missing. He could still feel confident that some kind of

meaningful picture was attainable. The ULTRA revelations, however, have brought home to him that the picture he thought accurate, at least in outline, was often a distorted one. Frequently he had actually relied on the cover story concocted by the purveyors of ULTRA to mislead the Germans and, up to a point, their own uninitiated colleagues. Knowing little or nothing of the missing pieces, he had been unable to make allowances for them. Most short-changed and second-guessed were the official historians, some of whom may feel a little ridiculous for having been forced to work without these pieces of the puzzle. It can only aggrieve them that, like their academic colleagues, they are being outdistanced by the free-lancers, who are less disciplined by the compulsions and delays expected of scholarly reserve.

It was in the order of things that the first among those associated with the British side of ULTRA to break silence should be among the less circumspect or inhibited in dealing with facts. There is a certain irony, also, in the circumstance that the man charged with ULTRA security should himself lead the pack in revealing it and do so with much *éclat*. Group Captain Winterbotham was charged with administrative arrangements for the distribution of ULTRA, though his book does not give the impression that his role was thus circumscribed. Yet his position was one of considerable responsibility, making him, among other things, a channel to the Prime Minister. This meant that ULTRA communications most likely to convey a broad overview of the influence exercised by the medium passed through his hands. Yet Winterbotham had to write from memory, suffered from some of the garrulousness at times associated with old age, and had an acute sense of his own importance. At times he seems to have allowed his fancy to roam, failed to check on matters of fact and association where it would not have been too difficult to do so, and further enhanced the high drama by exaggeration.

The failings of Winterbotham's book undoubtedly are doing more to drive other figures associated with ULTRA out of the woodwork than a more restrained account

could have done. There is no more effective device for compelling reluctant people to write or talk than to compose something they regard as iniquitous or false that is then welcomed with popular acclaim. This response of men-in-the-know was the more salutary as the first effect of the publication had been to catch the historical profession somewhat off balance. With little or no previous awareness of ULTRA, there was no body of knowledge concerning its working to which it could be related. The high quality of and general respect paid Sir John Masterman's work on the Double Cross system also helped Winterbotham to secure wider credence for an account of related matters scarcely more sensational by an obvious insider of some standing. For a time there was a widespread tendency to accept too much of Winterbotham without waiting for corroboration of what he had revealed.

The need for a better perspective was so evident to old ULTRA hands that some otherwise wary figures among them were shaken out of their reticence. The result so far has been to draw from some of them a more reliable story of what went on behind the ULTRA facade. Among those to comment incisively is Sir David Hunt, himself deeply involved in the operation. After citing chapter and verse on numerous failings in Winterbotham's account of military affairs, he concludes with the severe verdict:

It is the evidence of such simple examples of a fundamental incomprehension of the nature of military operations, rather than factual errors of detail, that convinces me that Mr. Winterbotham's book will never be used as a primary source by serious historians.²³

This judgment may yet be felt overly severe. Historians owe something to Winterbotham for being the first to open floodgates that can never again be shut completely and, in time, are likely to be swept away entirely. He has also furnished us points of departure for a review of the many wartime problems in which ULTRA seems to have been significantly involved. The cautions

concerning him expressed by Hunt and others should apply equally to all claims about ULTRA made to date or fated to appear in the years ahead.

Speaking of unlocking floodgates, though Winterbotham must be credited with the first public move in Britain, he can only have anticipated by a little bit what, looking back over the last years, appears an irresistible trend. Too many aspirant writers, such as Anthony Cave Brown, were becoming aware of the ULTRA secret, and Winterbotham was far from alone among the initiated in beginning to speak freely with them. Cave Brown, in fact, was on the point of publication when Winterbotham, it is said, broke an agreement with him to let his book appear first.²⁴ William Stevenson's *A Man Called Intrepid: The Secret War* was also well along to completion and was certainly not going to be delayed for Winterbotham or anyone else.²⁵ Despite the ill attention customarily given by the English-speaking world to what is published on the Continent, Gustave Bertrand's revelations were beginning to filter through professional channels. The mid-1970's thus appeared to beckon to all who were off the mark and running, each of them trying to be the first to lay bare the great mystery.

