The Early Development of Communications Intelligence

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A Nazi intercept officer traces the development of illegal listening-in in World War I, ascribing to its successes a monstrous influence on the course of world history.

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For three thousand years history has offered examples of great political and military successes due solely to methods of spying on the transmitted thoughts of an opponent. Alexander the Great, Caesar, Cleopatra, Napoleon, and Metternich owed their successes to the extensive use of this kind of spying. But in modern times the invention of the telegraph, telephone, and finally radio communications has enormously increased its possibilities and given birth to organized systems of illegal listening-in, to the intercept services.

France and Austria were the leaders in this field. As early as 1908, during that period of strained relations with Italy, Austria undertook to intercept all Italian radio traffic and began regular cryptanalytic work on it. In 1911 the Austrian service was put to work on military communications, following move by move the Italian campaign against the Turks in Libya. In similar detail it reported the course of the Balkan wars of 1912-13.

France also maintained surveillance of foreign radio traffic but had little

opportunity for practice on military operations before World War I began. Its principal success was in the cryptanalytic field. Having solved the cipher used between Berlin and the German ambassador in Paris, the French read Berlin's telegram transmitting the 1914 declaration of war and so garbled it before delivery that the ambassador could make nothing of it. They gained some time thus while he was asking for repeats.

Elsewhere the British had had some success with cryptanalysis; the Germans had done practically nothing; and the Russians hadn't given intercept a thought. German field regulations did suggest that radio operators might listen in on foreign traffic when they had none of their own, but this suggestion had not been put into practice.

The War in the East

When the war broke out a few German operators began to listen to Russian army traffic for fun, but didn't know what to do with the intercepted messages; there was no regulation covering this point. Radio was still a novel and mysterious thing both in Germany and in Russia. In the Russian army the idea had not even become general that its own radio messages could be heard just as well by the enemy, and on the German side the possibility of formulating tactics on the basis of intercepted enemy traffic had not occurred to middle and lower commands.

In the first month of the war, however, the potential of military intercept was dramatically demonstrated at Tannenberg, where Hindenburg's Eighth Army faced the First and Second Russian Armies. The Russians were using plain-text radio with abandon for operational orders. The chief of the fixed German radio station at Thorn, on his own initiative, began before the battle to monitor the Russian traffic and to supply Hindenburg by motorcycle with copies of intercepted messages. Later in the course of the battle the fixed station at Königsberg and the two heavy stations of the Eighth Army staff joined in the work. The German command learned through dozens of messages the strength and organization of the enemy, his objectives and his immediate plans, and was able to make its own dispositions and adjust its tactics accordingly.

After the war the role played by this intelligence in the Tannenberg victory was minimized. Ludendorff, Hindenburg's chief of staff, acknowledged grudgingly that he " ... had received an intercepted enemy telegram which gave us a clear picture of the enemy's moves for the

following days." Hindenburg himself described the battle in such fashion as to give the impression that he was in the dark about the enemy's objectives and organization. The German Archives publication Der Weltkrieg admits that the German command "was advised of the objectives of the enemy in a way rarely possible in wartime" but insists that "the critical decisions and orders for the battle ... were made independently" of this information.

The general has not yet been born who, after winning a battle, would admit that he had won it thanks to a well-functioning intelligence service. At Tannenberg the contents of the intercepted messages played a decisive role and developments without them would have been entirely different. On the losing side, the Russian General Danilov spoke of an "unpardonable negligence" in the Russian radio service and declared that faulty communications had been the chief reason for the catastrophe.

At any rate, the success at Tannenberg gave a fillip to the German intercept work. Both the fixed stations and the army radio units were instructed to perform intercept duty when not engaged in their own traffic. Channels were set up for forwarding intercepted messages to command headquarters. The Russians were now enciphering their orders, but the Austrian cryptanalytic service was so far advanced that it had solved the Russian cipher by 19 September. The Germans did not begin regular cryptanalysis until the end of 1914.

The Russians used the simple type of cipher, invented by Julius Caesar, which substitutes a group of digits for each letter of the alphabet. This type is solved by knowledge of the relative frequency with which each letter occurs in a given language; in a ciphered German text, for example, the most frequently encountered cipher element will represent the letter e. Another simple system replaces syllables, endings, prefixes and other word elements with cipher; but these elements also occur with regular frequencies in a given language. Similarly full-word substitutions. More complex systems conceal these frequencies by varying the cipher element substituted, by burying the meaningful ciphers among meaningless ones, by transpositions--"box," "comb," "grille," "double box"--by reencipherment with additive sequences of meaningless symbols. All of these can be solved; it is only a question of trying enough alternative possibilities. For the cryptographer the trick is to make the number of alternatives enormous and then to change cipher so often that the cryptanalyst can never catch up with him.

