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## William Friedman and Pearl Harbor

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### ABSTRACT

Pearl Harbor was a seminal event for pioneering American cryptographer William Friedman and the subject of an analysis he wrote after retiring from government in the mid-1950s. While Friedman's conclusions are not particularly innovative, the way in which he arrives at them is and also accounts for how he and his contemporaries were both surprised and not surprised by the Japanese attack.

In April 1962, one of the most prominent figures in American codebreaking before and during World War II delivered a lecture at an unlikely venue: Washington D.C.'s Folger Shakespeare Library. The presenter was William Friedman, known then for having led a team that in the fall of 1940 broke the cipher that the Japanese used to protect their most sensitive diplomatic communications. He is perhaps better remembered today for his work during the 1930s to build a cryptanalytic organization for the War Department, the Signal Intelligence Service (SIS), and for his later work as an educator and historian.

Friedman's lecture on 'Shakespeare, Secret Intelligence, and Statecraft' discussed the author's use of espionage as a theme in his plays. Friedman spent most of his time reviewing the play *Henry V* and how the interception of correspondence exposed a plot against the King. Toward the end of his talk, however, he introduced several lines from a second play, *King John*, where that King learns to his surprise that an army has mustered in France for war against England. 'Never such a pow'r; a messenger tells him, 'for any foreign preparation / was levied in the body of a land.' To which the King replies:

K. John: O, where has our intelligence been drunk?

Where hath it slept? Where is my mother's care,

That such an army could be drawn in France,

And she not hear of it?

Pearl Harbor was a seminal event in Friedman's life, as it was in the lives of many Americans of his generation. In breaking Japan's highest-level diplomatic cipher, which the SIS designated 'Purple,' he and his team provided the Roosevelt Administration with a direct view into the formulation of Japanese foreign policy during late 1940 and all of 1941. Unfortunately, it was virtually the only clandestine source Washington had. Most notably, the codes the Japanese Army and Navy used to protect their communications remained invulnerable. Nevertheless, particularly when viewed in retrospect by the various Pearl Harbor investigations, the decrypts that the SIS and its Navy counterpart, OP-20-G, produced from Purple contained tantalizing clues regarding Tokyo's intentions. Friedman himself would be called to testify before several of these investigations.

Later in life, Friedman periodically returned to the question of why America had been so badly surprised by the Japanese attack. His most detailed reexamination of the role of intelligence in the months

leading up to Pearl Harbor came in the mid-1950s after a group of so-called 'revisionist' historians began to challenge the conclusions made by a Congressional inquiry immediately after the war ended that the two local commanders on Pearl Harbor – Admiral Husband Kimmel of the Navy and the Army's Lieutenant General Walter Short – bore almost exclusive responsibility for America's Pacific Fleet and Air Force being taken so badly by surprise. Friedman systematically debunked the claims of the more extreme of these revisionists that President Roosevelt had deliberately withheld vital intelligence from Kimmel and Short that would have warned the two officers of the pending Japanese attack. He also concluded, however, that Kimmel and Short were not solely to blame.

Instead, he argued, the more serious deficiency was not so much in personal leadership as it was in the structure and capacity of America's intelligence organizations. Washington had dedicated insufficient resources to the collection of intelligence during peacetime and, even more critically, had failed to create a capability for analyzing what little information it had, something that in Friedman's view just might have enabled the U.S. to anticipate the possibility of a Japanese strike on its most important military base. While Friedman's conclusions here are not particularly innovative, in that they generally follow those of the postwar investigation by Congress, the way in which he arrives at them is and also accounts for how he and other members of the SIS were both surprised and not surprised by the Japanese attack.

## Friedman and 7 December 1941

In December 1940, several months after the SIS broke Purple, Friedman experienced a medical event that he characterized as a nervous breakdown. Having been hospitalized at Army medical facilities in Washington, he was released in April 1941, received an honorable discharge from the Signal Corps reserve, where he held a commission of Lieutenant Colonel, and returned to the SIS as a civilian.

Friedman was not involved in the day-to-day decryption and translation of Japanese diplomatic messages from the time he went into the hospital through the morning of December 7. He later characterized this period in the following way:

I was not directly engaged in it because ... I had been ill, had had a nervous breakdown .... when I came back to duty after I was discharged from Walter Reed, Gen. Mauborgne [Joseph Mauborgne, head of the Signal Corps, the SIS's parent organization in the Army] and Col. Minckler [Rex Minckler, Friedman's successor as head of the SIS] told me I was to take it easy and come and go as I pleased. I used to come in about a half hour or an hour late in the morning and leave a half hour before the end of the day so as to avoid heavy traffic. I was not in direct touch with the cryptanalytic work, although I did see, whenever I wanted to, the messages that came out.<sup>2</sup>

Consequently, on Sunday, December 7, Friedman almost certainly was not in the office at the time of the Japanese attack, reports of which began arriving in Washington just before 2:00 pm This was true of nearly all other SIS personnel. Its offices in the Munitions Building had been staffed the morning of the previous day, a Saturday. Shortly after noon, its longest serving Japanese linguist, John Hurt, completed one of the last translations of a Purple decrypt for the day – the so-called 'pilot' cable instructing Tokyo's representatives in Washington, Ambassador Kichisaburo Nomura and Special Envoy Saburo Kurusu, to stand by for a fourteen-part message that would turn out to be Tokyo's notice it was breaking off negotiations. At this point, Hurt went home only to be called shortly thereafter by Major Harold Doud, head of SIS's cryptanalytic section, who told Hurt to return to work. Hurt prepared to head back but was waved off by a second call from Doud, who told him to come in 'a little after midday on Sunday.' Hurt arrived at SIS at the appointed hour on December 7 to find just two or three people on duty. After word of the attack began to spread, however, he said that 'personnel began to rain in.'<sup>3</sup> Some may have come from a picnic that SIS personnel attended that afternoon.<sup>4</sup>

Friedman could have been among them. Like most of his colleagues, he presumably was at home when he received word of the attack. Hurt implied Friedman might have been one of the personnel who reported to the office the afternoon of December 7. 'The news reached us,' Hurt later recalled, 'and we were amazed – amazed not at the fact but at the place of the attack. Mr. Friedman understood the matter, and he, too, felt exactly as we did.'<sup>5</sup>

The recollections of another SIS veteran, Frank Rowlett, shed additional light on events at SIS headquarters in the hours before the Japanese attack. Rowlett had been a member of the SIS team that had broken Purple in 1940. On the morning of December 7, he would tell historian David Kahn years later, 'I had been working all night and [was] so tired I couldn't sleep and my wife said take them [their sons Frank and Tom] for a walk and you'll feel better.' While having lunch with his family after his walk, Rowlett heard a radio broadcast with news of the strike on Pearl Harbor. 'So I folded my napkin, put my clothes back on, and headed for the Munitions Building.' 'I thought "Shit" to myself,' he continued.