Although Cave Brown's work was the fruit of many years of research and writing, it was conceived on so vast a compass that critics felt it still too hastily thrown together. As the first intensive study to weave ULTRA into the broader war picture, it served to demonstrate the extent to which, rightly or wrongly, it would be claimed to have intervened dramatically in the course of affairs. Cave Brown has been reproached in reviews for handling both primary and secondary sources with inadequate discrimination, for cluttering the book with material of doubtful relevance, and for riddling it with errors of fact. Be that as it may, much remains that is substantial as a history, in the main, of British World War II intelligence. He also gives us numerous points of departure in relating ULTRA to the chain of events. The book appears likely to stand up

for a number of years unless someone known only to few should be well along with a work of similar immense coverage. There is some parallel here to William Shirer's *The Rise and Fall of the Third Reich*, which still commands some undeserved audience, if only because no one else has covered the topic on quite this scale.

Stevenson's *Intrepid* relates the story of British intelligence in the Western Hemisphere, which previously had been much neglected. He is censured for having felt the safer in allowing his imagination considerable play whenever there was an opportunity to build up his hero and near-namesake, Sir William Stephenson. In the course of this buildup, Sir William is made to emerge as virtual director of British worldwide intelligence and receives an enthusiastic accolade as supposed discoverer of ULTRA. It may be assumed that in the years ahead there will be others who, for themselves or for those about whom they write, will make similar extravagant claims where ULTRA is concerned. It should prove a prestigious umbrella under which to shelter wartime reputations.

As with that of Winterbotham, such works as those of Cave Brown and Stevenson were fated by their very slips to needle survivors of the Bletchley operation to respond with their sense of "the facts." Future memoirs of still surviving World War II figures who counted among the architects or recipients of ULTRA should reflect this stamp. Those who have disciplined themselves to discretion in works already published may well respond to the refrain of "Now it can be told" with supplements, revisions, or at least "Letters to *The Times*."

ULTRA SECRECY

With so much already or about to be revealed, there is no longer much purpose in holding back nontechnical data bearing on ULTRA. Some will always lament that the seal ever was broken and predict that the lepidoptera emerging from what they conceive to be a Pandora's box will yet do mischief. ULTRA, they feel, should have

remained history's best-kept secret, one the more remarkable in that it was shared in some manner by more than ten thousand associated with Bletchley Park. Others continue to express wonder that it was ever deemed imperative to maintain such restrictions after the war ended. The most commonly offered explanation is found in Western concerns regarding the Soviet Union.

During the conflict itself, there had been severe heartburnings when the British, perceiving that no other course was really open to them, had reconciled themselves to taking the Americans into their confidence. Only Churchill is said to have given some brief thought to doing the same for the Soviet Union.²⁶ Looking back, such a step now appears, if anything, even less conceivable than it did at the time.

For some months after Hitler's attack, there was small confidence in the West that the Soviets would stem the Nazi tide. By the time it became evident that there was a genuine prospect of their doing so, it had already been demonstrated that Soviet cipher security was in a wretched state. Frequently the British learned far more from what ULTRA related in German intercepts of Soviet dispatches than they were able to wheedle out of Moscow. To have signalled this to the Soviets would not merely have exposed ULTRA to them, but most probably to the Germans as well. It goes without saying that the Kremlin would never have submitted to anything like a Western review of its security procedures. A further serious hazard was the fluid state of the Eastern Front, where command posts were sometimes overrun and army commanders and their entire staffs captured. There were also the thousands of German agents and sympathizers behind Russian lines. The risks were simply too great! Accepting them would have seriously compromised the second front so ardently desired by Moscow.²⁷

As things were, within the limits of the cautions ULTRA imposed upon them, the British did convey to Moscow information derived from this source. Churchill advised Stalin of the approaching German attack and, during the more critical stages of the war in

1942, much information on German troop strengths and moves was relayed from London. Stalin rudely repulsed Churchill's warning and seems to have paid little heed to later intimations on what the Germans were up to militarily.²⁸