During the German-Austrian operations on the eastern front in late 1914 and 1915 the military intercept service came into its own. Preparation for the joint operations was initiated by a radio deception. Once before, in the late stages of the Battle of Tannenberg, the Germans had tied up Russian reserves on their north flank when preparing to attack on the south by sending a garbled plain-text message referring to the arrival of reinforcements in the northern area. Now, after the Austrian defeat near Lemberg in September, it was necessary to withdraw elements of the German Eighth Army in East Prussia for the formation of a new Ninth Army to support the Austrian front. This weakening of the defense of East Prussia was successfully masked by referring in two garbled plain-text messages to an unloading of reinforcements which implied preparation for a new German offensive in the north.

Meanwhile the Austrians had been heartened to learn from intercepted messages that the Russians, contrary to expectation, did not intend to pursue them beyond the Wisloka, but they were worried by reports of strong enemy cavalry forces between the Nida and the Vistula. The intercept service found, however, that these were only a reconnoitering cavalry corps under General Novikov. At 0840 on 24 September Novikov transmitted a full report on his reconnaissance to the Russian High Command in Warsaw. While the Russians were deciphering this message in Warsaw, Austrian cryptographers were working on the same text, and before noon laid it deciphered before the Austrian High Command. It was probably the first time in the history of warfare that the result of enemy reconnaissance was revealed so swiftly to those against whom it was directed.

In the next few days intercepted messages showed that the Russians were regrouping and shifting their main weight north to the middle reaches of the Vistula. The German-Austrian forces, in an effort to catch the enemy off balance during this regrouping, mounted an offensive which for a time went well. But Russian traffic now betrayed the fact that enormous forces--94 divisions against the German-Austrian 52-- were being assembled for an advance toward the heart of Germany.

The German and Austrian armies withdrew south to a line based on Krakow and the Carpathians. Hindenburg, appointed commander in chief of the forces in the east, ordered the Ninth Army, with all available reinforcements from East Prussia, to undertake an encircling movement on the Russian right flank. The movement began on 13 November. The Russians, their traffic showed, had no idea of the extent to which their

right was threatened, and on 19 November began their general grand offensive. By this time their right wing near Lodz was almost encircled.

At this climactic juncture the German communications intelligence failed. The Russians had captured the German cipher key and deciphered enough messages to know that their own traffic was being read; they now changed their cipher. The German command had for the present to work in the dark. New Russian forces came up from the Warsaw area, and the German divisions which were supposed to encircle the enemy found themselves encircled. In the resulting battle of Lodz the annihilation of the German forces, fighting in ice and snow without any supply, seemed almost certain. Indeed, the Russians had already prepared transports to carry the remnants to captivity.

But the Austrian and German cipher bureaus had been working feverishly, and late on 21 November accomplished the solution of the new Russian cryptographic system. Current Russian messages revealed a relatively weak spot in the ring encircling the German forces; a sector near Brezeziny was held only by cavalry units. General Litzmann undertook to break through this sector, and to everyone's surprise was successful. The German troops escaped, leaving behind only their heavy material. The feat won for General Litzmann the nickname "Lion of Brezeziny"--a captive lion but for the cryptanalyst.

All during 1915, particularly in the German break-through and victorious advance from May to September, the interception of Russian traffic was of decisive importance. All Russian countermeasures were known in advance. Ludendorff had become so accustomed to making his dispositions on the basis of intercept results that he was impatient and nervous if he did not get them. His first question was "Any radiograms?" If no messages of importance were handed him, he used to growl that they had not been paying enough attention and would they kindly do better. If a new cryptographic system was not promptly solved, he called it a "damned mess" and said the cryptanalysts had become "absolutely stupid."

This was the period of glory for the intercept services; it is inconceivable under the strength ratios which obtained that the summer offensive could have succeeded as it did without their intelligence on Russian dispositions. Of course, the Russians were always changing their ciphers, but the Austrian cryptanalysts were so well tuned to the Russian systems that every new key was broken within a few days. And

in this the Russians afforded wonderful assistance: often they sent one and the same message in the old key and the new one; or they would send an inquiry in the old cipher and get the reply in the new one; or they would send messages in plain text referring to encrypted messages.