We knew war was going to happen but not when or where or how. I felt mad .... We had no [advance] word of the bombing. It happened as a complete surprise. There was no indication that any air attack was planned on PH. [The] code destruction message was first indication of anything unusual.<sup>6</sup>

This 'code destruction message' was sent on December 2 by the Japanese Foreign Ministry to its embassy in Washington and instructed Nomura and Kuruusu to burn most documents related to the codes and ciphers used for secure communications and destroy one of the embassy's two Purple machines. The cable was decrypted by the SIS the following day. According to Rowlett, in the weeks prior its arrival,

those of us who had access to the translations of Japanese diplomatic intercepts had become more and more convinced that war between the United States and Japan was inevitable, and it was only a matter of time before it would start.<sup>7</sup>

While Rowlett was reading the translation of the code destruction message, he was approached by Colonel Otis Sadtler, a Signal Corps officer who headed its Operational Branch and was SIS chief Minckler's immediate superior. Sadtler had come to Rowlett's area with a copy of the translation. After some discussion about the message and having heard Rowlett rule out one reason after another why Tokyo would have sent it, Sadtler exclaimed, 'Rowlett, do you know what this means? It can mean only one thing, and that is that the Japanese are about to go to war with the United States.' The 'code destruction' message prompted this reaction from an Army Colonel who was closely monitoring incoming intelligence. However, Rowlett later argued that it failed to capture the attention of President Roosevelt or of the War and Navy Departments. Instead, he claimed, the 'pilot' message of December 6 'probably was ... the real message that got everybody on the alert.'<sup>8</sup>

In a 1976 interview, Rowlett agreed with Hurt that on Saturday, December 6, the SIS had wound up operations for the day at noon. Rowlett's account goes beyond Hurt's, however, by explaining why the SIS would close up shop at such a critical moment. 'We'd been working too much overtime,' Rowlett noted,

and the Civil Service regulations required that we be given credit for any overtime hours we spent and so a decision was made ... that we wouldn't have any more overtime and everyone would be sent home whether the work was done or not and so [at noon on December 6] we were actually sent home.<sup>9</sup>

According to Rowlett, once Hurt's translation of the 'pilot' message reached Army Intelligence, 'which didn't have this overtime problem that the Signal Corps had,' it ordered Minckler to bring people in to await the promised fourteen-part message. The first sections began to arrive 'around supper time,' in Rowlett's recollection. They made clear that there would be no need to call in Japanese linguists such as Hurt because when decrypted they turned out to be in English. The remaining parts, with the critical exception of the fourteenth – containing the vital concluding statements that 'the earnest hope of the Japanese Government ... to preserve and promote the peace through cooperation with the American Government has finally been lost' and that 'in view of the attitude of the American Government ... it is impossible to reach an agreement through further negotiations,' signaling a break in diplomatic relations – had been received and decrypted by the early hours of the morning.

The fourteenth part appeared 'sometime after breakfast' and, in Rowlett's words, 'we cranked it out right fast.' He also would note that a separate decrypted message with instructions that Nomura was to deliver the fourteen-part message to Secretary of State Cordell Hull at exactly 1:00 'bothered us.' Rowlett claimed, however, that it was only retrospect that one could look back and see 'that the time of Pearl Harbor is identified but there's nothing to indicate the place of Pearl Harbor ....' 'I think,' Rowlett

summed up, 'some people talked about what might be happening but nobody ever dreamt that the Japs would bomb Pearl Harbor.'<sup>10</sup>

Writing after the war, Hurt agreed with Rowlett's assessment but for different reasons. Hurt claimed that he and other SIS veterans knew a few months before Pearl Harbor that an attack was coming. He went even further than Rowlett with regard to the 'pilot' message, claiming to have believed at the time that it indicated 'Japan would surely attack us in the early afternoon of the following day.' Like Rowlett, however, he argued that no one in the SIS suspected that Hawaii would be Tokyo's target. In retrospect, moreover, he believed it was impossible for the SIS to have known this. This was not, in Hurt's view, because there were no indications in the Purple messages that he was translating to suggest Pearl Harbor as a possible venue for a Japanese strike. There were. Instead, he said, the SIS 'was too small and too exhausted to be that analytical. We were all too worn out to isolate and retain single details, uniquely important as they turned out to be.'<sup>11</sup>

'This was true up and down the line,' he continued, 'to the point where we were in the paradoxical position of knowing and yet not knowing.' While Hurt remembered a series of messages six weeks before the attack suggesting Japanese interest in the movements of ships at Pearl Harbor, he also noted that 'by then our analytic powers were diminished by anxiety and fatigue.' Moreover, he said, 'immediately after these messages, diplomatic messages of the most drastic urgency flooded in in such immense numbers that we forgot the particular references to Hawaii.' Complicating matters further, at this time the War Department had only two Japanese linguists able to translate Japanese accurately and rapidly, Hurt being one of them. 'There were others,' Hurt said, 'but their production was slower and less sure.'<sup>12</sup>

Even if there were a growing sense among SIS officers before Pearl Harbor that an outbreak of hostilities between the United States and Japan was only a matter of time, none foresaw Oahu as the place where war would begin. This combination of expectation and surprise helps explain a remark attributed to Friedman that is sometimes read to imply he believed Washington had enough information to warn its two commanders in Hawaii, Admiral Husband Kimmel and General Walter Short, that an attack was imminent.