Upon conclusion of the war, one factor in maintaining ULTRA secrecy was anxiety that the Axis countries would see therein a convenient alibi for their defeat. There was also fear of charges, both in the Western countries and from Moscow, that withholding it meant lukewarmness—if not disloyalty—in dealing with our eastern allies. The validity of this apprehension, insofar as the possible reaction in the United States is concerned, is demonstrated by voices raised even at this late date when ULTRA's historic role was revealed. In the years immediately after 1945, when allies of yesteryear emerged as the rivals of today and potential enemies of tomorrow, it was also deemed imperative to hold back technical secrets which had continuing importance. At the very least, even basic knowledge of ULTRA's compass would put the Soviets on their mettle in perfecting their cipher systems and their own electronic surveillance.

THE HISTORIAN AND THE DOCUMENTARY RECORD

Now that the wraps are off on the secret itself, governments will labor under heavy pressure to abandon restrictions that have lost meaning. Nontechnical experts can scarcely judge the importance of retaining whatever has to do with codes, cipher machines, and instruments—such as the Bomb—to read them. But there are no perceivable reasons for holding back on data covering ULTRA's impact on affairs. Nor has there to date been overly much argument from official quarters against this point of view. On the whole, official response to appeals to make ULTRA documentation accessible as soon as possible has been encouraging. Just what remains for conceivable release is not yet clear. It appears to be practically common knowledge among surviving ULTRA operatives that a good deal was destroyed in 1945 or 1946. But there

seems to have been no public statement on just what is entailed, whether the files eliminated were routine matter or documents of such extraordinary confidentiality that it seemed foolhardy to permit them even to exist.

Among the first to be released are early postwar reviews of the work of intelligence services. The late Sir John Masterman's book on the Double Cross system was the first of these to be published. On the American side, the first material of this type was released in July 1977. It is a volume of the Op-20-G Final Report Series dealing with ULTRA's part in the convoy struggle with the U-boats from December 1942 to the end of the war. A miscellany of British (OIC) documents—notably the weekly reports to the First Sea Lord, beginning in December 1941, and summary reports of the Submarine Tracking Room after major convoy battles—may now be seen at London's Public Record Office. Cambridge Professor F. H. Hinsley is well along with a four-volume official history of British World War II naval intelligence services containing important sections on ULTRA. Though no decision on its publication is said to have been reached, it is difficult to imagine that after the manuscript has been completed the British government will resist the united cry of scholars, journalists, and free-lancers for publication.

Assuredly, we may count on a steeply rising demand for access also to the raw material from which such summary reports are prepared and, hopefully, on a steady attrition of the remaining resistance in official quarters to declassification. Releases of archival deposits will confront the historian with as many problems as they may solve. Historians will do well to arm themselves for the complexities they must expect to encounter.

The ULTRA production process involved an intricate chain of steps: interception, decipherment, translation, discussion and annotation by service advisers, choice of recipients, transmission, and consideration by ultimate clients. Messages likely to be of concern to top-level decisionmakers would go

to the heads of government and other designated top officials. The service ministries were more voracious clients, receiving whatever seemed likely to be of interest to them. A more discriminately skimmed-off portion would go to commanders in the field, who, together with their G-2's and other designated parties, were informed just before or after the customary intelligence briefing by the officer acting as ULTRA representative, whose official designation might differ from post to post. Though he will have other, usually more important, things to do, the historian glorying in detailed study should feel thoroughly at home going back all the way to the deciphered intercepts, to check translations and determine the wisdom of choices on what went up the line.