The consistent German and Austrian anticipation of Russian measures did not escape Russian notice. The cry of "Treason! " ran through all Russia and the Russian army, and a search for traitors began everywhere. Every Russian officer with a German-sounding name was suspect, and many of them were courtmartialled. The fury went to such lengths that finally it had to be stopped by cabinet order of the Czar. The real "traitor" was never found, and in that lay the great tragedy for the Russians; for those summer days of 1915 decided the campaign; and decided it against them. And this defeat was the opening act of the revolution of 1917.

The slowness of the Russians to recognize the insecurity of their communications was amusingly illustrated as late as the spring of 1916. To veil their withdrawal of two corps from the Austrian front they had several stations carry on deceptive plain-text traffic. But they announced this plan in advance in transparent cipher, and prefixed to each of the fake messages the warning "Do not be alarmed; this is just deception."

Blitzkrieg in the West

When the war began the Russian plan on the eastern front and the German plan on the western front both called for what came later to be known as "Blitzkrieg." The Russian armies were to fight decisive battles in East Prussia and then advance quickly on Berlin. In the west the German armies were to dash through Belgium and northern France and deliver a crushing defeat to the French army somewhere east of Paris.

There is a certain irony in the fact that at the very time when the Russians in the east were exposing themselves by clumsy use of radio so disastrously that the course of the Battle of Tannenberg wrecked their entire blitz campaign, the Germans in the west should be making the same mistake with the same result, so that although the war continued for years the fundamental idea had already been hopelessly wrecked. In the east it was the Battle of Tannenberg; in the west it was the Battle of the Marne.

Few battles in military history have had so much written about them as the Battle of the Marne. There are many names for it, of which one of the favorites among the French is "Miracle of the Marne." People have sought and found all sorts of explanations for the seemingly inexplicable bogging down of the German advance, and German Lt. Col. Hentsch has been made a scapegoat for recommending the "unnecessary" retreat. Glimpses into the archives of the French Deuxiè me Bureau provided by Polish Lt. Col. Szieszynski and French Col. Calvel reveal what the "miracle" was.

The invading German forces relied heavily on radio communications but devoted very little effort to making them secure. Every transmitter attached to a particular army had the same initial letter in its call sign, and call signs and frequencies were never changed. Corrections and answers to encrypted messages were often sent in plain text, and frequently the signature of the commander was carried in clear. Occasionally entire messages were sent in plain text.

The French had committed their intercept service in full even before the beginning of the war. By mere checking of call-signs they were able to identify the staff transmitters of the armies, the staff transmitters of most of the cavalry divisions, and the staff transmitters of some of the army corps and infantry divisions. Enciphered messages were all quickly solvable because of references in plain text to their contents. In the course of fourteen days the French service picked up some 350 messages from the cavalry corps under General von der Markwitz alone. These revealed not merely all this corps' movements, plans and deployment, but those of the whole First Army to its north, under von Kluck, and of the Second Army to the south under von Büllow.

The First Army had had to move north to avoid being outflanked by the French Sixth Army, and this had overextended the German line, leaving a gap between the First and Second Armies which von der Markwitz' cavalry corps was trying to fill. The intercepted messages showed where the weak places were, and the French and English broke through the two armies on 8 September, threatening to encircle von Kluck and outflank von Büllow. The Germans had to retreat. Their attempt to gain a quick decision in the west had failed, and in the resulting war of position the eventual superiority of the Allies in material decided the entire campaign.

After the Battle of the Marne the French and Germans continued trying

to outflank each other to the north in the famous "race to the sea." The focus of French reconnaissance lay in the intercept service, whereas the Germans had to rely exclusively on patrols and scouts along the front, who of course were able to make observations only after the enemy units had already been committed. The French service recognized the movement of the German Sixth and Seventh Armies from the southern front to the extreme north and to the Aisne sector respectively. With the help of the British intercept service, which had now become active, it identified the formation of the new German Fourth Army in Belgium and anticipated its 18 October offensive in time for countermeasures which stopped it at the Yser. Then the attempt of the redeployed Sixth Army to break through toward Ypern was prematurely betrayed in radio traffic and failed. These battles ended the war of movement in the west.