According to Friedman's biographer Ronald Clark, Friedman's wife Elizebeth recalled that

Friedman himself, hearing the news of the Pearl Harbor attack on the radio, at first found it difficult to believe. For some while ... he could do no more than pace back and forth across the room, muttering to himself over and over again: 'But they knew, they knew.'<sup>13</sup>

Hurt related a similar anecdote involving Friedman, one from ten days before the attack. Visiting friends suffering from tuberculosis at the Glen Dale Sanitarium in suburban Washington, Friedman asked Hurt what he made of the current state of relations between the U.S. and Japan. Hurt said that negotiations between Washington and Tokyo seemed to be at an end, and asked Friedman what he thought would happen next. Friedman replied, 'It means war.' A stunned Hurt anxiously questioned whether the U.S. was ready for the looming hostilities, to which Friedman said only, 'I hope so.'<sup>14</sup>

While the immediate shock of the attack may have led Friedman to believe for a time that there had been enough information to have prevented it, it seems more plausible that like others in the SIS, he was surprised not so much by the fact that war had finally come as by where and how it began. Indeed, having introduced Elizebeth's recollection of her husband pacing the floor and repeating 'But they knew, they knew,' Clark immediately qualified it by citing comments Friedman later made to a nephew who had asked him whether Roosevelt had foreknowledge of the attack. 'There were no messages,' Clark quoted Friedman as saying, 'which can be said to have disclosed exactly *when and where* the attack would be made. Hence I do not see how President Roosevelt could have avoided the attack by advance knowledge from reading such messages.' Yet at the same time, Clark noted, Friedman also clearly believed that 'warnings which had been intercepted, deciphered, and passed on during the fortnight preceding Pearl Harbor were sufficient to alert reasonable men that an attack was coming.'<sup>15</sup>

## **Friedman's 1957 Pearl Harbor study**

Friedman's study of Pearl Harbor bears the unusual, somewhat opaque, and arguably cumbersome title *Certain Aspects of 'Magic' in the Cryptological Background of the Various Official Investigations into the*

*Attack on Pearl Harbor*. Like ‘Ultra,’ used by the British to denote intelligence coming from the breaking of the German Enigma machine, ‘Magic’ was a general term used by American officials to describe the fruits of their codebreaking efforts. Friedman’s work discusses in some detail a number of the key decrypts that the SIS produced prior to 7 December 1941. However, as the title of his work suggests, he does so not so much retell the story of the period leading up to the Japanese attack as he illuminates the several investigations that followed it and seeks to both understand what happened and determine who if anyone was to blame. The particular investigations he is interested in are not so much the six official inquiries but rather the so-called ‘revisionist’ ones – accounts that began to circulate during the war but gathered strength after its conclusion. By the time Friedman began work on his study in the mid-1950s, they had become a significant force in the ongoing historical debate over Pearl Harbor.

### **Revisionist histories of Pearl Harbor**

The first revisionist historians of Pearl Harbor were not a unified group. Instead, they reflected a spectrum of opinion about the policies and actions of the Roosevelt Administration prior to the Japanese strike. At one end were those who argued Roosevelt had intelligence that provided unambiguous warning of the pending attack but deliberately suppressed it and in particular made sure it was not sent to Kimmel and Short. At the other were those who claimed that, even if Roosevelt in fact had no such intelligence, he nevertheless intentionally created circumstances under which Tokyo eventually had no option other than war. Specifically, according to this school of revisionism, Roosevelt progressively tightened sanctions aimed at curbing Japanese expansionism but then set terms for lifting them that he knew Tokyo could not accept, such as ending its longstanding war with China.

Friedman’s study, which was written under contract with the National Security Agency and completed in 1957, focused primarily on the presence of certain strands of revisionist thinking in two of the first post-war accounts by American participants. These were the memoirs of Admiral Kimmel, published in 1955, and a 1954 book by one of his key subordinates, Rear Admiral Robert Theobald’s *The Final Secret of Pearl Harbor*.

Of the two, Theobald’s made the more direct attack on Roosevelt, Army Chief of Staff George C. Marshall, and Chief of Naval Operations Harold Stark, claiming that ‘there would have been no Pearl Harbor if Magic had not been denied to the Hawaiian commanders’ and that Roosevelt had ordered Marshall and Stark to withhold it. Kimmel did not go so far as to argue for such a conspiracy. He did, however, point to case after case where a vital piece of intelligence had not been sent to Hawaii, positing that had he received such information early enough he would have ordered the Pacific Fleet to sortie and ambush the Japanese at sea. Even if he had received it as late as the morning of December 7, he argued, he still could have taken defensive measures that would have inflicted greater damage on the Japanese attackers and lowered the loss of American life and ships. Finally, in his most damning remark, he claimed that Washington had used ‘the Pacific Fleet and the Army forces at Pearl Harbor as a lure for a Japanese attack.’<sup>16</sup>

### **Japanese diplomats’ knowledge of the Pearl Harbor attack plan**

Friedman saw revisionist histories as having three common elements. First, that Roosevelt knew from decrypted Japanese communications not just that Tokyo planned an attack on the United States but also – and crucially – ‘the exact time the attack would be made and the exact place they were going to make it.’ Second, that Roosevelt not only withheld this information from Kimmel and Short but ‘deliberately misled [them] as to the real situation, misled to the point, in fact, that when the attack came they were entirely unprepared even to meet it, let alone repulse it.’ Third, and finally, that Roosevelt could not have achieved this deception alone but ‘had to have as reluctant partners in his *conspiracy*’ General Marshall and Admiral Stark.<sup>17</sup>

‘The real essence of the problem,’ as Friedman saw it, was the revisionists’ first point: that SIS decrypts of Japanese communications provided unambiguous warning that the Japanese would attack Pearl

Harbor on the morning of 7 December 1941. Without that information, Friedman argued, Roosevelt would not have been able to deceive Kimmel and Stark as he allegedly did and force them in a position where, by relying solely on whatever fragmentary and inconclusive information was available to them, they would be in the dark as to Japanese intentions and thus completely surprised by the attack when it came. Any 'conspiracy' with Marshall and Stark would have been moot as well.<sup>18</sup>

Friedman chose an innovative departure point for his rebuttal of the revisionists' claims, one unavailable to revisionists of the early 1950s such as Kimmel and Theobald, namely the memoirs of the Japanese Foreign Minister at the time of Pearl Harbor, Togo Shigenori, which were published in English translation in 1956. Friedman opted for this starting point for a reason. The only encrypted Japanese communications that the United States was breaking with any regularity in the months before Pearl Harbor were the diplomatic ones in the Purple code. No encrypted high-level military communications – neither those of the Japan's army nor, critically, its navy – were being read with any frequency. As Friedman put it:

It must be noted, and indeed emphasized ... that at the time of the attack the only cryptographic systems which the U.S. cryptanalytic agencies had solved and were able to read were *not* the Japanese military or naval systems; they were only the systems used by the Foreign Office. Whatever intelligence the U.S. authorities were able to obtain from Magic therefore must have been ... derived from Japanese diplomatic communications.<sup>19</sup>

In Friedman's view, a simple but crucial test for assessing whether decrypts of Japanese diplomatic communications could have alerted Roosevelt, Marshall, or Stark to the Imperial Navy's intent to strike Pearl Harbor was to determine how much Tokyo's Foreign Minister and other diplomats knew about the military's plans for the attack, its timing, and its target. Togo's memoirs thus became a key piece of evidence.