A most vital source for the student of ULTRA will be, if it has been preserved, the comprehensive index that was the most essential contemporary aid to the service advisers. It was their principal refuge in forming their judgments on the relevance of messages and to whom they should be distributed. A message that at first glance appeared garbled or which initially could not be fitted into the current scene might become clear when correlated with one coming through months earlier. So essential did the index become to operations that, every so often, the up-to-date cards were photographed and buried under the Bodleian Library at Oxford, just in case the originals should be destroyed in an air raid.²⁹

Evidence available to date indicates that intensive study of the documentary record will reveal in crystal clarity the centrality of the time element in determining the place of ULTRA in a particular process of decisionmaking. Thus far there has been too little data at hand to trace with certainty the movements of an intercepted and deciphered message up the chain of translation, analysis, annotation, and transmission to its recipients, culminating in the calculations that moved the latter to decisions. This has fostered false assumptions that ULTRA had a part in virtually every piece of decisionmaking on the part of Allied commanders during the last two

or three years of the war. When the documents are at hand, most of the guesswork and easy generalization from known instances should be eliminated.

The intensive documentary study of ULTRA should provide answers to an infinity of questions that have thus far eluded us. It should not be expected to clear away every myth and mystery of World War II in its Atlantic sector, but it should serve to sweep the fog from many of them. In first line, it should quickly eliminate myths derived from the revelations on its existence and the excessive enthusiasms they engendered.

Problems in estimating ULTRA's role will be with us for decades. There has been reference to its being used in operational situations only when some form of cover was available—a plausible explanation stressing another intelligence factor that would quiet doubts both of one's own uninitiated and of the enemy. Most often, of course, such other factors were themselves genuine contributions to the intelligence analysis. In retrospect, it thus becomes exceedingly difficult to measure their influence against that of ULTRA in making a decision. This is compounded by the total absence of ULTRA records in the files of armies and army groups. Reports by Special Liaison Units (SLU's) to ULTRA representatives or ultimate recipients were submitted in a single copy, which had to be returned and destroyed. Consequently, commanders and ULTRA representatives must perforce speak from memory, and their testimony today, however indispensable, can be no adequate substitute for documentary records. To differentiate between pure cover and contributory factor, and to measure the weight of the latter against ULTRA, will prove no simple tasks, and at times the results are bound to land beside the mark.

Declassification and release of archival material on ULTRA is almost certain to be gradual and somewhat sporadic. This will challenge the historian to constant reassessment of ULTRA's role, both generally and in specific phases and situations of World War II. Estimates will vary and probably undergo fluctuations. In the process, the reputations of military leaders will be enhanced or diminished. Broadly speaking,

the historical appraisal of German commanders should move upward with each ascent of the curve, and that of their Allied rivals should decline in proportion. The reverse will be true whenever the role of ULTRA appears less impressive. Allied commanders will also be ranked according to the measure in which they appear to have used ULTRA effectively. No one foresaw this with more jealousy than Bernard Montgomery, who resented having to share—even with Churchill—knowledge of the support ULTRA afforded him.

THE FUTURE OF ULTRA STUDIES

As we move along, the "what" of history will obviously be less changed by ULTRA discoveries than the "why." Causation has always presented the historian with the hardest nuts to be cracked and has drawn from him his most insightful reflections. No matter how modest an eventual consensus on ULTRA's role may be, no one is likely to judge it so low as to expect from it only "footnotes to history." Old chapters must be rewritten and new ones added, mines once thought worked out must be reopened, and the "ifs" of history should grow mightily in number and portent. There should be room for application of new methodologies. In a period when electronic surveillance is advancing at so rapid (and frightening) a pace, quantification analysis may prove a rewarding approach.

The interest spurred by ULTRA revelations, both within the historical and military professions and among laymen generally, should be further utilized for such discussions as those held at the annual convention of the American Historical Association in December 1976. A symposium on naval history at the US Naval Academy, scheduled for late October 1977, will feature a session on ULTRA in the Battle of the Atlantic, with participants from Britain, Germany, and the United States. It should break ground for more intensive examinations of the place of ULTRA in the wartime experience of the three services of the United States and Britain.

It is to be hoped that the service

departments will give support to studies on ULTRA's effects on the course of the war on land, on the seas, and in the air. Virtually nothing has been said in these pages about the important American side of the ULTRA story, which is much more than just "a chapter by itself." This is currently a subject of intensive study by Ernest L. Bell and possibly others. One may trust, further, that German and Italian studies on the impacts of ULTRA as seen from the Axis angle will receive encouragement in official quarters in the two countries.