Stabilized Fronts and New Devices

Late in 1914, after their experience in the east, the Germans also began systematic interception of enemy radio traffic in the west. Both sides now developed extremely great activity in the invisible struggle between camouflage, concealment, and deception on the one hand and interception, evaluation, and cryptanalysis on the other. Of utmost importance for communications security was attention to details. A German message ordering a change of call signs sometimes gave the old and new signs in parallel. Or when they changed signs German stations might not break the sequence of message numbers. One German divisional transmitter could be recognized by its habit of noting the sending time and word count at the end of the message instead of at the beginning. Another could be identified by its stereotyped greeting, "Can you hear all right?"

The French were also leaders in the field of radiogoniometry, that is transmitter direction finding. The principle is simple enough: the way a directional receiving antenna faces to bring in the strongest signal shows the point of the compass from which the signal comes. The intersection of this directional line with that from another DF receiver is the location of the transmitter. The line from a third DF receiver should theoretically intersect the others at the same point; in practice, it shows the margin of error. There were practical difficulties in correcting for local and magnetic deviations of the radio beam, in placing DF receivers at a sufficiently wide angle for distant direction-finding, and in developing mobile equipment of sufficient accuracy. The British and Italians, as well as the Germans, were well advanced in this field also; the Russians had

not got beyond modest beginnings by the end of the war.

DF operations achieved their greatest importance in the naval intercept service; the sinking of many a German submarine could be credited to the British DF service. But the course of raiding Zeppelins could also be observed by the British DF with great ease because of their low speed, the continuous radio traffic verifying their bearings, and the fact that they used a set frequency and a fixed system of call signs.

As the vulnerability of radio communications became generally recognized and as the war of position on both fronts made possible the establishment of wire networks, the intercept services began to devote most of their effort to tapping telephone lines. Single-conductor telephone lines were still in general use, with the return circuit through the ground. Metal stakes driven into the ground as close as possible to the enemy lines would pick up these ground circuits for monitoring in a dug-out connected by wire to the stakes. One such intercept station might supply as much as twenty pages of significant information a day.

In the east this activity was an important one-sided factor from the summer of 1916 to the end of the war. German and Austrian stations were located at intervals of about ten kilometers along the entire front and could monitor all Russian telephone calls as far as five kilometers behind the front. The strategic exploitation of this source of intelligence was the withdrawal of a large portion of the forces of the Central Powers from the eastern front, since there was now no danger of a surprise move by the enemy. Except for the intercept service it would not have been possible to keep the front stabilized with the remaining forces, whose strength ratio to the enemy was in many sectors no greater than one to ten.

In the west the German and allied intercept services now largely neutralized each other, with advantage to one side or the other depending upon whether the intelligence was properly exploited. On one occasion the Germans, having learned by listening to French artillery telephone calls the hour of a planned French attack, made the mistake of passing the information and appropriate orders to their own units by telephone in plain language. The French in turn heard these calls and made a completely successful attack several hours in advance of the original time.

In the half-year of battles before Verdun in 1916 telephone lines were so

badly damaged by the uninterrupted artillery fire that new methods of communication had to be found. Everywhere along the front they used "ground telegraphy" instruments, which sent buzzer currents short distances through the earth. Nearby interception was easier than for telephone, but units which had been accustomed to intercepting voice now had to learn Morse and sometimes cryptanalysis. The English, on the other hand, invented an apparatus called the Fullerphone, which they considered a secure combat-zone communications device; but even it could be intercepted under certain conditions.

The German intercept service achieved strategic significance only once in the West. It learned of the preparations for the grand Allied offensive on the Somme in the spring of 1917, pinpointing the direction and areas of attack. For once the German supreme command drew the correct conclusions and immediately before the attack ordered a withdrawal to the "Siegfried Line." The target was thus withdrawn from the crushing superiority of the Allies, and the attack petered out in empty space. The Allied intercept services had advance information of this German maneuver, but their command failed to adjust its tactics accordingly.

The German command missed its greatest opportunity during this same spring. The French army in its unsuccessful attack on the Aisne and east of Reims had suffered such severe losses that its morale was badly shaken. Intercepted messages revealed that there was mutiny in numerous army corps, that individual soldiers and whole units were leaving the front or deserting to the enemy. In this situation they could not have resisted a German attack. But the incredible happened: the German command, seeing in this situation a parallel with the Russian front, expected the French power of resistance to collapse without any further German action. It missed the chance which was never to return. While the Germans waited for capitulation Petain resumed command, the crisis came to an end, and the French front stood firm again. The scale of victory now tipped slowly in favor of the Allies.

The War at Sea

The naval intercept war was highly developed from the very beginning. The British and the Germans used cipher and disguise here far more than ashore. A message from a coastal command station intended for a ship at sea would ostensibly be directed to another coastal station while the warship stood by for it on the same wave length.