The memoirs contain a passage in which Togo describes a November 30 meeting of a Japanese government body called the Liaison Conference, where the final decision to go to war was made. The Liaison Conference, consisting of the most senior Japanese civilian and military officials, was formed in July 1940. Togo drew a clear distinction between what he claimed was an erroneous finding at his trial before the post-war International Military Tribunal for the Far East (IMTFE) alleging his foreknowledge of the military's plan to strike Pearl Harbor and his actual ignorance of that intent.

One thing which – needless to say – was not discussed in the Liaison Conference was operational aspects of the impending hostilities. It was disclosed at the IMFTE that the naval task force under Admiral Nagumo has sailed from Hitokappu Bay on 26 November under orders to strike Pearl Harbor, and in its judgment the tribunal made the absurd finding that the scheduled attack was freely discussed at the meeting of the Liaison Conference on 30 November. We had, of course, no knowledge of the plan; it was the invariable practice of the high command not to divulge to civilian officials, such as us, any scrap of information bearing on these highly secret operations, and anyone familiar with the system will readily understand our total lack of knowledge of them. (This condition is sufficiently well illustrated by the fact ... that [Prime Minister Hideki] Tojo told me that it was only at the IMTFE trial itself that he first learned any operational details of the Pearl Harbor attack; a mass of additional evidence was adduced at the trial showing that the civilian members of the cabinet had no prior knowledge even of the existence of the plan to attack Hawaii.)<sup>20</sup>

For Friedman, Togo's claim of ignorance of the military's plans, if true, raised fundamental doubts about the arguments of the more extreme revisionists. For 'if Togo was telling the truth ... then the Magic messages themselves ... could not possibly have contained any information, let alone a clear-cut statement on this very important point.'<sup>21</sup>

A question that therefore became imperative for Friedman to answer was whether Togo had told the truth in his memoirs. To address this issue, Friedman turned to the Magic messages themselves. At first glance, he admitted, 'it seems fantastic, it stretches credulity, to believe that Togo did not *know* what was being planned.' As an example of a message creating this impression, he cited the so-called 'deadline' cable that Togo sent to Nomura and Kurusu on November 22. Having earlier in the month set a deadline of November 25 for reaching a settlement, Togo informed his two envoys that he had obtained four additional days, i.e., until November 29 – 'let me write it out for you – twenty-ninth'; he added emphatically – for them to reach an agreement. 'After that,' Togo added ominously, 'things are automatically going to happen.'

However, Friedman cautioned that it was important to remember not to read the ‘deadline’ cable with the benefit of hindsight, as that risked creating a very different impression from that created when it was originally read before Pearl Harbor. In that light, Friedman argued there was ‘not a single message that can be said to contain categorical evidence proving that Minister Togo *must have known* that Pearl Harbor was to be the target.’<sup>22</sup>

Friedman turned out to be partly wrong about Togo’s knowledge of Japan’s plans to strike the United States. Information that became available ten years after Friedman completed his study indicated that what Togo actually knew was slightly more than he acknowledged in his memoirs. According to records of the prewar Liaison Conferences published in 1967, at the ‘war decision’ meeting of November 30, Togo insisted that Imperial Japanese Navy Chief of Staff Admiral Nagano Osami tell him when ‘zero hour’ would be. ‘Otherwise,’ Togo emphasized, ‘I can’t carry on diplomacy.’ In response, Nagano quietly informed Togo that it was set for December 7. According to the notes of the Conference, Togo then asked whether Nomura and Kurusu still ‘had to be kept in the dark’ but was told, ‘Our diplomats will have to be sacrificed. What we want is to carry on diplomacy in such a way that until the very last minute the United States will continue to think about the problem, we will ask questions, and our plans will be kept secret.’<sup>23</sup> Although Togo still lacked the precise target, knowledge of the date of the attack and the need for Washington to continue to believe talks were continuing for it to succeed led him to instruct Nomura and Kurusu on November 30 not to do anything that would ‘give the impression that negotiations are broken off.’ Friedman’s overall point remains valid, however. At most, Togo knew only the date on which hostilities with the United States would commence. He did not know the specific place or the exact time for the attack, at least not until the early morning hours of December 7, when in the ‘pilot’ cable he sent set the exact time for the delivery of the fourteen-part message in Washington at 1:00 pm that day, or 8:00 am in Honolulu.

### ***Withholding magic decrypts and decryption capabilities from Kimmel and Short***

Friedman next turned to two related questions, each raised by revisionist historians to support their contention that Roosevelt intentionally left Pearl Harbor vulnerable to an attack. First, why were Kimmel and Short denied access to the intelligence from decrypts of Japanese diplomatic cables? Second, why was it that, unlike General MacArthur in the Philippines, Kimmel and Short were not given one of the machines that the SIS had developed to decrypt Purple transmissions – the so-called ‘Purple analog’ – some of which were being intercepted on Oahu itself? Some revisionists found the latter particularly damning as earlier in 1941 the United States had supplied exactly this capability to Britain’s codebreakers at Bletchley Park.

Friedman argued that the real reasons that Magic decrypts were withheld from Kimmel and Short were far simpler and ‘more logical’ than those offered by revisionist historians. First, he claimed that as the SIS and its Navy counterpart, OP-20-G, produced more and more decrypts from Purple, ‘the strategic value of our solution of that cryptosystem became increasingly apparent’ to senior officials in Washington, prompting them to shroud it in greater and greater secrecy. Second, Friedman noted that while in early 1941 Washington had sent to Hawaii a few summaries of intelligence derived from Magic decrypts, this practice was discontinued out of fear that ‘if Magic continued to be sent ... the secret that we were able to read *all* [Japanese] diplomatic cryptocommunications, including “Purple,” their most secure system, would find its way to the Japanese.’ Friedman noted testimony by the Army’s Deputy Chief of Staff for Intelligence, Brigadier General Sherman Miles, before the postwar Joint Congressional Committee investigating Pearl Harbor, that the fear that Japanese codebreakers could do to these supposedly invulnerable communications exactly what Friedman and the SIS had done to Purple was a major factor in the decision not to send even brief summaries of Magic to Kimmel and Short.<sup>24</sup>

As for the revisionists’ second argument about Magic being withheld from Kimmel and Short, Friedman did not contest their claim that the Purple decryption machine sent to Bletchley Park could have gone to Oahu instead. However, Friedman argued there were very good reasons why the decision was made to ship one to the UK and not Hawaii. ‘It is very important to understand,’ he wrote,

that the British had not only extensive facilities for intercepting and forwarding Japanese diplomatic traffic to London but they also had a corps of very competent cryptanalysts and Japanese translators – without whom possession of the ‘Purple’ machine would have been of little or no value.