Whatever the verdict on the hotly debated question of whether the ULTRA revelations require a "complete" rewriting of World War II history, there can be no argument that they will demand the reexamination of a vast complex of historical problems. Reexamination ever requires new avenues for thought and, most often, renewed use of the pen. Generalization on just how much will have to be "rewritten" is often a play with words. Group Captain Winterbotham will have much support in saying: "No history of World War II is complete which does not take into account our knowledge of our enemy's intentions, disclosed by our 'most secret source.'"³⁰

NOTES

1. F. W. Winterbotham, *The Ultra Secret* (New York: Harper and Row, 1974).

2. A string of such "revelations" is listed in Gustave Bertrand's *Enigma ou la plus grande énigme de la guerre 1939-1945* (Paris: Plon, 1973), p. 13.

3. David Kahn, *The Codebreakers* (New York: Macmillan, 1967), p. 649.

4. Churchill employed "Boniface," thinking that if enemy intelligence should stumble on this name it would assume that he was relying upon a super agent.

5. The latter figure is from Bertrand, p. 15. Peter Calvocoressi in a BBC broadcast of 27 January 1977 speaks of 8,440, of which 83 percent are said to have been the work of Bletchley.

6. *Ibid.*

7. As related by Lord Gort. Winterbotham, pp. 34-35.

8. As related by Menzies. Bertrand, p. 256.

9. David Kahn, address to a meeting of the American Historical Association, 29 December 1976. Hereafter cited as Kahn, AHA Address.

10. Telford Taylor, address to a meeting of the American Historical Association, 29 December 1976. Hereafter cited as Taylor, AHA Address.

11. Winterbotham, pp. 61-62.

12. Juergen Rohwer, address to a meeting of the American Historical Association, 29 December 1976. Hereafter cited as Rohwer, AHA Address.

13. This and other developments are described in fascinating detail in Patrick Beesly's *Very Special Intelligence: The Story of the Admiralty's Operational Intelligence Centre, 1939-1945* (London: Hamish Hamilton, 1977).

14. Though this is the period of the destruction of the *Bismarck*, this famed ship is not to be counted among the victims of ULTRA. Once again the credit must go to direction finding and traffic analysis. There is a brief chapter on this in Beesly, pp. 75-87.

15. This does not apply to Gibraltar convoys, with which the Germans had visual contact via land-based Focke-Wulf Condor planes.

16. Rohwer, AHA Address.

17. *Ibid.*

18. Beesly, p. 153.

19. Patrick Beesly, "Naval Intelligence in the Nuclear Age: From Two World Wars—Six Still Valid Lessons," *Navy International*, (British) (April 1977), p. 8.

20. The principal aspects of this are capsulated in Sir John Masterman's *The Double Cross System in the War of 1939 to 1945* (New Haven: Yale University Press, 1972).

21. In conversations with the present writer in the summer of 1938, Colonel Walter Nicolai, the G-2 (intelligence chief) of the Great General staff of World War I, claimed that with the one exception of their mid-July offensive, the Germans had achieved tactical surprise in every one of their offensives, whereas the Allies only did so in the instance noted.

22. Taylor, AHA Address.

23. Sir David Hunt, letter to *The Times* (London) under the heading, "The Ultra Secret," *Times Literary Supplement*, 9 July 1976.

24. Anthony Cave Brown, *A Bodyguard of Lies* (New York: Harper & Row, 1975).

25. William Stevenson, *A Man Called Intrepid: The Secret War* (New York: Harcourt, Brace, Jovanovich, 1976).

26. Peter Calvocoressi, "When Enigma Yielded Ultra," *The Listener*, 27 February 1977.

27. William Bundy, in a letter to *The Washington Post* of 10 December 1974, voices unequivocally that without ULTRA "the chances of any second front whatever would have been small." The comment is of interest as the view of one ULTRA operative of its near-decisive role in this instance.

28. Calvocoressi.

29. *Ibid.*

30. Winterbotham, pp. 1-2.