Through mishap the Germans were long at a disadvantage in this

activity. The Russians had sunk the German cruiser Magdeburg in the Baltic late in 1914. The Germans did not know for years that a Russian diver had recovered the code book from the radio cabin of the sunken vessel. The Russians reconstructed the cipher system and passed it to the British. Consequently, at the Doggerbank in January 1915, the British were able to follow the movements of the German fleet and sink the armored cruiser "Blücher."

The British had also succeeded in solving the German cipher used in submarine traffic, and could follow the movements of the German submarines precisely from day to day. While in Germany people were doubling and tripling security precautions in connection with the movements of submarines in a downright convulsive fear of English spies, the English had only to listen to the radios of the submarines and their command stations. It was only this which made possible the British blockade of the North Sea coast with meager forces.

The Germans were at a disadvantage too in the relative effort they devoted to the naval intercept service. It employed at its height a few dozen cryptanalysts and evaluators under the command of a naval lieutenant, whereas the British Admiralty had several hundred commanded by an admiral, handling an average of 2,000 messages daily. The British were the first to create a technically exact and fast working system of evaluation. Their DF stations were connected with each other and with the central office by teletype. Every reading was promptly registered at the central office on a great orientation map. All intercepted call signs were carded and systematized, so that the British were able to determine the pattern according to which the German call signs were changed and so to know in advance what sign a particular German transmitter would be using today or tomorrow or next week. The Germans never achieved, even during World War II, such well organized collaboration among direction finding, decipherment, and evaluation. People never got away from petty preoccupation with their own interests and rivalry with other units.

Nevertheless there were some German successes. Von Spee's cruiser squadron had been pursued into the Pacific by superior Allied naval forces. In their search for him the English used their radios with unconcern, with the result that he was always posted on the movements of the enemy. On the other hand, he was able to mislead his pursuers by radio silence and occasional deceptive traffic from the little cruiser "Emden" in Australian waters. His appearance at Coronel in

Chilean waters came as a complete surprise to Admiral Cradock, who supposed him far away toward Australia. The German warships struck so unexpectedly that the British armored cruisers "Good Hope" and "Monmouth" were quickly sunk, and several other units were badly damaged. Allied shipping in this area was almost completely paralyzed for a number of weeks.

The Diplomatic Front

Better known are the intercept activities on the diplomatic front during World War I. Both the German and the Austrian diplomatic ciphers were compromised, not through cryptanalysis but by traditional cloak-and-dagger methods.

One Alexander Czek, a Belgian resident of Austrian and English parentage, was employed at the heavy German radio station in Brussels, one of the direct links for traffic from the Foreign Office in Berlin. He began as a technician, but was so capable and conscientious that he was soon entrusted with operations and later came to be called on as an extra in the cipher office. In the summer of 1915 the British Intelligence Service began to work on him with the help of a young lady of the Belgian liberation movement. He was finally persuaded that it was his duty to work not for the Germans but for the Allies. He was unable to make off with the radio station's code book, but saved the work-sheets he used when called in for decoding. By the time he became suspect to the Germans, having been seen in company with members of the liberation movement, he had enough of these work-sheets to reconstruct the cipher. He escaped across the border and turned them over to the British. It did not occur to the Germans to change their cipher, and the messages from the German Foreign Office could be read in London from about the end of 1915 on.

The most famous use of this source of intelligence was to expose publicly the negotiations early in 1917 for an alliance of Mexico and Japan with Germany, an exposure which helped precipitate the entry of the United States into the war. In mid-January the German Foreign Minister, Zimmermann, sent a message with instructions to undertake such negotiations to his Ambassador in Mexico, offering to Mexico the inducement of repossessing its lost territories in Texas, New Mexico and Arizona. The message was transmitted enciphered through three separate channels to the German ambassador in Washington for forwarding to Mexico City: by radio via New York, by radio via Stockholm

and Buenos Aires, and by cable via London, appended through trickery to a cable of the American Ambassador in Berlin. At the Berlin Foreign Office they thought themselves pretty sly to have devised this last method.

All three messages were intercepted and read in London. The United States must be informed, but the source could not be revealed. The British therefore ordered a fourth copy of the message obtained in Mexico, and when it arrived after five weeks showed it with the translation to the American Ambassador in London, acknowledging only that they had come into possession of a cipher key. President Wilson was not convinced of the authenticity of the message until the British agreed to redecipher it in the presence of an American representative.