They also, he continued, ‘were able to read and translate other systems carrying Japanese traffic – and they did so not only in London but also at Singapore and Hong Kong, and possibly one or two other strategic outposts under the British crown.’<sup>25</sup>

Friedman argued that, in contrast, the Army and the Navy lacked sufficient cryptanalysts and Japanese translators to spare many of them for overseas assignments, including Hawaii. Each Service had to make choices about posting such personnel overseas and any deployments of the few available Purple decryption machines. As the Philippines was assessed to be the likely target for any attack by Japanese, the Navy monitoring station there received one of the scarce devices, whereas Hawaii did not, especially as the cryptanalysts and linguists at its station on Oahu were already fully engaged trying to break the cryptographic systems of Japan’s navy. Additionally, Friedman noted, the small two- or three-person Army unit there had been withdrawn in 1939 because of its expense and the need for personnel back in Washington.<sup>26</sup>

### ***The winds code***

Friedman’s study also addressed a decrypted Japanese message that became one of the most enduring controversies about Pearl Harbor. This was the message that contained the so-called Winds Code. On 19 November 1941, the Japanese Foreign Ministry sent a cable to its Washington embassy that read as follows:

In case of emergency (danger of cutting off of our diplomatic relations) and the cutting off of international communications, the following warning will be added in the middle of the daily Japanese language short wave news broadcast: (1) In case of a Japan-U.S. relations in danger, East Wind Rain; (2) Japan-U.S.S.R relations, North Wind Cloudy; (3) Japan-British relations, West Wind Clear. The signal will be given in the middle and at the end as a weather forecast and each sentence will be repeated twice. When it is heard, please destroy all code papers etc. This is as yet to be a completely secret arrangement.

This decrypt became known as the Winds Code ‘Set Up’ message. The as yet unsent one that would be broadcast in the clear was designated the ‘Execute’ message. American monitoring stations began an intensive search for it.

None of the multiple investigations into Pearl Harbor found documentary evidence of an authentic Winds Code ‘Execute’ message being sent prior to the Japanese attack.<sup>27</sup> Nevertheless, there have been persistent claims one was. Some have gone so far as to charge that after Pearl Harbor, Marshall ordered all copies of a purported ‘Execute’ message destroyed as part of an effort to eliminate any evidence that Roosevelt (and Marshall himself) had information that could have alerted Kimmel and Short to the looming danger but intentionally withheld it from them.

Friedman became enmeshed in the Winds Code controversy after conversations he had in 1944 with Captain Laurance Safford, head of Navy cryptanalysis at the time of Pearl Harbor and a leading proponent for the existence of an actual Winds ‘Execute’ message. Safford had told retired Navy Admiral Thomas Hart – who in 1944 conducted a one-man inquiry into Pearl Harbor for his Service – that a Navy monitoring station on Bainbridge Island in Washington State had intercepted a Winds ‘Execute’ message the evening of December 3, with Safford seeing it in Washington D.C. the following morning.<sup>28</sup>

Friedman was aware of Safford’s claims when he testified before a 1944 Army inquiry conducted by then-Colonel Carter Clarke. Asked whether he had any knowledge of the November 19 Winds ‘Set Up’ message, Friedman stated that to the best of his recollection he was aware of it at the time, notwithstanding the fact that he remained on restricted duty during this period due to his hospitalization earlier in the year. As to whether he subsequently had seen a Winds ‘Execute’ message, Friedman claimed to have learned of one’s alleged existence only as a result of his recent conversations with Safford. ‘If I did know it at the time,’ Friedman added, ‘I have forgotten it.’<sup>29</sup>



Clarke, unsurprisingly, asked Friedman to check SIS records and determine whether any suggested a Winds 'Execute' message had been sent prior to Pearl Harbor. Having reviewed them, Friedman told Clarke he had found no record of one. Noting he had made a 'diligent search' but not a 'completely exhaustive' one, Friedman stated that 'thus far, I have not found a single bit of evidence to indicate that an Army station actually intercepted a Winds Execute message.'<sup>30</sup>

In notes written around the time of the Clarke investigation, Friedman made this point more emphatically. 'No written record exists,' he claimed, 'which would indicate that *any* plain text message was received by SSA which might possibly in any regard be considered as the "Winds Execute" message.' Friedman also had spoken with a number of personnel who had served in the SIS before Pearl Harbor and found that none could recall ever having seen one. These included two senior SIS officers, Robert Ferner and Leo Rosen, neither of whom had any recollection of any such message, with Ferner certain that if he had seen one 'it would have stuck in his mind.' As for Frank Rowlett, he had heard at some point that an 'Execute' had been intercepted. Rowlett added, however, that it was clear to him that statements about an authentic one were a matter of hearsay. He also did not recall who had told him.<sup>31</sup>

Friedman's mind was even more settled when he revisited the Winds controversy in his mid-1950s study of Pearl Harbor. By then it was clearer to him that no Winds 'Execute' had ever been sent, as in the intervening years evidence had come to light that what actually had been overheard at Bainbridge Island, was not an authentic 'Execute' but a routine Japanese weather report. While initially this report was thought to have been a real 'Execute,' when intelligence officers in Washington inspected it closely they found it did not contain the wording an actual one would have to have had, nor for that matter was it repeated or in the intended positions – middle and end – of the news broadcast, as the Winds 'Set Up' message had directed. As Friedman characterized this 'False Execute' message, it

resembled what an Execute message might have been but when carefully scrutinized it just didn't meet all of the conditions specified in the code instructions. The alarm it set off subsided as soon as the discrepancies with what a real Execute message should have been were recognized.<sup>32</sup>

Summing up his assessment of the Winds controversy, Friedman questioned why the Japanese would have sent an actual Execute message, given the secrecy that surrounded Tokyo's planning for the strike on Pearl Harbor and the radio silence that its carrier force maintained after setting out from Japan. In such circumstances, Friedman doubted the Japanese would have risked tipping their hand by sending a Winds 'Execute.' Why, he reasoned, would they jeopardize the success of the attack as the hour approached for their aircraft to attack Oahu? More to the point, Friedman noted,

one thing was established after exhaustive investigation by the several Pearl Harbor boards, including the Joint Congressional Committee: the Japanese never did send out an *authentic* 'Winds Code Execute' message which clearly indicated that Japan was going to attack the U.S.

Moreover, Friedman wrote, 'the most the message could have confirmed was that there was going to be a *break in relations* between Japan and the country signified by the particular "Winds Code Execute" message.' It would not have signaled the onset of military operations, as suggestive as it might have been with regarding to their imminence, much less identified the likely targets of a Japanese attack.<sup>33</sup>

## Conclusions

On the classic question about Pearl Harbor – who was responsible for allowing the United States to be surprised? – Friedman noted that his mid-1950s review had led him to change his mind from where it had been in the immediate aftermath of the Japanese attack. 'I must confess,' he admitted, 'I think that Kimmel and Short were not as culpable as I first thought that they were back in 1941–1942, despite all of the "warnings" sent to them.' Friedman also found himself more sympathetic to the views of two members of the postwar Joint Congressional Committee, Homer Ferguson (R-Mi.) and Owen Brewster (R-Me.), who filed a report dissenting from the Majority and arguing that military and political leaders in Washington were more to blame.<sup>34</sup>

It is the actions of the military Services and their relationship to their intelligence components, however, that were the primary focus of Friedman's concluding analysis. 'The Intelligence Services,' he claimed, 'come off rather easily [in the Congressional investigation] – too easily in the fixing of responsibilities and pointing out derelictions.' The main flaw he saw in Army and Navy intelligence prior to Pearl Harbor was the failure to designate someone

whose important, if not sole duty, was to study the whole story which the Magic messages were unfolding and which played so important a part in our failure to deduce that the Japanese were planning a surprise attack on the U.S. Fleet at Pearl; *there was nobody whose responsibility it was to put the pieces of the jigsaw puzzle together.*<sup>35</sup>

Friedman provides several reasons for this key weakness. First, the SIS and OP-20-G had few staff in 1941 and thus no personnel to spare for a comprehensive analysis of all intercepted Japanese messages in their entirety. Those personnel they had were fully engaged in the day-to-day task of intercepting, decrypting, and translating these messages. Additionally, the tight control exercised over the distribution of Magic in Washington and the fact that only a handful of senior civilians and military officers had access to it, and even then only briefly, meant that at any one time each of these individuals was seeing 'only a single frame, so to speak, in a long motion picture film – a film which should have been shown and should have been intensely studied as a continuous series of pictures, because they were telling a story.' Friedman's point was that this film '*was simply not there to be studied and this was a very significant weakness ... in the intelligence organization of the two services.*'<sup>36</sup>

Making matters worse, in Friedman's view, was the way the two military Services organized and staffed their intelligence organizations and used the intelligence these organizations produced. In each, the signals intelligence entity was not integrated into the larger intelligence component. As a result, there was no institutional mechanism to ensure signals intelligence was used to greatest effect when analyzing information available from all sources on a specific issue. Second, personnel in the Services' signals intelligence organizations were explicitly forbidden from conducting comprehensive or longer term analysis of large sets of intercepts. Instead, they were instructed to focus exclusively on the decryption and translation of one individual message after another.

Third, and most importantly, neither the Army nor the Navy attached any particular significance to intelligence as a source of information relevant to the planning or conduct of military operations. 'In both the Army and the Navy' Friedman complained, "*intelligence didn't count* – for much, at any rate ...' Nor was this attitude prevalent only in the months leading up to Pearl Harbor. "We have never paid too much attention to intelligence," Friedman continued.

After several thousand years of experience, why do military and naval authorities pay less attention to *intelligence* than to logistics, for instance? Why does *intelligence* have to play the role of step-child in the conduct of warfare? What is it about intelligence that makes it less desirable as a career than artillery, for example?<sup>37</sup>

While Friedman did not believe there was any individual message that clearly stated the date and time when the Japanese would strike the U.S. or named Pearl Harbor as their target, he clearly thought the Magic intercepts – if examined as a whole – could have led an imaginative analyst to identify Oahu as a possible target and at least roughly estimate the date it might be hit. This was true not only in Washington but on Oahu itself. Friedman believed that had Kimmel had access to Magic – even if only in the form of summaries, which Friedman at least in hindsight thought should have been sent to the Pacific Fleet commander – 'his proximity to the scene might have led him to make the imaginative jump that was necessary in order to reach the correct solution to the astounding story that Magic was unfolding.'<sup>38</sup>

Friedman noted that the Joint Congressional Committee had reached similar conclusions about the state of intelligence at the time of Pearl Harbor. It recommended – in Friedman's characterization – that the Services create a unified intelligence service and a cadre of professional intelligence officers similar to those who specialized in logistics, naval aviation, or artillery. Ten years on, however, Friedman claimed that 'very little' progress had been made in this regard. 'In fact,' he stated categorically, 'I think it can be said that nothing has been done.' Friedman thought this to be particularly true of the Army, where 'the attitude toward intelligence does not seem to have changed very much.'<sup>39</sup>

Friedman would have been the first to admit his analysis of Pearl Harbor was not comprehensive. While limited in scope, his study is nevertheless reasoned, nuanced, and innovative. Having reviewed all of the intercepts decrypted before Pearl Harbor as well as a considerable amount of other primary source material as well as secondary ones, and having interviewed a number of the participants, Friedman concluded that while it was true that no single piece of information pointed to the target of the planned Japanese attack nor the time it would be struck, it nevertheless would not have been impossible for a thoughtful analyst with access to all Magic material to deduce that Pearl Harbor could be a possible target.

As for why this did not happen, Friedman laid responsibility at the feet of the Services and their cultures, not individuals. The SIS and OP-20-G were poorly resourced and neither had enough personnel to review all Magic messages and assess their significance. Organizationally and culturally, the Army and Navy both failed to appreciate the significance of intelligence and did not see it as important enough to link it to the planning and execution of their operations. Pearl Harbor consequently became for Friedman a clear intelligence failure, one that occurred for understandable reasons and particularly due to an institutional neglect by the Services that left their signals intelligence components ill-equipped and without a solid foundation from which the critical 'imaginative jump' might have been made.