On 1 March the President made the message public, giving out that it had somehow been obtained in Mexico. There was a storm of indignation in the United States and one of apprehension in Germany and Mexico. Von Eckhardt, the German Ambassador in Mexico, cabled on 2 March in the same code: *... This was not revealed by me here. Treachery or indiscretion must have occurred in the United States ...*

The exchange of messages seeking to fix responsibility lasted through March, with von Eckhardt suggesting again that secret messages were carelessly handled in Washington; and Berlin was finally convinced of his innocence. But traffic continued in this code to the end of the war. The Germans retained the firm conviction that ciphers of other nations were capable of solution but not their own.

It was perfectly marvelous how the British intercept service was able during the entire war to keep its work so secret that not the slightest hint about it reached the outside. It even went so far in camouflaging its work that it had inserted in the British press violent attacks on the antiquated methods of the Secret Service, to which it belonged. The press articles pointed to the American intelligence service as much more thorough and efficient, lamenting the fact that the Zimmermann affair had been uncovered in Washington rather than in London. The Austrian aristocrat whose son had made all this possible tried to find him after the war. He applied to the British Secret Service and received the following reply from its chief:

... I must inform you this is the first time I have ever encountered the name Alex Czek ... I cannot tell you anything whatsoever regarding your son. ...

The Austrian diplomatic code was betrayed similarly, if with less dramatic results. Count Czernin, the Austrian ambassador in Bucharest, was a diplomat of the old school, a cavalier who not only knew his job but also knew how to live agreeably. Once when spending an hour with a lady of his acquaintance he left his briefcase, containing among other things the cipher he used for dispatches to Berlin, in his cab outside. Unfortunately the driver also found it necessary to leave the cab for a time, and when the Count returned the briefcase was gone.

Conscientiously Count Czernin informed Vienna and offered his resignation. Emperor Franz Joseph in his courteous fashion declined to accept it, calling the matter a regrettable oversight; no real damage was done, since the Rumanian police found and returned the briefcase with contents intact after three days. In Vienna it never occurred to anyone to change the cryptographic system. Not until 1917, when the Austrians occupied Bucharest and found the photographic negatives of Count Czernin's documents in the Prime Minister's attic, did they realize that the Rumanians and their Allies had been reading Foreign Office traffic since the war began.

It seems almost incredible that the two powers which developed the intercept service to a high degree of perfection during the war and whose military operations were based to a very great extent on its results, which therefore knew very well how vulnerable the communications of a country are to penetration by the enemy, should have displayed such utter unconcern about the security of their own communications.

You might think that possession of this cipher would have given the Rumanians more advantage in the four-month German-Austrian blitzkrieg against them. Actually it only made them overconfident, feeling that the collapse of Austria was imminent. In the military operations the Rumanians used their radios in a way that paled even the Russian practices at Tannenberg. The German and Austrian intercept services were overwhelmed by the flood of intercepted messages. The strength, organization and all the intentions of the Rumanian forces were written clear for the enemy to read. General Falkenhayn crushed them in one swift battle after another.

The Rumanians, like the Russians two years before, were convinced that treachery was involved. They replaced men in various positions and court-martialled a number of high officers, but for the most part did not

change their radio practices. They did get the French military mission to help them set up a new cryptographic system, but this was broken in six days by two German cryptanalysts who had worked on French systems before. If the lightning defeat of the Rumanians was a "judgment of God," as they used to say in Germany and Austria, for their perfidious declaration of war, we can see here what divine instrument was used in execution.

The Peace Negotiations

The intercept services continued to play their decisive role even at the peace conferences. At the Allied headquarters in the Forest of Compiegne the French Deuxiè me Bureau deciphered all the telegraphic traffic of the German delegation, even the famous instruction to "Try for milder terms; if not obtainable, sign nevertheless." All the German cards were on the table.

Earlier, at Brest-Litovsk, the German and Austrian delegations had the benefit of three intercept sources. A large radio intercept center was set up to monitor traffic inside Russia. The teleprinter put at the disposal of the Russian delegation for communications with Moscow was tapped, and the fifteen cryptanalysts assigned had broken the Russian cipher by the third day of negotiations. And microphones were concealed in the chandelier of the Russian conference room and in the walls of the living rooms of all the Russian delegates. The Russians changed cipher once, after the negotiator for the Central Powers seemed to know so much that they became suspicious, but the new code was broken in six days. Thus at this conference it was the Russians who found their hands hopelessly exposed.

Posted: May 08, 2007 07:18 AM