## A summing up

Friedman's Pearl Harbor study was never published. In a cover letter forwarding it to NSA's Director at the time, Air Force Lieutenant General John Samford, he suggested it might be useful 'for historians who take a more realistic view [than the revisionists] of what happened and why the U.S. forces in Hawaii were caught by surprise.'<sup>40</sup> Although it was classified 'Secret' because of what Friedman described as 'a small amount of material' from non-public sources, he suggested that removing this could allow his work to be released as a counter to revisionist literature, among which he included the recent books by Admirals Kimmel and Theobald.<sup>41</sup>

Samford refused to support publication of Friedman's study. 'He was dubious about the advisability of raking over the dead embers, etc.,' Friedman recorded, and thought that 'the Theobald charges were balderdash and not worthy of serious attention.'<sup>42</sup> Several 'high-level personnel' at NSA's also advised Samford against allowing the work to be published. These officials thought the study contained nothing new, although 'Friedman's analysis provides some new interpretation of the facts.' 'The controversy over placing the blame for the Pearl Harbor disaster,' they concluded, 'will probably never be settled.'<sup>43</sup>

Had General Samford sanctioned release of Friedman's study, it seems likely his conclusions on why American intelligence had failed would have had little impact. Samford may have been correct that Friedman's work would instead have stoked the historical debates over whether Roosevelt had deliberately withheld intelligence from Kimmel and Short. It also seems likely that to support their claims revisionist historians would have selectively used some of Friedman's statements – such as that where he argued Kimmel and Short 'were not as culpable as I first thought that they were back in 1941–1942' or that Kimmel might have been able to make a 'imaginative jump' required to anticipate the Japanese attack had he had access to Magic – while attacking others, such as those about the Winds Code, as proving Friedman was just another Roosevelt apologist.

What would have been lost was Friedman's analysis of the institutional factors that affected intelligence prior to Pearl Harbor and his argument for intelligence preparedness in peacetime. He was right to point out that the barrier between Army and Navy cryptanalysts likely impeded progress against Japanese cryptographic systems other than Purple. The failure to assess the meaning of the decrypts of diplomatic cables between Tokyo and Washington in their entirety, as opposed to delivering them piecemeal – or, in Friedman's striking metaphor, viewing them only as individual snapshots as opposed to a series of interconnected frames in a long motion picture – also was a serious flaw in intelligence tradecraft prior to Pearl Harbor.

Finally, while one can understand the imperative placed by Washington on keeping the SIS's success against Purple secret, given the ease with which the Japanese could have changed the cipher had the

breaking of it been disclosed, it also is hard to dispute Friedman's conclusion that military communications with Hawaii were secure enough for more information from the decrypts to have been passed to Kimmel and Short. It is similarly hard to disagree with his assessment that, had Kimmel received such information, as the commander on the scene he would stand a better chance than anyone back in Washington of making the 'imaginative jump' that was necessary to identify Pearl Harbor as a target.

Friedman's analysis is incomplete at certain points. His claim that with more resources the prewar SIS could have had the same success against Japanese Army codes and ciphers that it attained in the second half of 1943 is refuted by the fact that before Pearl Harbor the SIS had intercepted precious little Army traffic. Had linguists and analysts been available, they would have had almost nothing with which to work. Even had Japanese Army communications been available to the SIS and successfully decrypted, however, it seems unlikely that Tokyo's advance into Burma, Malaya, the Dutch East Indies, and the Philippines could have been thwarted. The gap between the capabilities of the Allied forces defending these locations and the superior ones of their Japanese adversaries was simply too wide.

More likely was the possibility that sufficient damage could have been inflicted on the advancing Japanese for them not to have penetrated quite as deeply into Allied territory. This argument assumes that Allied commanders such as General Douglas MacArthur in the Philippines would have paid more attention to intelligence in the early months of the war than they did. Friedman himself criticized MacArthur for failing to take advantage of 'certain communications intelligence advantages,' which he ignored even though the Philippines was attacked nine hours after Pearl Harbor, resulting in 'the unfortunate and inexcusable loss of practically the whole of our Far Eastern Air Force on the ground.' For Friedman, MacArthur had committed 'greater errors of judgment ... than those [of] General Short and Admiral Kimmel,' with the only reason he was not similarly relieved of command attributable to MacArthur's 'appreciation of the role which a deliberately chosen type of public relations and publicity can do to enhance a commander's reputation in the minds of his countrymen.'<sup>44</sup>

As for Friedman's overall point about the importance of intelligence preparedness – or, with respect to signals intelligence, technical continuity – in understanding an adversary's capabilities and intentions, avoiding surprise attack, and supporting military operations from the moment hostilities broke out, one must acknowledge with John Keegan that even the best intelligence capabilities can prove insufficient to the task if the necessary military power is lacking.<sup>45</sup> One also must admit that with better intelligence before Pearl Harbor the United States still would have faced a serious dilemma in late 1941 due to the Japan's overwhelming advantages. As Friedman pointed out, a correct assessment of Japanese intentions, one which stronger intelligence capabilities could have rendered more likely, might have led Kimmel to sortie the Pacific Fleet in an effort to ambush his Japanese attackers.

Friedman also is doubtless correct that had Kimmel confronted the Imperial Japanese Navy at sea, he would have suffered a disaster either equivalent to or worse than he actually did with his ships at anchor on the morning of December 7. Alternatively, had Kimmel simply sailed away from Hawaii without attempting to engage the Japanese, Pearl Harbor would have been left open to the worst-case scenario: an attack on its dry docks, submarine base, and fuel depots, one which almost certainly would have succeeded in inflicting heavy damage and would have left the Pacific Fleet crippled for months due to a lack of supplies and support facilities.

Nevertheless, Friedman's argument for intelligence preparedness in times of peace remains as necessary to consider today as it was when he made it in the 1950s. His analysis of the split between Army and Navy codebreaking in the months prior to Pearl Harbor strikes a chord that would resonate in the report of 9/11 Commission, which found that a 'wall' between intelligence and law enforcement impeded effort to understand the looming threat from Al Qaeda. Also resonant with readers of that Commission's report would be his conclusion that, armed with the information from decrypts of Japanese diplomatic cables that Washington had denied him, Admiral Kimmel might have made the 'imaginative jump' necessary to deduce that Pearl Harbor was a possible target. In the Commission's view, the failure to anticipate the attacks on New York and the Pentagon were fundamentally a 'failure of imagination.'

Friedman also sounded the call to learn the lessons of Pearl Harbor in his April 1962 lecture at the Folger Library on Shakespeare and intelligence. Having introduced the passage from *King John* where

the monarch wonders at the failure to warn him of the army being formed in France against him, Friedman cited a passage from a recent article by the historian Samuel Eliot Morison to illustrate the enduring importance of maintaining robust intelligence capabilities in peacetime, favorably noting Morison's claim that in the nuclear age doing so had become more important than ever.

Since World War II the methods of obtaining intelligence and, what is more important, evaluating it and seeing that the proper people get it, have been vastly improved. But we were surprised by the North Koreans in 1950, surprised when China entered the war later that year, surprised by the failure of the attempt to invade Cuba this year, and surprised by many, fortunately short of war, moves by Khrushchev. In the cold war such as the one in which we are now engaged, it is vitally important to find out not only the capabilities of our potential enemy, but also his intentions.<sup>46</sup>

Friedman noted that the lessons Morison had drawn in 1961 from the series of surprises experienced by the United States over the previous twenty years was similar to the those drawn by Shakespeare 360 years earlier. Moreover, the challenge for modern Americans and 'all of us in the modern world' remained the same as it had been for Tudor Englishmen. This was to understand the importance of intelligence not just in war but also during peace.

## Notes

1. Friedman, "Shakespeare, Secret Intelligence, and Statecraft," 410.
2. Testimony of William F. Friedman, September 16, 1944. *Joint Committee on the Investigation of the Pearl Harbor Attack*, Part 39, "Proceedings of the Clarke Investigation," 82 (hereafter referenced as Friedman Testimony). All translations of Japanese decrypts are from the appendix to this volume of the Committee's report.
3. Untitled memorandum by John B. Hurt, annotated by Friedman as likely being written in the middle of 1944. National Security Agency. William F. Friedman Collection (hereafter referenced as NSA Friedman Collection), Document A485434. Available at <https://www.nsa.gov/news-features/declassified-documents/friedman-documents/>.
4. NSA Oral History Interview with Wilma Davis, December 3, 1982 (NSA-OH-25-82), p. 20. Available at <https://www.nsa.gov/news-features/declassified-documents/oral-history-interviews/assets/files/nsa-oh-25-82-davis.pdf>.
5. Hurt, untitled memorandum.
6. Notes from undated interview with Frank Rowlett. David Kahn Papers. Box 29, Folder 3. National Cryptologic Museum, Fort George G. Meade, Maryland.
7. Rowlett, *The Story of Magic*, 2.
8. *Ibid.*, 2–5; and NSA Oral History Interview with Frank B. Rowlett, 1976 (NSA-OH-1976-(1-10)), p. 323. Available at <https://www.nsa.gov/news-features/declassified-documents/oral-history-interviews/assets/files/nsa-OH-1976-1-10-rowlett.pdf>.
9. *Ibid.*, 323, 324.
10. *Ibid.*, 324–7.
11. Hurt, *The Japanese Problem*, 25, 26.
12. *Ibid.*, 25–8.
13. Clark, *The Man Who Broke Purple*, 169, 170.
14. Hurt, 29, 30.
15. Clark, *The Man Who Broke Purple*, 170, 171.
16. Kimmel, *Admiral Kimmel's Story*, 109–12 and 186. Theobald, *The Final Secret of Pearl Harbor*, 198.
17. Friedman, *Magic*, 6, 7. All emphasis in quotations cited in this paper is original.
18. *Ibid.*, 11.
19. *Ibid.*, 13.
20. Shigenori, *The Cause of Japan*, 115, 197.
21. Friedman, *Magic*, 13, 14.
22. *Ibid.*, 14.
23. Ike, *Japan's Decision for War*, 261, 262.
24. Friedman, *Magic*, 44.
25. *Ibid.*, 36.
26. *Ibid.*, 46, 47.
27. Hanyok and Mowry, *West Wind Clear*.
28. Testimony of Captain Laurence F. Safford, April 29, 1944. *Joint Committee on the Investigation of the Pearl Harbor Attack*, Part 34, "Proceedings of the Hart Inquiry," 393, 394.
29. Friedman Testimony, 35.
30. *Ibid.*, 36.

31. Undated, untitled handwritten notes by Friedman. NSA Friedman Collection. Document A88860. Untitled handwritten notes by Friedman, September 22, 1944. NSA Friedman Collection. Document A488462.
32. Friedman, *Magic*, 49.
33. *Ibid.*, 50, 51.
34. *Ibid.*, 65.
35. *Ibid.*, 59. Friedman's wartime colleague Solomon Kullback agreed, saying 'the cryptanalytic skills that we developed and our capabilities, at least in reading the Japanese material, really went beyond possibly either the appreciation or the expectation of the military intelligence people. They had a wonderful force here, a wonderful tool, but they didn't know how to use it.' NSA Oral History Interview with Solomon Kullback, August 26, 1982 (NSA-OH-17-82), p. 31. Available at <https://www.nsa.gov/news-features/declassified-documents/oral-history-interviews/assets/files/nsa-oh-17-82-kullback.pdf>.
36. Friedman, *Magic*, 59.
37. *Ibid.*, 54, 55, 65.
38. *Ibid.*, 27.
39. *Ibid.*, 61.
40. Friedman, Untitled memorandum to Lieutenant General John A. Samford, March 12, 1957. NSA Friedman Collection. Document A72891.
41. Friedman, Handwritten memorandum of telephone conversations with Samford, May 8, 1957. NSA Friedman Collection. Document A485355.
42. *Ibid.*
43. Brown, Untitled memorandum to Samford, March 28, 1957. NSA Friedman Collection. Document A472891.
44. Letter from William Friedman to Samuel Eliot Morison, November 20, 1961. William F. Friedman Collection. George C. Marshall Foundation Research Library. Correspondence Files. Box 6, Folder 8.
45. John Keegan, *Intelligence in War*.
46. Samuel Eliot Morison, "The Lessons of Pearl Harbor," *Saturday Evening Post*, October 28, 1961. Friedman, "Shakespeare," 410.

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## Notes on contributor

**David Sherman** is Associate Director for Policy and Records at the National Security Agency. The views expressed herein are his own and do not reflect those of the U.S. government and agencies. He extends his appreciation to Jeffrey Kozak of the George C. Marshall Research Library, Rene Stein of the National Cryptologic Museum, and Betsy Rohaly Smoot and David Hatch of the Center for Cryptologic History for their assistance during the preparation of this article.

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